

Final Environmental Impact Report

Santa Felicia Dam Safety Improvement Project



February 2019

Prepared by:



UNITED WATER CONSERVATION DISTRICT
"Conserving Water Since 1927"

with Technical Assistance from
Catalyst Environmental Solutions Corporation
and Cardno, Inc.

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Appendices

Appendix A	Summary of Air Quality Emissions Data
Appendix B	Summary of Special Status Species Information
Appendix C	Summary of Greenhouse Gas Emissions Data
Appendix D	<u>DEIR Public Comments and Responses</u>

Acronyms

ADT	Average Daily Traffic
APE	Area of Potential Effects
AQMP	Air Quality Management Plan
BACT	Best Available Control Technology
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMPs	Best Management Practices
BOC	Board of Consultants
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Cal/OSHA	California Occupational Health and Safety Administration
CalEEMod	California Emissions Estimator Model
CALFIRE	California Department of Forestry and Fire Protection
CalTrans	California Department of Transportation
CARB	California Air Resources Board
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFP	California fully protected
Cfs	Cubic feet per second
CH ₄	Methane
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CNPS	Native Plant Society
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CO _{2e}	Carbon Dioxide Equivalent
CRHR	California Register of Historic Resources
CRPR	California Rare Plant Rank
CSSC	California Species of Special Concern
CTR	California Toxics Rule
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
dB	Decibel
dBA	A-weighted scale

DO	Dissolved oxygen
DPM	diesel particulate matter
DSOD	California Department of Water Resources Division of Safety of Dams
DTSC	California Department of Toxic Substance Control
DWR	California Department of Water Resources
EC	Electrical Conductivity
EIR	Environmental Impact Report
ESA	Federal Endangered Species Act
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FGC	Fish and Game Code
FHSZ	Fire Hazard Severity Zone
FHWA	Federal Highway Administration
FIRMs	Flood Insurance Rate Maps
FMMP	Farmland Mapping and Monitoring Program
FPPA	Farmland Protection Policy Act
FPSTP	Fish Passage Science and Technology Panel
FTA	Federal Transit Administration
GHG	Greenhouse Gas
HCP	Habitat conservation plan
HDPE	High Density Polyethylene
HIP	Habitat improvement plan
HMPBs	Hazardous Materials Business Plan
HMR	Hydrometeorological Report
HUD	U.S. Department of Housing and Urban Development
Hz	Hertz
IAMP	Implementation and Adaptive Management Process
IDF	Inflow design flood
IPM	Integrated Pest Management
kW	Kilowatt
LARWQCB	Los Angeles Regional Water Quality Control Board
LOS	Level of Service
LUST	Leaking Underground Storage Tank
MBTA	Migratory Bird Treaty Act
MCE	Maximum Credible Earthquake
MLD	Most Likely Descendent
MOA	Memorandum of Agreement

mph	Miles Per Hour
MSE	Mechanically Stabilized Earthfill
msl	Mean Sea Level
N ₂ O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NISC	National Invasive Species Council
NMFS	National Marine Fisheries Service
NO ₂	Nitrogen Dioxide
NOAA	National Oceanic and Atmospheric Administration
NOP	Notice of Preparation
NO _x	Oxides Of Nitrogen
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NWS	National Weather Service
O ₃	Ozone
OES	VCSO Office of Emergency Services
OHWM	Ordinary High Water Mark
OSHA	Occupational Safety and Health Administration
PA	Programmatic Agreement
PCBs	Polychlorinated Biphenyls
PCEV	Passenger Car Equivalent Vehicle
PERP	Portable Equipment Registration Program
PGA	Peak Ground Acceleration
PM ₁₀	Particulate Matter (Fine Dusts And Aerosols) Ten Microns or Smaller In Aerodynamic Diameter
PM _{2.5}	Particulate Matter (Fine Dusts And Aerosols) 2.5 Microns or Smaller In Aerodynamic Diameter
PMF	Probably Maximum Flood
PMP	Probable Maximum Precipitation
PPV	Peak particle velocity
PRC	Public Resources Code
RCRA	Resource Conservation and Recovery Act
ROC	Reactive Organic Compounds
ROI	Region of Influence

RPA	Reasonable And Prudent Alternative
RWQCB	Regional Water Quality Control Board
SCAQMD	South Coast Air Quality Management District
SCCAB	South Central Coast Air Basin
SCCIC	South Central Coastal Information Center
SEMS	Standardized Emergency Management System
SF ₆	sulfur hexafluoride
SHPO	State Historic Preservation Office
SO ₂	Sulfur dioxide
SOAR	Save Open-Space and Agricultural Resources
SPCC	Spill Prevention, Control, and Countermeasure Rule
SWP	California State Water Project
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TACs	Toxic Air Contaminants
TDS	Total Dissolved Solids
THPO	Tribal Historic Preservation Office
TMDL	Total Maximum Daily Load
TSCA	Toxic Substances Control Act
UCMP	University of California Museum of Paleontology
USACE	US Army Corps of Engineers
USDA-FS	U.S. Department of Agriculture Forest Service
USEPA	US Environmental Protection Agency
USFWS	US Fish & Wildlife Service
USGS	U.S. Geological Survey
UWCD	United Water Conservation District
VCAPCD	Ventura County Air Pollution Control District
VCAQAG	Ventura County Air Quality Assessment Guidelines
VCFD	Ventura County Fire Department
VCISO	Ventura County Sheriff's Office
VCWPD	Ventura County Watershed Protection District
WDR	Waste Discharge Requirements
WEAP	Worker Environmental Awareness Program

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Executive Summary

Introduction

United Water Conservation District (UWCD) proposes the Santa Felicia Dam Safety Improvement Project (Project) to address two primary safety-related components of the dam: 1) replace the existing outlet works due to the potential for failure under seismic loading conditions and impacts associated with sedimentation near the intake tower; and, 2) increase the conveyance capacity of the existing spillway to sufficiently pass the Inflow Design Flood (IDF), which for the Santa Felicia Dam consists of the Probable Maximum Flood (PMF) of 220,000 cubic feet per second (cfs).

Project Location

The Project is located approximately 4.5 miles northeast of the unincorporated town of Piru in Ventura County, California. The Project site is accessed from Piru Canyon Road via State Route 126. The Project location is shown in Figure ES-1.

Project Objectives

CEQA Guidelines Section 15124(b) require the project description to include a statement of objectives for the proposed project, including the underlying purpose of the proposed project. Compatibility with project objectives is one criterion for selecting a range of reasonable project alternatives and provides a standard against which to measure project alternatives.

The objective of the Project is to improve the safety of Santa Felicia Dam. Improvements are required both to ensure that the outlet works can withstand loading from the Maximum Credible Earthquake (MCE), and that the spillway can safely convey the outflow from the regulatory IDF. In addition, intake improvements are needed to mitigate the accumulation of sediment in the reservoir which is projected to reach the inlet of the intake tower sometime between 2023 and 2025. If sediment accumulates to the crest of and/or above the inlet of the intake tower, then UWCD may lose the ability to control water releases from the dam.

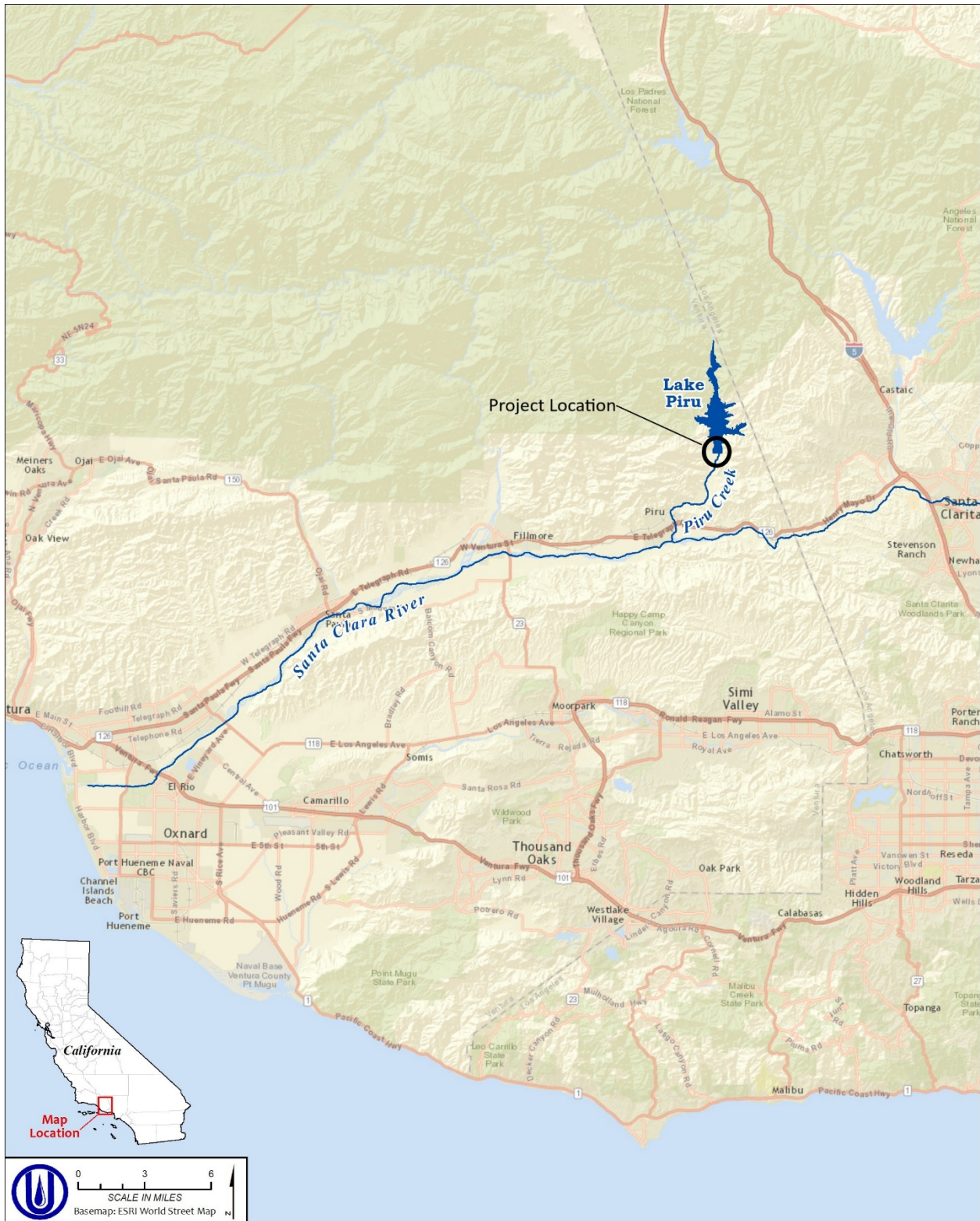


Figure ES-1 Project Location Map

Project Overview

The Project consists of two components. The first component would replace the existing outlet works system to address the potential for failure under seismic loading conditions and impacts associated with sedimentation near the existing intake tower. Replacement of the outlet works would also include installation of a new hydroelectric turbine. The second component would increase the conveyance capacity of the existing spillway to sufficiently pass the IDF, which for the Santa Felicia Dam consists of the PMF of 220,000 cfs. The Project does not include an increase in the capacity of the reservoir nor does it propose any changes to the current operations or flow releases from the dam.

Project Component 1: Outlet Works System

The proposed new outlet works system consists of four main facilities based on their function and general location: 1) an intake facility in the reservoir; 2) a water transmission conduit in a tunnel through the left (east) abutment of the dam; 3) downstream control facilities to route flows into lower Piru Creek; and, 4) a new hydroelectric plant. An initial feasibility study for the Project evaluated various tunnel alignments through each abutment as well as various options for intake facilities and downstream control facilities (GEI 2015a). Based on the results of the feasibility study, UWCD proposes to construct a completely new outlet works system through the east abutment of the dam (left side when looking downstream from Lake Piru Reservoir). The intake structure would be located on the left (east) side of the dam and consist of either a sloping intake structure or an intake tower. The Project would include the installation of a 78-inch diameter steel conduit and a 24-inch diameter low-flow steel conduit to convey flows from the base of the intake structure to the downstream control facilities. These conduits would be installed in a tunnel that would be constructed through the left (east) abutment of the dam. The larger magnitude water releases would be conveyed through the 78-inch diameter conduit and smaller magnitude water releases would be conveyed through the 24-inch diameter conduit. The Project would include the construction of new downstream control facilities on the left (east) side of the dam, immediately downstream of the toe berm. The downstream control facilities would include a primary discharge system to release conservation, migration, and emergency release flows and a low-flow bypass system to release minimum habitat and alternative operational flows. The facilities would also include a new hydroelectric plant. The final design and construction of the facilities would be selected based on the results of site-specific geotechnical investigations and detailed hydraulic and structural analyses as the Project approaches final design. Construction of this component of the Project is estimated to require approximately 24 months (sloped intake option) or 36 months (intake tower option). During construction, the water level in Lake Piru Reservoir would be lowered to 950 feet msl or lower to access the intake construction area, and the existing outlet works would be used to maintain mandated water releases to lower Piru Creek. Following completion of construction, the existing outlet works would be abandoned and flow releases would be conveyed to lower Piru Creek through the new outlet works system.

Project Component 2: Increase Spillway Capacity

The purpose of the spillway is to provide for the safe release of floodwaters once the reservoir is at its capacity, thus preventing flows from overtopping the dam. The existing spillway is located immediately west of the dam (adjacent to the right abutment when looking downstream from Lake Piru Reservoir) within a natural topographic feature that was modified during construction by excavation into bedrock to accommodate the crest structure and spillway chute. The spillway consists of an ungated ogee crest¹ and a funnel-shaped reinforced concrete chute. Downstream of the chute, an unlined rock discharge channel

¹ An ogee spillway forms a part of the dam itself and has control structures that consist of ogee-shaped crests (crests that are S-shaped when viewed in profile in profile)

conveys flows to its confluence with lower Piru Creek, approximately 0.7 mile downstream of the Santa Felicia Dam outlet works facilities.

The current spillway capacity was designed to comply with applicable design criteria at the time of construction. Santa Felicia Dam was designed to pass a maximum flood of 105,000 cfs with 5 feet of freeboard below the dam crest elevation of 1,075 feet msl. In 2013, a California Department of Water Resources Division of Safety of Dams (DSOD) analysis indicated an IDF of 220,000 cfs for Santa Felicia Dam. This value was subsequently confirmed by UWCD in 2015. The Federal Energy Regulatory Commission (FERC) accepted this as the minimal level of risk reduction. UWCD is proposing to increase the spillway capacity through a combination of raising the dam crest and either widening the spillway chute or lowering the spillway floor while retaining the existing ogee crest. The dam crest would be raised 6.5 feet to an elevation of 1,081.5 feet msl using mechanically stabilized earthfill (MSE). The final construction footprint for both options may change slightly during final design; the environmental analysis is intended to consider the maximum extent of construction impact in order to bound the potential effects. The spillway will be widened, deepened or a combination of both. The final design will be chosen based on topographic surveys, geotechnical investigations, hydraulic analyses, and structural investigations. During construction of any option, the water level in Lake Piru Reservoir would be lowered below minimum pool to access the construction area and reduce the risk of spillway discharges and damage to the work in progress. The spillway modifications would be constructed after the new outlet works facilities are in operation on the left (east) abutment of the dam. The new outlet works facilities will be used to maintain mandated water releases to lower Piru Creek and manage reservoir levels, thereby reducing the risk of flooding of the spillway construction area. Construction of this component of the Project component is anticipated to take 24 months.

Environmental Review Process

The Project involves a discretionary action by UWCD and, therefore, it is subject to the provisions of the California Environmental Quality Act (CEQA). This Environmental Impact Report (EIR) has been prepared in conformance with CEQA (Public Resources Code Section 21000 et seq.) and the State CEQA Guidelines (Title 14, California Code of Regulations, Section 15000 et seq.). The purpose of this document is to inform governmental decision makers and the public about the potential significant environmental effects associated with the Project.

This EIR is released in draft form (Draft EIR) for a 45-day public review period. Public meetings will be held to solicit additional input from interested parties on the content and conclusions reached in the Draft EIR. All comments received on the Draft EIR during the public review period will be addressed in the Final EIR. The Final EIR will include comments and responses, as well as any changes to the text, maps, exhibits, or other graphics of the EIR. As Lead Agency, UWCD's Board of Directors (Board) will then consider certification of the EIR and, subsequently, UWCD's Board will consider whether to approve the Project.

The primary function of the Santa Felicia Dam and its reservoir, Lake Piru, is to provide water for recharge of the collective groundwater basins within UWCD's service area. In addition to water storage and conveyance, Santa Felicia Dam provides hydroelectric power generation and is, therefore, regulated by a license issued by FERC under the Federal Powers Act (FERC License No. 2153). After the EIR is certified, FERC will conduct a separate environmental review in accordance with the National Environmental Policy Act (NEPA) to evaluate potential environmental impacts associated with issuance of the amendment to UWCD's FERC license, which is required prior to implementation of the Project.

Purpose and Use of the EIR

As described in CEQA Guidelines Section 15121(a), an EIR is a public information document that assesses potential environmental impacts of a proposed project and identifies mitigation measures and

alternatives to the project that could reduce or avoid adverse environmental impacts. It is not the purpose of the EIR to recommend either approval or denial of a project. Rather, the EIR serves to provide full disclosure of potential environmental impacts of the proposed Project for UWCD's Board review and consideration.

Lead Agency

The lead agency is the public agency that has the greatest responsibility for carrying out or approving a project which may have a significant effect upon the environment (Public Resources Code Section 21067). For this Project, UWCD is the lead agency for CEQA.

UWCD is a water conservation district, established in accordance with California Water Code Section 74000 et seq. UWCD's mission is to manage, protect, conserve, and enhance the water resources of the Santa Clara River, its tributaries, and associated aquifers in the most cost-effective and environmentally balanced manner. Its statutory powers include the ability to conduct water resource investigations, acquire water rights, build facilities to store and recharge groundwater, construct wells and pipelines for water deliveries, commence actions involving water rights and water use, prevent interference with or diminution of river flows and associated natural subterranean supply of water, and to acquire and operate recreational facilities. UWCD is composed of seven geographic divisions and is governed by a seven-person board of directors elected by division. UWCD's revenues include groundwater extraction (pump) charges, in-lieu water delivery charges, ad valorem property taxes, property tax assessments, and recreation fees.

Required Permits and Consultations

The Project does not include any changes to current operations. However, design and construction of the Project will have regulatory and permitting compliance requirements as described in the following sections.

Dam Safety Compliance

Santa Felicia Dam is under the regulatory authority of the DSOD at the state level and FERC at the federal level for dam safety issues. Both agencies will review and approve the analyses, designs, plans, and specifications for construction of the new outlet works and spillway improvements. UWCD has empaneled an independent Board of Consultants (BOC) to assist in the development of the Project design and support DSOD and FERC in the design review process. The engagement and interactions between UWCD, DSOD, FERC, and the BOC follow a prescribed, structured regulatory process.

Federal Approvals

UWCD has a license issued by FERC for the Santa Felicia Dam Hydroelectric Project (FERC License No. 2153-CA). A license amendment is required to implement the Project due to modifications of the dam and hydroelectric plant. FERC will conduct a separate NEPA review for issuance of a license amendment after this EIR is completed and certified.

In addition to FERC's role in the license amendment process, FERC also monitors compliance with license conditions that were part of the Santa Felicia Dam Hydroelectric Project license renewal in 2008, and conditions contained within the Biological Opinion for the license renewal which resulted from FERC's consultation the National Marine Fisheries Service (NMFS) under Section 7 of the federal Endangered Species Act (ESA). These conditions include ongoing work that is relevant to the Project. Compliance actions associated with these license conditions have already commenced and the Project is designed to allow those compliance processes to continue. One compliance matter that is relevant to this Project relates to fish passage around/over Santa Felicia Dam. A feasibility study of upstream and downstream fish passage for endangered southern California steelhead (*Oncorhynchus mykiss*) was conducted in 2015 to comply with the requirements of the Biological Opinion issued by the NMFS on May 5, 2008. The study

was conducted by the Santa Felicia Dam Fish Passage Panel, an independent panel of fish passage experts that was established in 2013. The panel's recommendations are currently being implemented in coordination with FERC and NMFS through a separate, independent process.

Another ongoing compliance matter is the development of a Habitat Improvement Plan (HIP) to address and minimize the geomorphic effects of the Santa Felicia Dam and its operations on the quality and quantity of habitat for southern California steelhead in lower Piru Creek downstream of Santa Felicia Dam. This plan is also being developed to comply with the requirements of the Biological Opinion issued by NMFS on May 5, 2008. The most recent draft of the HIP was submitted to NMFS in November 2017, and FERC in February 2018. Development of the HIP is being conducted in coordination with FERC and NMFS through a separate, independent process.

A Clean Water Act (CWA) Section 404 permit from the United States Army Corps of Engineers (USACE) would be required for dredge and fill operations in wetlands or other jurisdictional waters of the United States that are necessary to implement the Project.

Consultation with the US Fish & Wildlife Service (USFWS) and NMFS pursuant to Section 7 of the ESA is required to address potential effects to federally-listed species. FERC will be the Lead Federal Agency for Section 7 consultation, and UWCD is their non-federal designee for informal consultation with the USFWS and NMFS.

Consultation with the State Historic Preservation Office (SHPO) pursuant to Section 106 of the National Historic Preservation Act (NHPA) is required to address cultural resources requirements. FERC will be the Lead Federal Agency for the Section 106 consultation, and UWCD is their non-federal designee to coordinate the process.

State and Local Approvals

The DSOD will review an Application for Repair and ensure that all dam safety related issues are addressed to their satisfaction.

If the Project is approved, UWCD would need to obtain a CWA Section 401 Water Quality Certification from the State Water Resources Control Board (SWRCB) for potential water quality effects to state water that would result from fill and dredge operations necessary to implement the Project.

UWCD would also need to obtain coverage under the National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit in compliance with Section 402 of the Clean Water Act from the Los Angeles Regional Water Quality Control Board (LARWQCB).

In addition, UWCD would comply with Section 1600 of the Fish and Game Code (FGC) and would need to obtain a Lake and Streambed Alteration Agreement from the California Department of Fish and Wildlife (CDFW) for modifications to state waters. UWCD would also comply with the California Endangered Species Act (CESA) Section 2080.1 (dual State and Federally-listed species) and, if required, consult with the CDFW to obtain a California incidental take permit.

Lastly, the construction of the tunnel portion of the Project would require compliance with California Division of Occupational Safety and Health (Cal/OSHA) health and safety requirements. In addition, if construction of the tunnel necessitates the use of a diesel generator in the tunnel, then an Underground Diesel Permit would be required from Cal/OSHA.

Summary of Environmental Impacts and Mitigation Measures

As described in the EIR, under implementation of the proposed Project, no impacts would occur to agricultural resources, land use and planning, mineral resources, tribal cultural resources, and utilities and service systems, and the majority of impacts identified would be less than significant or are able to be mitigated to less than significant levels. Only those impacts described below could not be feasibly

mitigated to a less than significant level and would remain as potentially significant and unavoidable adverse impacts.

Noise

- > Project construction would temporarily expose persons to, or generate, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- > Project construction would cause substantial temporary or periodic increases in ambient noise levels in the Project vicinity above levels existing without the Project.

Recreation

- > Project construction would alter recreational access for boating.
- > Project construction could reduce the quality of recreational experiences.

Alternatives to the Proposed Project

One of the most important aspects of the environmental review process is the identification and assessment of reasonable alternatives that have the potential for avoiding or minimizing the impacts of a proposed Project. In addition to mandating consideration of the No Project Alternative, the CEQA Guidelines (Section 15126.6(d)) emphasize the selection of a reasonable range of feasible alternatives and adequate assessment of these alternatives to allow for a comparative analysis for consideration by decision-makers.

A screening-level analysis was conducted to identify a reasonable range of alternatives to analyze at an equivalent level of detail to the Project in the EIR. Based on the results of this analysis, two alternatives were retained for analysis as project alternatives and carried forward for analysis in this EIR.

Alternative 2: Replace Existing Spillway Crest with Labyrinth Crest and Modify Chute

Under this alternative, the existing spillway crest would be replaced with a labyrinth crest structure² and the existing spillway chute would be widened and/or deepened to provide the required flood discharge capacity for the IDF. This alternative would involve demolition of the existing service spillway crest structure and portions of the existing chute and spillway walls, followed by construction of a widened and/or deepened spillway with a 6-cycle labyrinth crest structure. The overall labyrinth width would be approximately 330 feet with a crest elevation at 1,055 feet msl. This configuration would route the IDF with the reservoir reaching a maximum level at approximately 1,073.5 feet msl. The dam crest would remain at 1,075 feet msl (1,078 feet msl at the top of the existing parapet wall).

The labyrinth weir walls would be 16-feet high and the total length of wall for each labyrinth cycle would be approximately 368 feet. The width of the labyrinth crest normal to the flow direction would be 185 feet. The labyrinth structure itself has an estimated concrete volume of 11,000 cubic yards, excluding requirements for the chute modifications to provide the required discharge capacity. Construction requirements for the chute widening option (Alternative 2A) and the chute deepening option (Alternative 2B) would be similar to the requirements provided for the Project in Section 3, including demolition, concrete placement, excavation, and spillway bridge modifications.

An advantage of this alternative in comparison to the Project is that the dam crest would not need to be raised. However, this alternative would involve significantly more demolition and concrete placement and

² A labyrinth crest structure is a structure that lengthens the flow path by using a zig-zag design to convey large flows at low heads by increasing the effective length of the crest with respect to the channel breadth.

would expose the public to elevated flood risk during construction as the existing ogee crest of the spillway would not be functional during this period.

Alternative 3: No Project Alternative

In addition to the Project and Alternative 2 (Replace Existing Spillway Crest and Modify Chute with Labyrinth Crest), UWCD considers the No Project Alternative in this EIR. UWCD has three courses of action: (1) approve the Project with or without conditions; (2) deny the Project; or (3) postpone the Project pending further study by denying the Project without prejudice. The No Project Alternative would be the effects of denial or postponement of the Project.

If the Project is postponed or denied, none of the potential environmental impacts identified in this EIR would occur. However, the objectives of the Project would not be met. Specifically, this means that the safety of Santa Felicia Dam would not be improved. The outlet works may not be able to withstand loading from the MCE, and the spillway may not be able to safely convey the regulatory IDF. In addition, intake improvements needed to mitigate the accumulation of sediment in the reservoir would not be made, making the existing intake tower inoperative (with an expectation of occurrence between 2023 and 2025). If sediment accumulates to the crest of and/or above the inlet of the intake tower, then UWCD may lose the ability to control water releases from the dam.

Comparison of Alternatives

A comparative summary of the potential impacts under each alternative is provided in Table ES-1.

Environmentally Superior Alternative

The State CEQA Guidelines (Section 15126.6(d)) require that an EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed Project. The Guidelines (Section 15126.6 (e)(2)) further state, in part, that “*If the environmentally superior alternative is the “No Project” alternative, the EIR would also identify an environmentally superior alternative among the other alternatives*”. Based on the analysis provided in this EIR, UWCD has determined that the proposed Project is the environmentally superior alternative.

Table ES-1 Summary of Project and Alternative Environmental Impacts and Mitigation Measures

Impact	Proposed Project	Labyrinth Alternative (Alternative 2)	No Project Alternative (Alternative 3)	Mitigation Measures
Aesthetics				
Impact AES-1: The Project could have a substantial adverse effect on a scenic vista.	Construction – L/Operation – L	Construction – L/Operation – L	Operation – O	None required
Impact AES-2: The Project could substantially degrade the existing visual character or quality of the site and its surroundings.	Construction – L/Operation – L	Construction – L/Operation – L	Operation – O	None required
Impact AES-3: The Project would create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.	Construction – L/Operation – O	Construction – L/Operation – O	Operation – O	None required
Project construction and operation would not create substantial damage to scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway.	Construction – O/Operation – O	Construction – O/Operation – O	Operation – O	None required
Agricultural Resources				
The Project would not 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?	Construction – O/Operation – O	Construction – O/Operation – O	Operation – O	None required
The Project would not conflict with existing zoning for agricultural use, or a Williamson Act Contract.	Construction – O/Operation – O	Construction – O/Operation – O	Operation – O	None required
The Project would not conflict with existing zoning for or cause rezoning of, forest land (as defined in Public Resources Code Section 4526), or zoned timberland production (as defined by Government Code Section 51104[g]).	Construction – O/Operation – O	Construction – O/Operation – O	Operation – O	None required
The Project would not result in the loss of forest land or the conversion of forest land to a non-forest use.	Construction – O/Operation – O	Construction – O/Operation – O	Operation – O	None required
The Project would not involve other changes in the existing environment that, due to their location or	Construction – O/Operation – O	Construction – O/Operation – O	Operation – O	None required

Impact	Proposed Project	Labyrinth Alternative (Alternative 2)	No Project Alternative (Alternative 3)	Mitigation Measures
nature, may result in conversion of farmland to non-agricultural use.				
Air Quality				
Impact AQ-1: The Project's ozone precursor emissions would not contribute substantially to an existing air quality violation.	Construction – S/Operation – O	Construction – S/Operation – O	Operation - O	MM AQ-1: Implement ROC and NO _x construction mitigation measures
Impact AQ-2: The Project's PM ₁₀ emissions would not contribute substantially to an existing air quality violation.	Construction – S/Operation – O	Construction – S/Operation – O	Operation - O	MM AQ-2: Prepare and implement a fugitive dust control plan.
Impact AQ-3: The Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment.	Construction – L/Operation – O	Construction – L/Operation – O	Operation - O	None required
Impact AQ-4: The Project would not expose sensitive receptors to substantial pollutant concentrations.	Construction – L/Operation – O	Construction – L/Operation – O	Operation - O	None required
Impact AQ-5: The Project would not create objectionable odors affecting a substantial number of people.	Construction – L/Operation – O	Construction – L/Operation – O	Operation - O	None required
The Project would not conflict with or obstruct the applicable air quality plan.	Construction – O/Operation – O	Construction – O/Operation – O	Operation – O	None required
Biological Resources				
Impact BIO-1: The Project would adversely affect individual special-status plant species.	Construction – S/Operation – O	Construction – S/Operation – O	Operation – O	MM BIO-1: Conduct pre-construction vegetation surveys MM BIO-2: Identify and implement BMPs
Impact BIO-2: The Project would cause a temporary disturbance or permanent loss of riparian and other sensitive native plant communities.	Construction – S/Operation – O	Construction – S/Operation – O	Operation – O	MM BIO-1: Conduct pre-construction vegetation surveys MM BIO-2: Identify and implement BMPs MM BIO-3: Prepare and implement vegetation restoration plan MM BIO-4: Design and construct a geomorphically stable channel

Impact	Proposed Project	Labyrinth Alternative (Alternative 2)	No Project Alternative (Alternative 3)	Mitigation Measures
Impact BIO-3: The Project would result in temporary disturbance to terrestrial special-status migratory, and nesting birds.	Construction – S/Operation – O	Construction – S/Operation – O	Operation – O	MM BIO-1: Conduct pre-construction vegetation surveys MM BIO-2: Identify and implement BMPs MM BIO-3: Prepare and implement vegetation restoration plan MM BIO-4: Design and construct a geomorphically stable channel MM BIO-5: Implement nesting bird protections
Impact BIO-4: The Project would result in temporary disturbance to special-status mammals.	Construction – L/Operation – O	Construction – L/Operation – O	Operation – O	None required
Impact BIO-5: The Project would result in disturbance to special-status amphibians and reptiles.	Construction – S/Operation – O	Construction – S/Operation – O	Operation – O	MM BIO-2: Identify and implement BMPs MM BIO-3: Prepare and implement vegetation restoration plan MM BIO-4: Design and construct a geomorphically stable channel <u>MM BIO-6: Conduct pre-construction amphibian and reptile surveys</u> MM BIO-7: Species relocation during lower Piru Creek dewatering
Impact BIO-6: Project relocation of the outlet works would impact special-status fish species and their critical habitat.	Construction – S/Operation – O	Construction – L/Operation – O	Operation – O	MM BIO-4: Design and construct a geomorphically stable channel MM BIO-8: Fish relocation during lower Piru Creek dewatering
Impact BIO-7: Project relocation of the outlet works would affect special-status fish species due to impaired water quality.	Construction – S/Operation – O	Construction – S/Operation – O	Operation – O	MM BIO-9: Implement turbidity controls
Impact BIO-8: Project construction would impact jurisdictional wetland and waters resources.	Construction – S/Operation – O	Construction – S/Operation – O	Operation – O	MM BIO-4: Design and construct a geomorphically stable channel
Impact BIO-9: The Project would temporarily disturb wildlife movement and nursery sites.	Construction – L/Operation – O	Construction – L/Operation – O	Operation – O	None required

Impact	Proposed Project	Labyrinth Alternative (Alternative 2)	No Project Alternative (Alternative 3)	Mitigation Measures
Impact BIO-10: The Project would be consistent with local policies and ordinances protecting biological resources.	Construction – L/Operation – O	Construction – L/Operation – O	Operation - O	None required
The Project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or State habitat conservation plan.	Construction – O/Operation – O	Construction – O/Operation – O	Operation - O	None required
Cultural Resources				
Impact CUL-1: Project construction would alter the spillway and outlet works of Santa Felicia Dam, which has been recommended eligible for listing on the CRHR.	Construction – L/Operation - L	Construction – L/Operation - L	Operation - O	None required
Impact CUL-2: Project construction could result in the destruction of or damage to presently undocumented cultural resources.	Construction – S/ Operation – O	Construction - S/Operation - O	Operation - O	MM CUL-1: Follow inadvertent discovery procedures.
Impact CUL-3: Project ground-disturbing activities could encounter presently undocumented human remains.	Construction – L/ Operation – O	Construction - L/ Operation - O	Operation - O	None required
Impact CUL-4: Project ground-disturbing activities could encounter unique paleontological resources.	Construction - S/ Operation – O	Construction - S/ Operation - O	Operation - O	MM CUL-2: Follow procedures for encountering fossil remains.
Geology and Soils				
Impact GEO-1: The Project would reduce exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, ground-shaking, liquefaction, or landslides.	Construction – L/ Operation – B	Construction – L/ Operation – B	Operation – U	None required
Impact GEO-2: The Project would not result in substantial soil erosion or the loss of topsoil.	Construction – L/ Operation – S	Construction – L/ Operation – S	Operation – O	MM BIO-4: Design and construct a geomorphically stable channel
Impact GEO-3: The Project is not located on a geologic unit or a soil that is unstable, or that would become unstable as a result of the Project, and	Construction – L/ Operation – L	Construction – L/ Operation -L	Operation – O	None required

Impact	Proposed Project	Labyrinth Alternative (Alternative 2)	No Project Alternative (Alternative 3)	Mitigation Measures
potentially result in on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.				
The Project would not be located on expansive soil, creating substantial risks to life and property.	Construction – O/ Operation – O	Construction – O/ Operation – O	Operation – O	None required
The Project would not require any disposal of wastewater requiring soils capable of support a septic system.	Construction – O/ Operation – O	Construction – O/ Operation – O	Operation – O	None required
Greenhouse Gas Emissions				
Impact GHG-1: The Project would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.	Construction – L/ Operation – O	Construction – L/ Operation – O	Operation – O	None required
Impact GHG-2: The Project would not increase the potential for conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of greenhouse gases.	Construction – O/ Operation – O	Construction – O/ Operation – O	Operation – O	None required
Hazards and Hazardous Materials				
Impact HZ-1: The Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	Construction – L/ Operation – O	Construction – L/ Operation – O	Operation – O	MM HZ-1: Develop environmental awareness plan
Impact HZ-2: The Project could 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.	Construction – S/ Operation – O	Construction – S/ Operation – O	Operation – O	MM HZ-1: Develop environmental awareness plan
Impact HZ-3: The Project is located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment.	Construction – S/ Operation – O	Construction – S/ Operation – O	Operation – O	MM HZ-2: Develop contaminated soil/groundwater contingency plan
Impact HZ-4: The Project would not impair implementation of or physically interfere with an	Construction – L/ Operation – O	Construction – L/ Operation – O	Operation – O	None required

Impact	Proposed Project	Labyrinth Alternative (Alternative 2)	No Project Alternative (Alternative 3)	Mitigation Measures
adopted emergency response plan or emergency evacuation plan.				
Impact HZ-5: The Project could expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.	Construction – S/Operation – O	Construction – S/Operation – O	Operation - O	MM HZ-3: Develop fire control and emergency response plan
The Project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	Construction – O/Operation – O	Construction – O/Operation – O	Operation - O	None required
The Project is not located within an airport land use plan, or where such a plan has not been adopted, within two miles of a public airport or a public use airport and would not result in a safety hazard for people residing or working in the Project area.	Construction – O/Operation – O	Construction – O/Operation – O	Operation - O	None required
The Project is not located within the vicinity of a private airstrip and would not result in a safety hazard for people residing or working in the project area.	Construction – O/Operation – O	Construction – O/Operation – O	Operation - O	None required
Hydrology and Water Quality				
Impact HWQ-1: The Project would not violate any water quality standards or waste discharge requirements.	Construction – L/ Operation – O	Construction – L/ Operation – O	Operation - O	None required
Impact HWQ-2: The Project would substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.	Construction – L/ Operation – S	Construction – L/ Operation – S	Operation - O	MM BIO-4: Design and construct a geomorphically stable channel
Impact HWQ-3: The Project would substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a	Construction – L/ Operation – S	Construction – L/ Operation – S	Operation - U	MM BIO-4: Design and construct a geomorphically stable channel

Impact	Proposed Project	Labyrinth Alternative (Alternative 2)	No Project Alternative (Alternative 3)	Mitigation Measures
stream or river, in a manner which would result in flooding on- or off-site.				
Impact HWQ-4: The Project would result in a substantial reduction in geomorphic function (i.e., channel stability) in lower Piru Creek.	Construction – L/ Operation – S	Construction – L/ Operation – S	Operation - O	MM BIO-4: Design and construct a geomorphically stable channel
Impact HWQ-5: The Project would not create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.	Construction – L/ Operation – O	Construction – L/ Operation – O	Operation - U	None required
Impact HWQ-6: The Project would not otherwise substantially degrade water quality.	Construction – L/ Operation – O	Construction – L/ Operation – O	Operation - O	None required
Impact HWQ-7: The Project would not reduce the capacity of flood control facilities and watercourses.	Construction – L/ Operation – L	Construction – L/ Operation – L	Operation - O	None required
Impact HWQ-8: The Project would reduce exposure of people or structures to a significant risk of flooding because of dam or levee failure.	Construction – L/ Operation – B	Construction – L/ Operation – B	Operation - U	None required
Impact HWQ-9: The Project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted.	Construction – L/ Operation – S	Construction – L/ Operation – S	Operation - O	MM BIO-4: Design and construct a geomorphically stable channel
The Project would not result in scouring of the riverbed and floodplain to the point of causing a substantial increase in the frequency and magnitude of scouring of riparian vegetation in lower Piru Creek.	Construction – O/ Operation – O	Construction – O/ Operation – O	Operation - O	None required
The Project would not place housing within a 100-year flood hazard area, as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.	Construction – O/ Operation – O	Construction – O/ Operation – O	Operation - O	None required

Impact	Proposed Project	Labyrinth Alternative (Alternative 2)	No Project Alternative (Alternative 3)	Mitigation Measures
The Project would not place within a 100-year floodplain structures which would impede or redirect flood flows.	Construction – O/ Operation – O	Construction – O/ Operation – O	Operation - O	None required
The Project would not result in inundation by seiche or tsunami.	Construction – O/ Operation – O	Construction – O/ Operation – O	Operation - O	None required
Land Use and Planning				
The Project would not physically divide an established community, or otherwise result in an incompatible land use.	Construction – O/ Operation – O	Construction – O/ Operation – O	Operation – O	None required
The Project would not conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.	Construction – O/ Operation – O	Construction – O/ Operation – O	Operation – O	None required
The Project would not conflict with any applicable habitat conservation or natural community conservation plan.	Construction – O/ Operation – O	Construction – O/ Operation – O	Operation – O	None required
Mineral Resources				
Project construction and operation would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State.	Construction – O/ Operation – O	Construction – O/ Operation – O	Operation – O	None required
Project construction and operation would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.	Construction – O/ Operation – O	Construction – O/ Operation – O	Operation – O	None required
Noise				
Impact NOISE-1: The Project would expose persons to, or generate, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	Construction – U/ Operation – O	Construction – U/ Operation - O	Operation - O	MM NOISE-1: Noise reduction and control practices

Impact	Proposed Project	Labyrinth Alternative (Alternative 2)	No Project Alternative (Alternative 3)	Mitigation Measures
Impact NOISE-2: The Project would not expose people to, or generate, excessive vibration or ground-borne noise levels.	Construction – L/Operation – O	Construction – L/Operation – O	Operation - O	None required
Impact NOISE-3: The Project would cause substantial temporary or periodic increases in ambient noise levels in the Project vicinity above levels existing without the Project.	Construction – U/Operation – O	Construction – U/Operation – O	Operation - O	MM NOISE-1: Noise reduction and control practices
The Project would not cause a substantial permanent increase in ambient noise levels in the Project vicinity above noise levels existing without the Project.	Construction – O/Operation – O	Construction – O/Operation – O	Operation - O	None required
The Project is not located with 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 and would not expose people residing or working in the Project area to excessive noise levels.	Construction – O/Operation – O	Construction – O/Operation – O	Operation - O	None required
The Project is not within the vicinity of a private airstrip and would not expose people residing or working in the project area to excessive noise levels.	Construction – O/Operation – O	Construction – O/Operation – O	Operation - O	None required
Population and Housing				
Impact PH-1: Project construction and operation would not displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.	Construction – O/Operation – B	Construction – O/Operation – B	Operation – O	None required
Impact PH-2: Project construction and operation would not displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.	Construction – O/Operation – B	Construction – O/Operation – B	Operation – O	None required
The Project would not induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure).	Construction – O/Operation – O	Construction – O/Operation – O	Operation – O	None required

Impact	Proposed Project	Labyrinth Alternative (Alternative 2)	No Project Alternative (Alternative 3)	Mitigation Measures
Public Services				
Impact PUB-1: The Project could result in impacts to acceptable service ratios, response times or other performance objectives of police and fire protection services.	Construction – L/Operation – O	Construction – L/Operation – O	Operation - O	MM HZ-3: Develop fire control and emergency response plan MM TRAN-2: Emergency vehicle access plan
Recreation				
Impact REC-1: The Project would alter recreational access for boating.	Construction – U/Operation – L	Construction – U/Operation – L	Operation - O	None identified
Impact REC-2: The Project could reduce the quality of recreational experiences.	Construction – U/Operation – L	Construction – U/Operation – L	Operation - O	None identified
The Project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.	Construction – O/Operation – O	Construction – O/Operation – O	Operation - O	None required
The Project would not include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.	Construction – O/Operation – O	Construction – O/Operation – O	Operation - O	None required
Transportation and Traffic				
Impact TRAN-1: The Project would not substantially increase hazards due to a design feature or incompatible uses.	Construction – L/Operation – O	Construction – L/Operation – O	Operation –O	MM TRAN-1: Temporary Signage
Impact TRAN-2: The Project would not result in inadequate emergency access.	Construction – L/Operation – O	Construction – L/Operation –O	Operation –O	MM TRAN-2: Emergency Vehicle Access Plan MM HZ-3: Fire Control and Emergency Response Plan
The Project would not conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system.	Construction – O/Operation – O	Construction – O/Operation – O	Operation - O	None required

Impact	Proposed Project	Labyrinth Alternative (Alternative 2)	No Project Alternative (Alternative 3)	Mitigation Measures
The Project would not conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.	Construction – O/Operation – O	Construction – O/Operation – O	Operation - O	None required
The Project would not result in a change in air traffic patterns, including either an increase in traffic levels or a change in the location that results in substantial safety risks.	Construction – O/Operation – O	Construction – O/Operation – O	Operation - O	None required
The Project would not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.	Construction – O/Operation – O	Construction – O/Operation – O	Operation - O	None required
Tribal Cultural Resources				
The Project would not cause a substantial adverse change in the significance of a tribal cultural resource because no tribal cultural resources are present.	Construction – O/Operation – O	Construction – O//Operation – O	Operation - O	None required
Utilities and Services Systems				
The Project would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.	Construction – O/Operation - O	Construction – O/Operation - O	Operation - O	None required
The Project would not require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental impacts.	Construction – O/Operation – O	Construction – O/Operation - O	Operation - O	None required
The Project would not require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.	Construction – O/Operation – O	Construction – O/Operation - O	Operation - O	None required
The Project would have sufficient water supplies available to serve the Project from existing	Construction – O/Operation – O	Construction – O/Operation - O	Operation - O	None required

Impact	Proposed Project	Labyrinth Alternative (Alternative 2)	No Project Alternative (Alternative 3)	Mitigation Measures
entitlements and resources and no new or expanded entitlements needed.				
The Project would not result in a determination by the wastewater treatment provider that serves or may serve the Project that it has inadequate capacity to serve the Project's projected demand in addition to the provider's existing commitments.	Construction – O/Operation – O	Construction – O/Operation – O	Operation - O	None required
The Project would be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs.	Construction – O/Operation – O	Construction – O/Operation – O	Operation - O	None required
The Project would comply with Federal, State, and local statutes and regulations related to solid waste.	Construction – O/Operation – O	Construction – O/Operation – O	Operation - O	None required

Legend:

"B" – *Beneficial Impact* - the Project would result in an overall improvement to the existing baseline condition.

"O" – *No Impact* - the Project would not have any measurable environmental impact on the environment.

"L" - *Less than Significant Impact* - the Project may have the potential for affecting the environment, although these impacts will be below levels or thresholds that UWCD or other responsible agencies consider to be significant.

"S" – *Significant Impact but Mitigable to Less than Significant* - the Project may have the potential to generate impacts that will have a significant impact on the environment. However, the level of impact would be reduced to levels that are less than significant with the implementation of mitigation measures.

"U" - *Significant Unavoidable Impact* - the Project may result in environmental impacts that are significant and cannot be reduced to levels that are less than significant even with the implementation of mitigation measures.

1 INTRODUCTION

United Water Conservation District (UWCD) proposes the Santa Felicia Dam Safety Improvement Project (Project) to address two safety-related components of the dam. First, the Project would replace the existing outlet works, consisting of the intake structure, conduit, hydroelectric power turbines, and downstream control facilities, due to the potential for failure under seismic loading conditions and impacts associated with sedimentation near the intake tower. Second, the Project would increase the conveyance capacity of the existing spillway to sufficiently pass the Inflow Design Flood (IDF)¹, which for the Santa Felicia Dam consists of the Probable Maximum Flood (PMF)² of 220,000 cubic feet per second (cfs). Santa Felicia Dam is located at the southern edge of Lake Piru Reservoir, approximately 4.5 miles northeast of the unincorporated town of Piru in Ventura County, California (Figure 1-1).

The Project involves a discretionary action by UWCD and, therefore, it is subject to the provisions of the California Environmental Quality Act (CEQA). This Environmental Impact Report (EIR) has been prepared in conformance with CEQA (Public Resources Code Section 21000 et seq.) and the State CEQA Guidelines (Title 14, California Code of Regulations, Section 15000 et seq.). The purpose of this document is to inform governmental decision makers and the public about the potential significant environmental effects associated with the Project.

This EIR was released in draft form (Draft EIR) for a 45-day public review period. Notification of the public review period and public meetings were published in the Ventura County Star and posted on the UWCD project website. In addition, notification letters were mailed to identified stakeholders. Public meetings will be held to solicit additional input from interested parties on the content and conclusions reached in the Draft EIR. All comments received on the Draft EIR during the public review period will be addressed in the Final EIR. The Final EIR will include comments and responses, as well as any changes to the text, maps, exhibits, or other graphics of the EIR. As Lead Agency, UWCD's Board of Directors (Board) will then consider certification of the EIR and, subsequently, UWCD's Board will consider whether to approve the Project.

As described in CEQA Guidelines Section 15121(a), an EIR is a public information document that assesses potential environmental impacts of a proposed project and identifies mitigation measures and alternatives to the project that could reduce or avoid adverse environmental impacts. It is not the purpose of the EIR to recommend either approval or denial of a project. Rather, the EIR serves to provide full disclosure of potential environmental impacts of the proposed Project for UWCD's Board review and consideration.

¹ Inflow Design Flood – the flood flow above which the incremental increase in water surface elevation due to failure of a dam or other water impounding structure is no longer considered to present an unacceptable threat to downstream life or property. The IDF is used in the design of a dam and appurtenant works particularly for sizing the spillway and outlet works, and for determining the maximum height of a dam, freeboard, and temporary storage requirements.

² Probable Maximum Flood – the flood that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in the drainage basin under study. The PMF also represents the upper limit for determining the IDF.

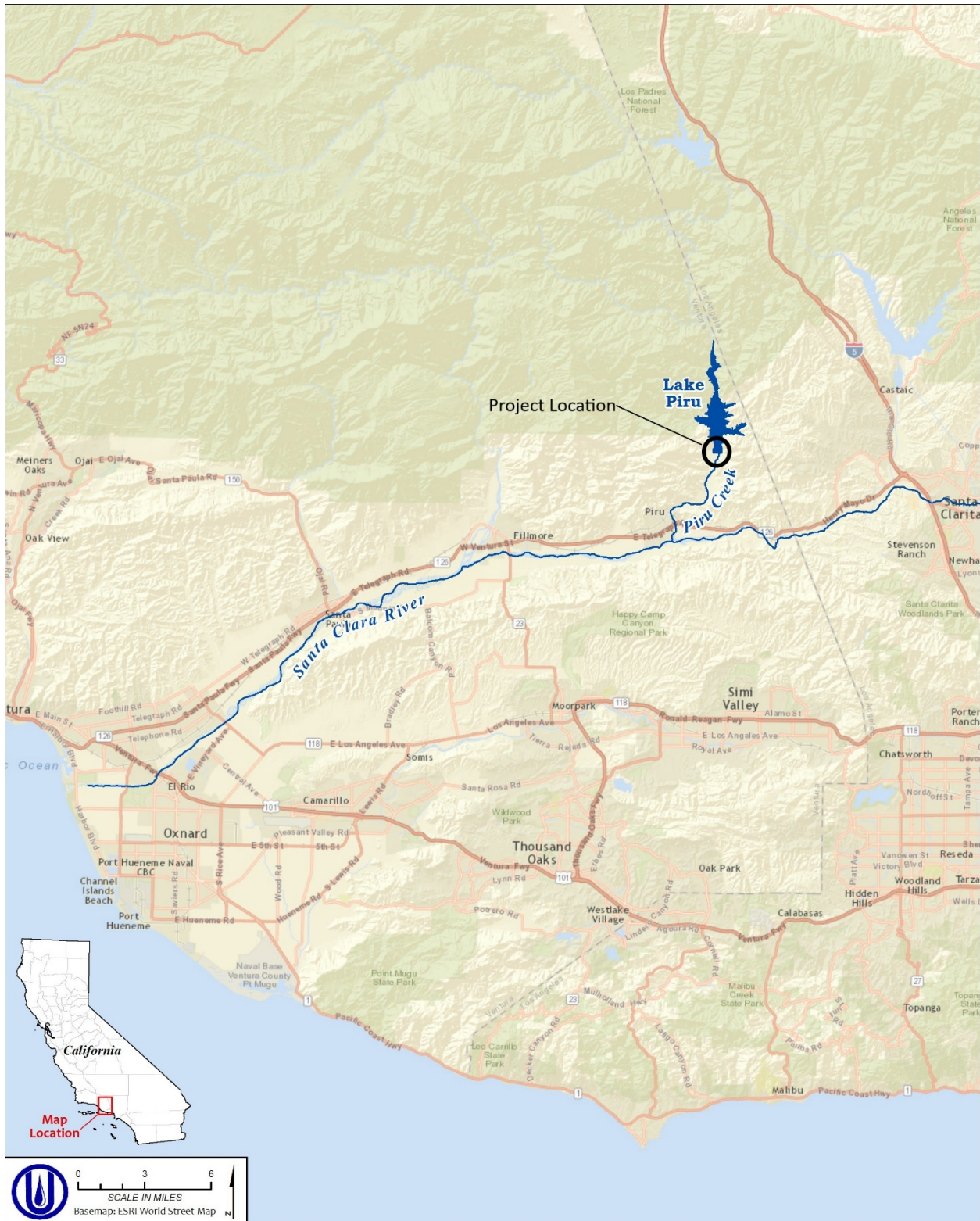


Figure 1-1 Project Location Map

The primary function of the Santa Felicia Dam and its reservoir, Lake Piru, is to provide water for recharge of the collective groundwater basins within UWCD's service area. In addition to water storage and conveyance, Santa Felicia Dam provides hydroelectric power generation and is, therefore, regulated by a license issued by the Federal Energy Regulatory Commission (FERC) under the Federal Powers Act (FERC License No. 2153). After the EIR is certified, FERC will conduct a separate environmental review in accordance with the National Environmental Policy Act (NEPA) to evaluate potential environmental impacts associated with issuance of the amendment to UWCD's FERC license, which is required prior to implementation of the Project.

1.1 Agency Authority

The lead agency is the public agency that has the greatest responsibility for carrying out or approving a project which may have a significant effect upon the environment (Public Resources Code Section 21067). For this Project, UWCD is the lead agency for CEQA.

UWCD is a water conservation district, established in accordance with California Water Code Section 74000 et seq. UWCD's mission is to manage, protect, conserve, and enhance the water resources of the Santa Clara River, its tributaries, and associated aquifers in the most cost-effective and environmentally balanced manner. Its statutory powers include the ability to conduct water resource investigations, acquire water rights, build facilities to store and recharge groundwater, construct wells and pipelines for water deliveries, commence actions involving water rights and water use, prevent interference with or diminution of river flows and associated natural subterranean supply of water, and to acquire and operate recreational facilities. UWCD is composed of seven geographic divisions and is governed by a seven-person board of directors elected by division. UWCD's revenues include groundwater extraction (pump) charges, in-lieu water delivery charges, ad valorem property taxes, property tax assessments, and recreation fees.

UWCD's boundaries encompass nearly 213,000 acres of central and southern Ventura County. This area includes the downstream (Ventura County) portion of the Santa Clara River Valley, as well as the Oxnard Plain (Figure 1-2). UWCD serves as the steward for surface water and groundwater resources in all, or portions of, eight interconnected groundwater basins.

UWCD currently operates multiple facilities, including the Santa Felicia Dam, the Freeman Diversion, and water recharge and delivery infrastructure in the Santa Clara River Watershed and the Oxnard Plain. These facilities allow UWCD to store winter runoff for release at other times, divert water from the Santa Clara River, recharge aquifers through recharge basins, and deliver water to cities and agricultural growers so that groundwater pumping is reduced in critical aquifers subject to overdraft. UWCD prepares annual reports on groundwater conditions and regularly provides information associated with its operations and facilities. In addition to its physical facilities, UWCD advocates for policy and management changes to manage and mitigate demands on the basins and to preserve groundwater quality. Since it was formed in 1950, UWCD has served both cities and agricultural operations within its service area.

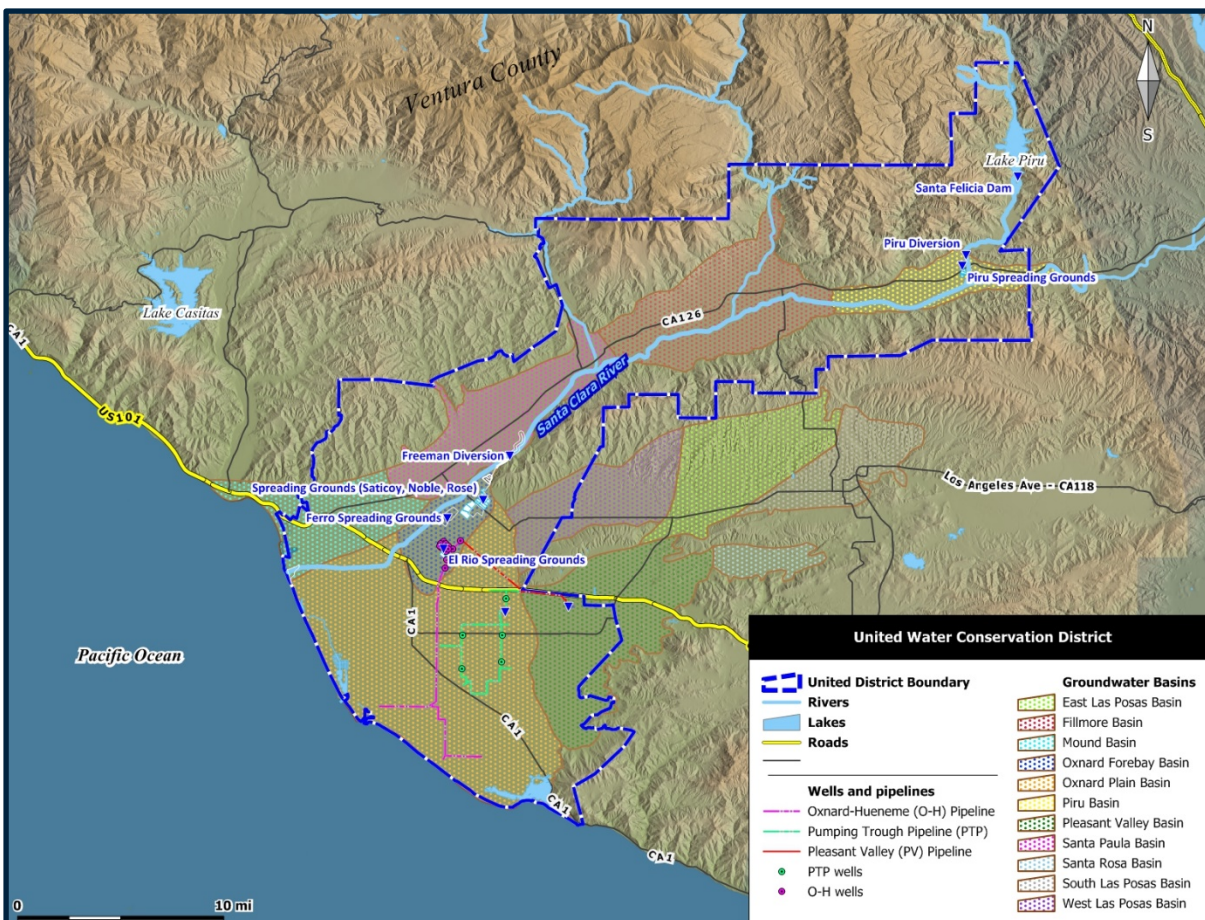


Figure 1-2 UWCD Boundary, Facilities, and Managed Aquifers

1.2 Project Location

The Project is located near the unincorporated town of Piru in Ventura County, California. The Project site is accessed from Piru Canyon Road via State Route 126. The Project location is shown in Figure 1-1. The area immediately surrounding the Santa Felicia Dam consists of open space.

1.3 Project Objective

CEQA Guidelines Section 15124(b) requires the project description to include a statement of objectives for the proposed project, including the underlying purpose of the proposed project. Compatibility with project objectives is one criterion for selecting a range of reasonable project alternatives and provides a standard against which to measure project alternatives.

The objective of the proposed Project is to improve the safety of Santa Felicia Dam. Improvements are required both to ensure that the outlet works can withstand loading from the Maximum Credible Earthquake (MCE) and that the spillway can safely convey the outflow from the regulatory IDF. In addition, intake improvements are needed to mitigate the accumulation of sediment in the reservoir which is projected to reach the inlet of the intake tower sometime between 2023 and 2025. If sediment accumulates to the crest of and/or above the inlet of the intake tower, then UWCD may lose the ability to control water releases from the dam.

1.4 Agency Approvals

The Project does not include any changes to current operations of Santa Felicia Dam. However, design and construction of the Project will have regulatory and permitting compliance requirements as described in the following sections.

1.4.1 Dam Safety Compliance

Santa Felicia Dam is under the regulatory authority of the California Department of Water Resources Division of Safety of Dams (DSOD) at the state level and FERC at the federal level for dam safety issues. Both agencies will review and approve the analyses, designs, plans, and specifications for construction of the spillway and the outlet works improvements. UWCD has empaneled an independent Board of Consultants (BOC) to assist in the development of the Project design and support DSOD and FERC in the design review process. The engagement and interactions between UWCD, DSOD, FERC, and the BOC follow a prescribed, structured regulatory process.

1.4.2 Federal Approvals

UWCD has a license issued by FERC for the Santa Felicia Dam Hydroelectric Project (FERC License No. 2153). A license amendment is required to implement the Project due to modifications of the dam and hydroelectric plant. FERC will conduct a separate NEPA review for issuance of a license amendment after this EIR is completed and certified.

In addition to FERC's role in the license amendment process, FERC also monitors compliance with license conditions that were part of the Santa Felicia Dam Hydroelectric Project license renewal in 2008, and with conditions contained within the Biological Opinion for the license renewal which resulted from FERC's consultation the National Marine Fisheries Service (NMFS) under Section 7 of the federal Endangered Species Act (ESA). These conditions include ongoing work that is relevant to the Project. Compliance actions associated with these license conditions have already commenced and the Project is designed to allow those compliance processes to continue. One compliance matter that is relevant to this Project relates to fish passage around/over Santa Felicia Dam. A feasibility study of upstream and downstream fish passage for endangered southern California steelhead (*Oncorhynchus mykiss*) was conducted in 2015 to comply with the requirements of the Biological Opinion issued by the NMFS on May 5, 2008. The study was conducted by the Santa Felicia Dam Fish Passage Panel, an independent panel of fish passage experts that was established in 2013. The panel's recommendations are currently being implemented in coordination with FERC and NMFS through a separate, independent process.

Another ongoing compliance matter is the development of a Habitat Improvement Plan (HIP) to address and minimize the geomorphic effects of the Santa Felicia Dam and its operations on the quality and quantity of habitat for southern California steelhead in lower Piru Creek downstream of Santa Felicia Dam. This plan is also being developed to comply with the requirements of the Biological Opinion issued by NMFS on May 5, 2008. The most recent draft of the HIP was submitted to NMFS in November 2017, and to FERC in February 2018. Development of the HIP is being conducted in coordination with FERC and NMFS through a process that is separate and independent from the proposed Project.

A Clean Water Act (CWA) Section 404 permit from the US Army Corps of Engineers (USACE) will be required for dredge and fill operations in wetlands or other jurisdictional waters of the US that are necessary to implement the Project.

Consultation with the US Fish and Wildlife Service (USFWS) and NMFS pursuant to Section 7 of the ESA is required to address potential effects to federally-listed species. FERC will be the Lead Federal Agency for Section 7 consultation, and UWCD is their non-federal designee for informal consultation with the USFWS and NMFS.

Consultation with the State Historic Preservation Office (SHPO) pursuant to Section 106 of the National Historic Preservation Act (NHPA) is required to address cultural resources requirements. FERC will be

the Lead Federal Agency for the Section 106 consultation, and UWCD is their non-federal designee to coordinate the process. In addition, Assembly Bill 52 requires leads agencies to consult with California Native American tribes that have requested formal consultation on a project, either at the onset of the project or when the Notice of Preparation (NOP) of an EIR is released. UWCD submitted letters to local tribal representatives notifying them of the Project and inviting consultation in March 2017, as described in Section 5.18.

1.4.3 State and Local Approvals

The DSOD will review an Application for Repair and ensure that all dam safety related issues are addressed to their satisfaction.

If the Project is approved, UWCD would need to obtain a CWA Section 401 Water Quality Certification from the State Water Resources Control Board (SWRCB) for potential water quality effects to state water that would result from fill and dredge operations necessary to implement the Project.

UWCD would also need to comply with the National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit in compliance with Section 402 of the Clean Water Act from the Los Angeles Regional Water Quality Control Board (LARWQCB). UWCD may be required to obtain a Waste Discharge Requirements (WDR) permit from the LARWQCB under the Porter-Cologne Water Quality Control Act for operational stormwater discharges.

In addition, UWCD would comply with Section 1600 of the Fish and Game Code (FGC) and would need to obtain a Lake and Streambed Alteration Agreement from the California Department of Fish and Wildlife (CDFW) for modifications to state waters.

UWCD would also comply with the California Endangered Species Act (CESA) Section 2080.1 (dual State and Federally-listed species) and, if required, consult with the CDFW to obtain a California incidental take permit.

Lastly, the construction of the tunnel portion of the Project would require compliance with California Division of Occupational Safety and Health (Cal/OSHA) health and safety requirements. In addition, if construction of the tunnel necessitates the use of a diesel generator in the tunnel, then an Underground Diesel Permit would be required from Cal/OSHA.

1.5 Public Outreach

CEQA encourages the Lead Agency to have early public consultation directly with any person or organization it believes will be concerned with the environmental effects of a project. The following paragraphs describe the public outreach activities completed to date for the Project, including publishing a Notice of Preparation (NOP), holding public scoping meetings, and developing a summary of the comments received through the public scoping process.

1.5.1 Scoping Process

UWCD published an NOP for the Project on April 3, 2017 (State Clearinghouse Number 2017041005). The NOP began a 30-day scoping period for the Project. In addition to publication of the NOP by the Office of Planning and Research State Clearinghouse, UWCD posted a notice soliciting comments on the agency website and published advertisements in the Ventura County Star on April 4, 2017. CEQA does not require an agency to conduct scoping meetings unless the project may affect highways or other State of California Department of Transportation (Caltrans) facilities or the project is of "statewide, regional, or areawide significance." However, UWCD hosted two scoping meetings for the Project on April 18, 2017, the first from 1:00-3:00 p.m. and the second from 6:00-8:00 p.m. at the Courtyard by Marriott in Oxnard, California. The meetings were conducted in an open house workshop format with information stations placed around the room and a court reporter to take oral comments. No comments were received at the scoping meetings.

During the scoping period, a total of ten comment letters were submitted by mail and/or email. Each comment letter discussed multiple issue areas. Figure 1-3 shows the breakdown of comments by issue area from scoping. As shown in the figure, from the ten comment letters, a total of 32 individual comments were submitted. The primary issues raised in the scoping letters related to potential impacts to biological resources, potential impacts to traffic and transportation during construction, and support for the Project's public safety objectives. These issues are addressed within the relevant environmental resource section of this EIR.

Specifically, the scoping process identified several issues, which are addressed in the EIR, as indicated below:

- > The potential for adverse effects to air quality during construction (Section 5.4.3);
- > The need for surveys for special status species; an assessment of existing biological resources; discussion of the effects of noise, light, and drainage on biological resources; and development of mitigation measures to avoid and/or minimize Project-related effects on biological resources (Section 5.5);
- > The need to provide a reasonable range of alternatives (Section 4) and discussion of the purpose and objective of the Project (Section 1.3);
- > The potential for adverse effects of Project construction on access roads and accessibility (Section 5.17.3);
- > The potential for adverse effects of Project construction on public safety, specifically emergency vehicle access (Sections 5.15.3 and 5.17.3);
- > The potential for adverse effects of noise during construction activities (Section 5.13.3);
- > The potential effects of construction activity on whitewater recreation downstream (Section 5.16.3); and
- > The potential for adverse effects to water supply downstream during construction (Section 5.10.3.1).

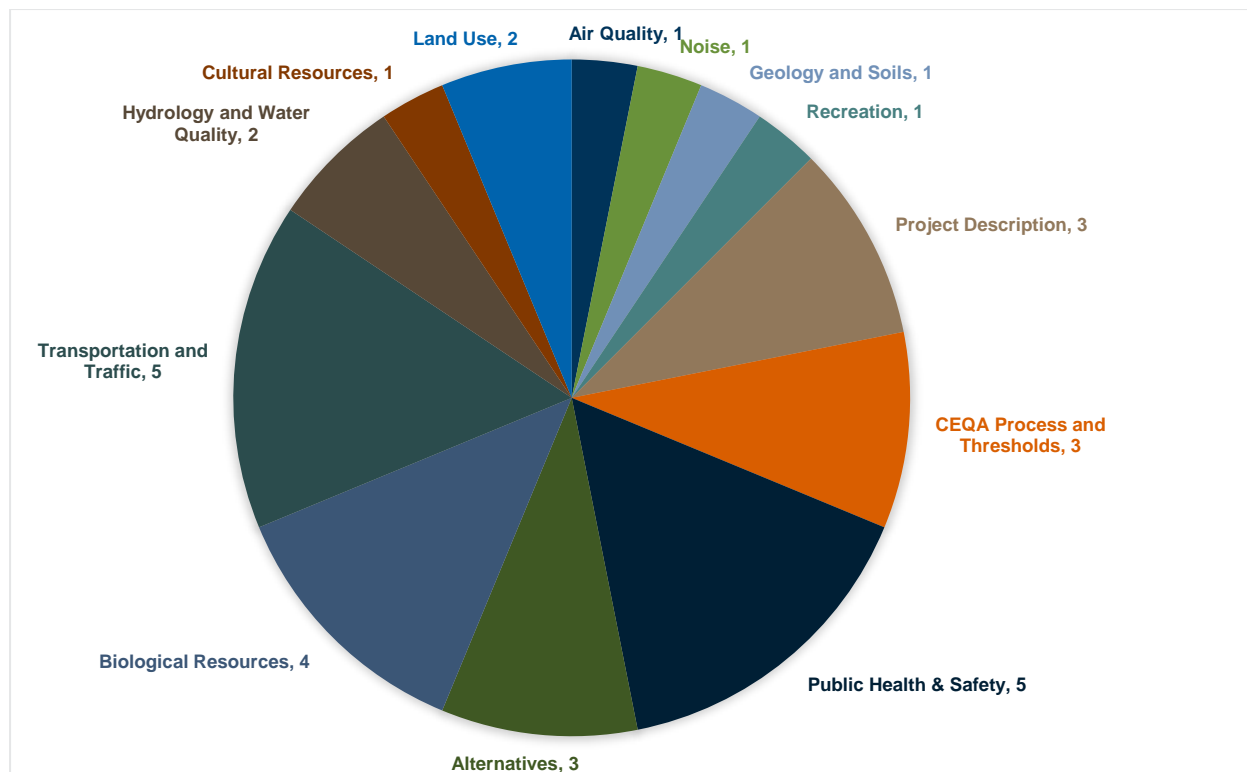


Figure 1-3 Distribution of Scoping Comments by Topic

1.5.2 Enhanced Outreach

On April 19, 2017, UWCD staff attended a meeting of the Piru Neighborhood Council. UWCD staff gave a presentation describing the Project and the regulatory process. UWCD staff then participated in a discussion with the Neighborhood Council, providing further details.

1.5.3 Government-to-Government (AB-52) Consultations

Assembly Bill 52 (AB-52) directs the lead agency preparing the CEQA document to consult with Native American Tribes. Pursuant to AB-52, UWCD sent consultation notification letters and NOPs to seven Tribes. No Tribes have requested formal consultation with UWCD. The AB-52 process for this Project remains open to afford the Tribes an opportunity to review the entire EIR before concluding the AB-52 process.

1.5.4 Public Review of Draft EIR

To announce the availability of the Draft EIR for public review and comment, UWCD issued a Notice of Availability (NOA). The NOA (State Clearinghouse Number 2017041005) initiated the public comment period, which occurred over a 45-day period from November 5 to December 20, 2018. The NOA included a brief overview of the Project, CEQA process and Draft EIR; information on where to review a hard-copy of the Draft EIR; the public comment meetings; and information on how to submit a comment.

In addition to publication of the NOA by the Office of Planning and Research State Clearinghouse, UWCD posted a notice soliciting comments on the agency website, sent a notice to interested parties based on responses during scoping, placed bound copies in nearby public libraries, and published advertisements in the Ventura County Star on November 5, 2018.

A public hearing was held on December 12, 2018 from 12:00 pm to 1:00 pm at UWCD's headquarters in Santa Paula. In addition to one oral comment at the public hearing, seven public comment letters were submitted during the comment period. Within the comment letters, 78 substantive issues/comments were identified. Responses to each comment were developed to provide the commenter with a clear depiction of how their comment fits in the EIR. Comment letters and associated responses are provided in Appendix D.

1.5.5 Publication of Final EIR

UWCD has evaluated the comments received during the Draft EIR public comment period and prepared a written response to each issue raised in the comment letters. Commenters can find responses to their issues raised in Appendix D. Changes have been made to the EIR in response to these comments.

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2 CURRENT FACILITIES AND OPERATIONS

The Project does not propose changes to the water storage capacity of Lake Piru Reservoir or existing operations and therefore the EIR focuses primarily on construction-related impacts. However, a description of existing operations provides context for the environmental setting, for the actions required to meet the Project objectives, and for the potential changes that may occur from current adaptive management plans and compliance activity associated with the FERC license for the Santa Felicia Hydroelectric Project. This Section describes continuing operations to a level of detail that supports the environmental analysis.

UWCD constructed Santa Felicia Dam across Piru Creek in Ventura County, California between 1954 and 1955 (Figure 1-1). Aerial photographs of the Lake Piru Reservoir and Santa Felicia Dam are shown in Figure 2-1 and Figure 2-2. The dam was built to store water during high creek flows in Lake Piru Reservoir, for later release to provide water for recharge of the collective groundwater basins within UWCD's service area as well as agricultural, municipal, and industrial use in the Santa Clara River Valley and Coastal Plain. Lake Piru Reservoir receives flows from middle Piru Creek (situated between Pyramid Lake and Lake Piru Reservoir) and water releases from Pyramid Lake that include water purchased from the State of California through the State Water Project, as well as water from upper Piru Creek (upstream of Pyramid Lake).

Santa Felicia Dam also generates hydroelectric power, and as such, UWCD operates the dam and associated infrastructure in accordance with the terms and conditions of FERC License No. 2153, issued in 2008 by FERC under the Federal Powers Act. These requirements address structural engineering, water quality, and public safety as well as the management of land, biological resources, and recreational opportunities. Operations are also addressed in the Biological Opinion issued by NMFS to FERC on May 5, 2008, in accordance with the Section 7 consultation conducted by FERC as part of the hydroelectric license renewal process.



Figure 2-1 Lake Piru Reservoir

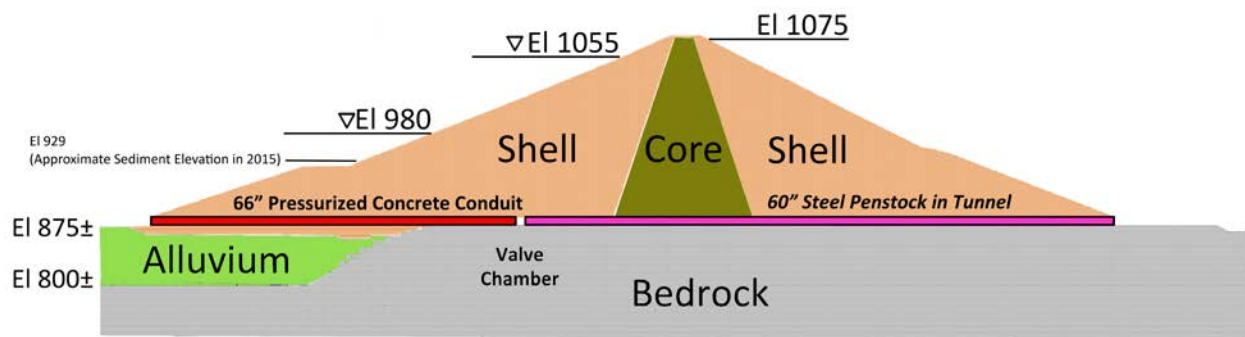


Figure 2-2 Santa Felicia Dam and Spillway

2.1 Santa Felicia Dam and Lake Piru Reservoir

Santa Felicia Dam is a zoned earthfill embankment with a central impervious core and relatively pervious shells on the upstream and downstream sides of the core. The dam extends 213 feet above the streambed and is approximately 1,260 feet long at the crest. The elevation of the crest of the dam is 1,075 feet mean sea level (msl) and contains a parapet wall on the upstream side with a top situated at 1,078 feet msl (Figure 2-3). The maximum operating elevation (maximum pool) of Lake Piru Reservoir is at 1,055 feet msl. The original reservoir storage capacity of Lake Piru Reservoir was 100,000 acre-feet at maximum pool. However, ongoing sediment accumulation in the reservoir has reduced the current reservoir capacity to approximately 81,986 acre-feet based on a 2015 bathymetric survey.

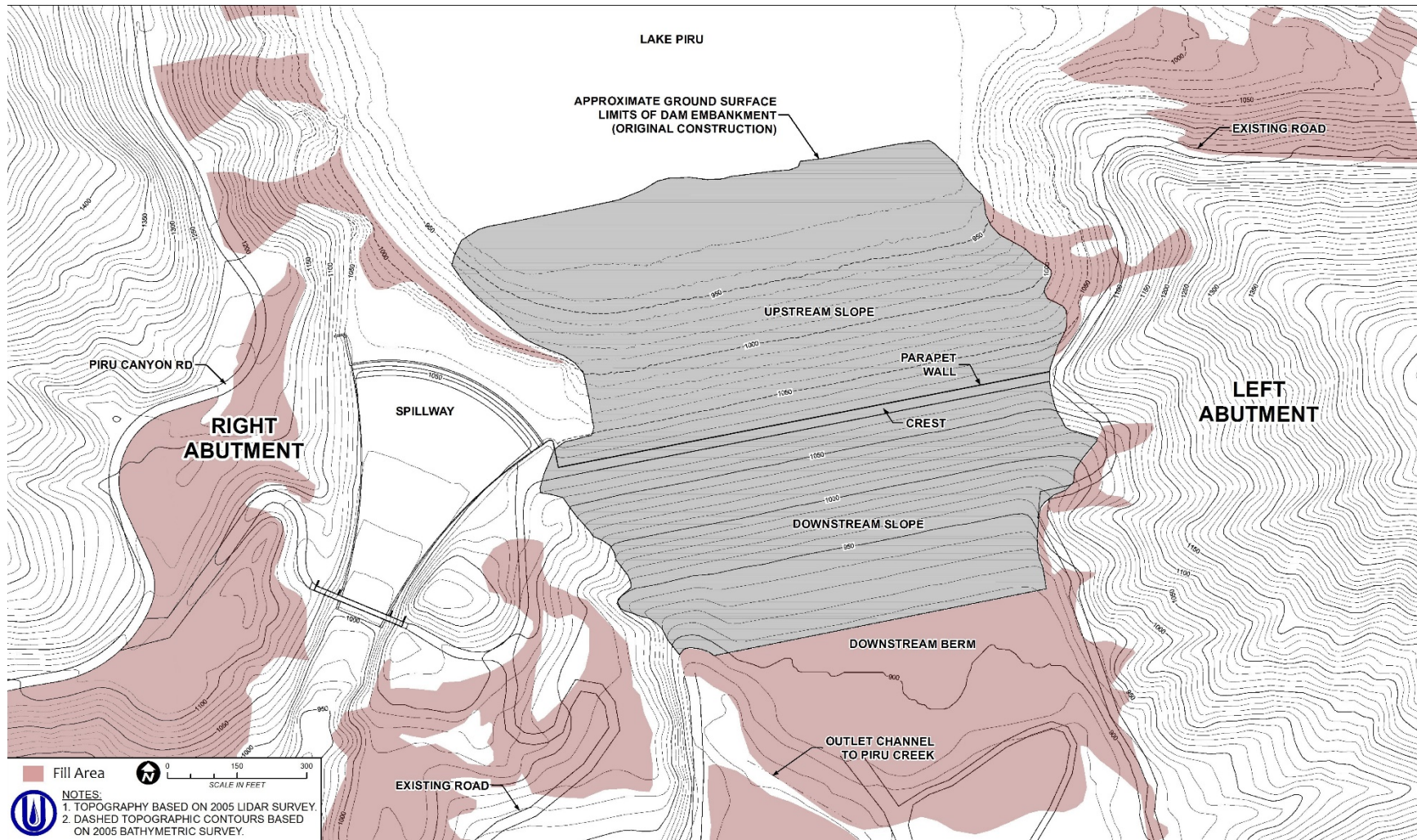
UWCD strives to maintain an operational minimum pool of 20,000 acre-feet (AF) storage to help prevent the accumulation of sediment around the outlet works for the Santa Felicia Dam. However, due to drought conditions, the volume of water stored in Lake Piru Reservoir as of July 1, 2018 was 14,400 AF.



Source: GEI 2017a

Figure 2-3 Santa Felicia Dam Components and Key Elevations

The core of Santa Felicia Dam was founded on shale and sandstone bedrock following excavation of a core trench to remove streambed alluvium. The shells of the dam are founded on streambed alluvium, as well as shale and sandstone bedrock at the abutments. A grout curtain was constructed through bedrock below the core. The upstream slope of the dam is covered with rip rap, and the downstream slope is covered with a cobble blanket. The outlet works system is located on the west side of the dam (right side when looking downstream from Lake Piru Reservoir), and a concrete-lined uncontrolled spillway is located adjacent to the west (right) abutment. A summary of key data related to the dam and Lake Piru Reservoir is provided in Table 2-1. Construction of the dam and excavation of the spillway led to the placement of large volumes of fill material in the vicinity, primarily on the west side of lower Piru Creek. The material primarily consisted of silts and sands, with some associated gravel, cobbles, and boulders. Figure 2-4 depicts the area of fill, with thicknesses up to 75 feet.



Source: GEI 2017a

Figure 2-4 Approximate Area of Construction Fill Placement

Table 2-1 Summary of Key Data for Santa Felicia Dam and Lake Piru Reservoir

Dam	
Height	~213 feet above streambed, ~273 feet above lowest foundation
Crest Length	1,260 feet
Crest Width	30 feet
Crest Elevation	1,075 feet msl
Parapet Wall Elevation	1,078 feet msl
Upstream Slope	2.25H:1V (Horizontal:Vertical)
Downstream Slope	2H:1V
Upstream Slope Protection	Rip rap
Downstream Slope Protection	Cobbles and large gravel
Freeboard	20 feet to top of dam crest, 23 feet to top of parapet wall
Spillway	
Type	Uncontrolled ogee weir
Length of Weir	475 feet
Crest Elevation	1,055 feet msl
Reservoir Capacity	
1957 Survey	101,225 acre-feet
2005 Survey	83,244 acre-feet (reduced due to siltation)
2015 Survey	81,986 acre-feet (reduced due to siltation)
Watershed	
Area	423 square miles
Outlet Works	
Intake Tower, Inlet Elevation	932.6 feet msl
Pressure Conduit	66-inch-diameter reinforced concrete, 400 feet long
Penstock	60-inch-diameter welded steel pipe, 640 feet long in open tunnel
Shut-off/Control	72-inch butterfly valve, at upstream end of penstock in tunnel
Discharge/Control	Two 36-inch hollow cone valves, at downstream end of penstock
Low Flow Release/Control	12-inch-diameter HDPE and welded steel pipes; discharge via two pipes with butterfly valves
Discharge Capacity	500 cfs, normal operation
	835 cfs, emergency releases w/ reservoir at spillway crest
	7 to 20 cfs, low-flow system for minimum release requirements
Powerhouse	
Two Yaskawa Generators	1,420 kilowatt total capacity

Notes:

All elevations are based on 1929 National Geodetic Vertical Datum (NGVD) relative to Mean Sea Level

Table adapted from June 2017 Supporting Technical Information document (UWCD 2017)

cfs = cubic feet per second, msl = mean sea level

2.2 Spillway Characteristics

A reinforced concrete spillway is located immediately west of the dam (adjacent to the right abutment) within a natural topographic feature that was modified by excavation into bedrock to accommodate the crest structure and spillway chute. Figure 2-4 shows the location of the spillway. The spillway crest and chute are discussed further below.

2.2.1 Spillway Crest

The spillway consists of an ungated ogee¹ crest built on a 475-foot-long circular arc with a 400-foot radius. The spillway crest is situated at an elevation of 1,055 feet msl. The overall length of the ogee crest is 30 feet from the upstream vertical face to the beginning of the chute. The exterior faces of the ogee are constructed of reinforced concrete. The upstream-most portion of the ogee is founded on bedrock and has a maximum height of approximately 15 feet above the foundation. A 5-foot-deep reinforced concrete cutoff extends below the foundation level on the upstream end of the ogee. The cutoff is 5-feet wide at the top and 3.5-feet wide at the bottom. A grout curtain² extends below the cutoff. Most of the ogee section is founded directly on concrete fill placed over bedrock.

A massive counterfort wall is provided on the right abutment of the dam to retain the embankment fill adjacent to the left side of the spillway crest and chute. This wall has a rounded projection into the reservoir that helps to train flow toward the ogee crest. The training wall on the right side of the crest structure extends into the reservoir and is curved to tie into the right abutment excavation for the spillway. Figures 2-6 and 2-7 provide photographs of the spillway crest.



Source: UWCD file photo 2015

Figure 2-5 Spillway Crest under Dry Conditions (UWCD file photo, 2015)

¹ An ogee spillway forms a part of the dam itself and has control structures that consist of ogee-shaped crests (crests that are S-shaped when viewed in profile in profile).

² A grout curtain is a barrier that protects the foundation of a dam from seepage and can be made during initial construction or during repair. Additionally, they can be used to strengthen foundations and contain spills.



Source: UWCD file photo 2005

Figure 2-6 Spillway Crest during a Spill Event (2005)

2.2.2 Spillway Chute

Water flows over the ogee crest into a 570-foot long funnel-shaped reinforced concrete chute with vertical side walls. In plan-view, the vertical walls are built on circular arcs that converge toward the downstream end of the chute. Laterally, the walls tie into the dam core on the east and into bedrock on the west. The spillway chute discharges into a bedrock side canyon over a pile-supported, cantilevered rectangular section that is 104.3-feet wide. The concrete floor of the spillway chute slopes, increasing with distance, from the toe of the ogee section to the cantilevered rectangular section.

Where these walls are also acting as retaining walls, they are drained into either the spillway floor sub-drains or drains situated on the outside of the spillway walls. Original construction vertically extended the upstream portion of these walls to the elevation of the dam crest (1,075 feet msl). Revised calculations of the PMF in 1972 led UWCD to add a full-grouted and reinforced concrete masonry unit wall extension to the top of the sidewalls. These sidewalls vary in height along the spillway flow direction in order to confine flow with a designed five-foot freeboard.

A single lane bridge for vehicular dam access crosses the spillway at its narrowest location. Water flow under the bridge and into the discharge channel below the concrete spillway during a spill event is shown in Figure 2-7. The bridge, constructed in 1956, is 12 feet wide and consists of three concrete spans. The center span is 122 feet long and clears the spillway sidewalls. The west and east spans are 51 feet and 31 feet long, respectively. The bottoms of the bridge girders are situated at 1,058.75 feet msl. UWCD must be able to drive heavy equipment (e.g., water trucks, small dozers, concrete trucks, semi-trucks, and trailers) over the bridge when the spillway is discharging and the lower access road is not available. The bridge was originally designed for a HS15 44 vehicular load (54,000 pounds [lbs]), but currently UWCD

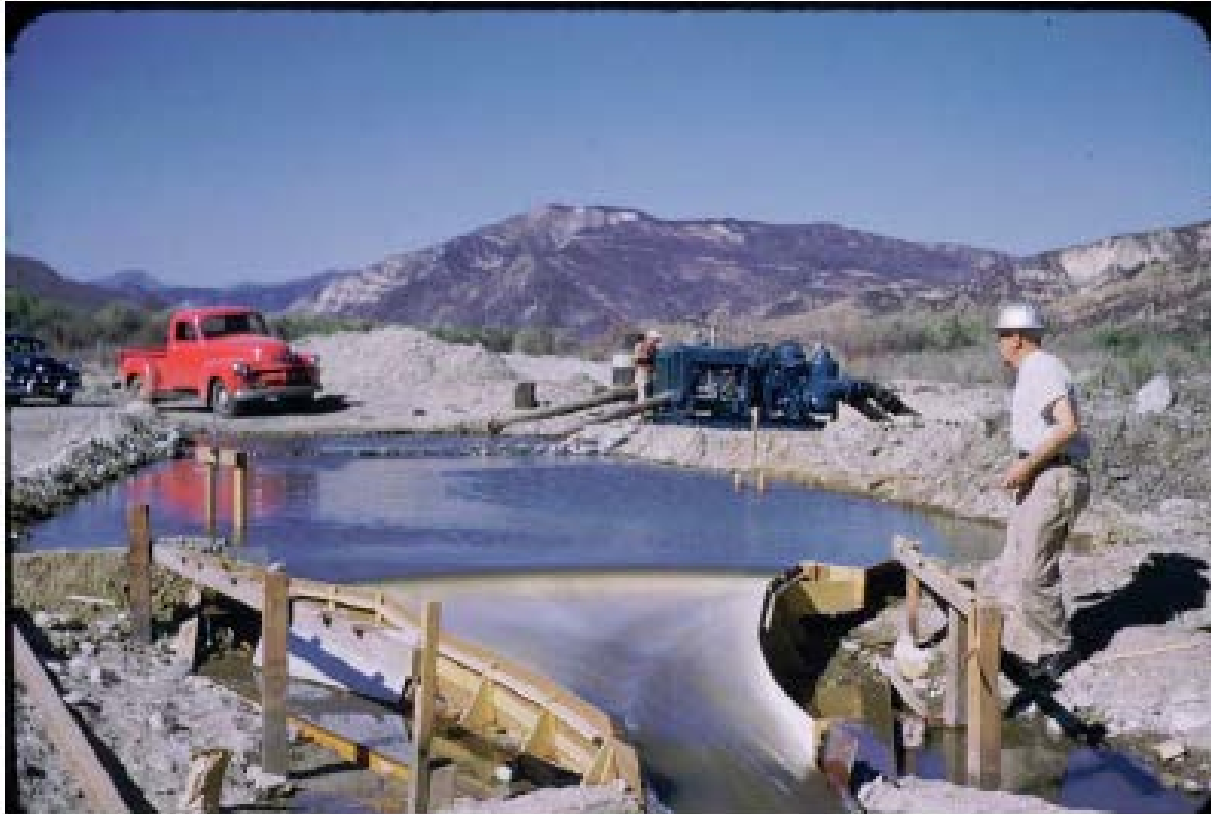
only allows vehicles less than 15,000 lbs to cross the bridge. In regard to the seismic design, the bridge was initially designed for a seismic acceleration of 0.15g (g is the acceleration due to Earth's gravity), but, in 2009, the bridge underwent a seismic retrofit and the superstructure was strengthened to withstand a seismic acceleration of 0.80g.



Source: UWCD file photo February 2005

Figure 2-7 Santa Felicia Spillway during February 2005 Spill Event Spillway Capacity

The original spillway rating curve was developed in 1956 through discharge and head measurements on a 1:50 scale model of the Santa Felicia Dam spillway structure (Figure 2-8), and the results indicated a maximum conveyance capacity of 147,000 cfs. However, these and other calculations conducted prior to 2007 did not fully account for submergence effects caused by the narrowing spillway chute. Accounting for these effects, the current spillway capacity is estimated at approximately 145,000 cfs before the chute walls begin to overtop. With the reservoir at an elevation of 1,075 feet msl (embankment dam crest), the ogee spillway could discharge approximately 152,000 cfs. With the reservoir at an elevation of 1,078 feet msl (top of parapet wall), the spillway could discharge approximately 168,000 cfs.



Source: UWCD file photo September 1954

Figure 2-8 Spillway Scale Model Testing

2.3 Outlet Works Characteristics

The outlet works system consists of an intake tower within Lake Piru Reservoir, a conduit through the dam, hydroelectric generation facilities, and the downstream control facilities on the west side of the dam. Each is described in the following subsections.

2.3.1 Intake Tower

The existing intake structure within Lake Piru Reservoir consists of a vertical tower with an overflow drop inlet situated at an elevation of 932.6 feet msl. The inlet is protected by a conical trash rack. The tower is connected to an upstream pressure conduit, which terminates at a valve vault within the dam. This vault opens to a downstream reinforced concrete tunnel that contains a steel penstock. The penstock leads to the downstream control facilities that consist of two, 36-inch diameter hollow cone (fixed-cone) valves and two smaller valves for low-flow releases.

The original intake structure was located at the upstream toe of the embankment dam, and consisted of a submerged, uncontrolled intake structure resting on a vertical concrete shaft with a sill elevation at 890 feet msl. During the first 21 years of operation, Piru Creek deposited sufficient sediment and debris in the Lake Piru Reservoir to block all four lateral openings of the original intake structure. As a result, UWCD raised the intake tower sill to an elevation of 932.6 feet msl, 42 feet above the original sill elevation and approximately 29.5 feet above the elevation of the sediment at the time. The intent of the modifications was to extend the functional facility life by 30 years. The raised tower consisted of seven, 6-foot-long, sections of reinforced concrete pipe connected with pre-stressed reinforcing at each joint, and a conical trash rack at the sill. A cross-section of the raised intake tower is provided in Figure 2-9.

Following completion of the modifications, UWCD performed a bathymetric survey in 1977 and approximately every 10 years thereafter to monitor sediment accumulation in Lake Piru Reservoir. Based on the current estimated sedimentation rates, the sediment is projected to reach the existing intake sill sometime between 2023 and 2025 (Figure 2-9), at which point the intake tower will need to be raised or replaced in order to continue normal reservoir operations.

2.3.2 Outlet Works - Conduit

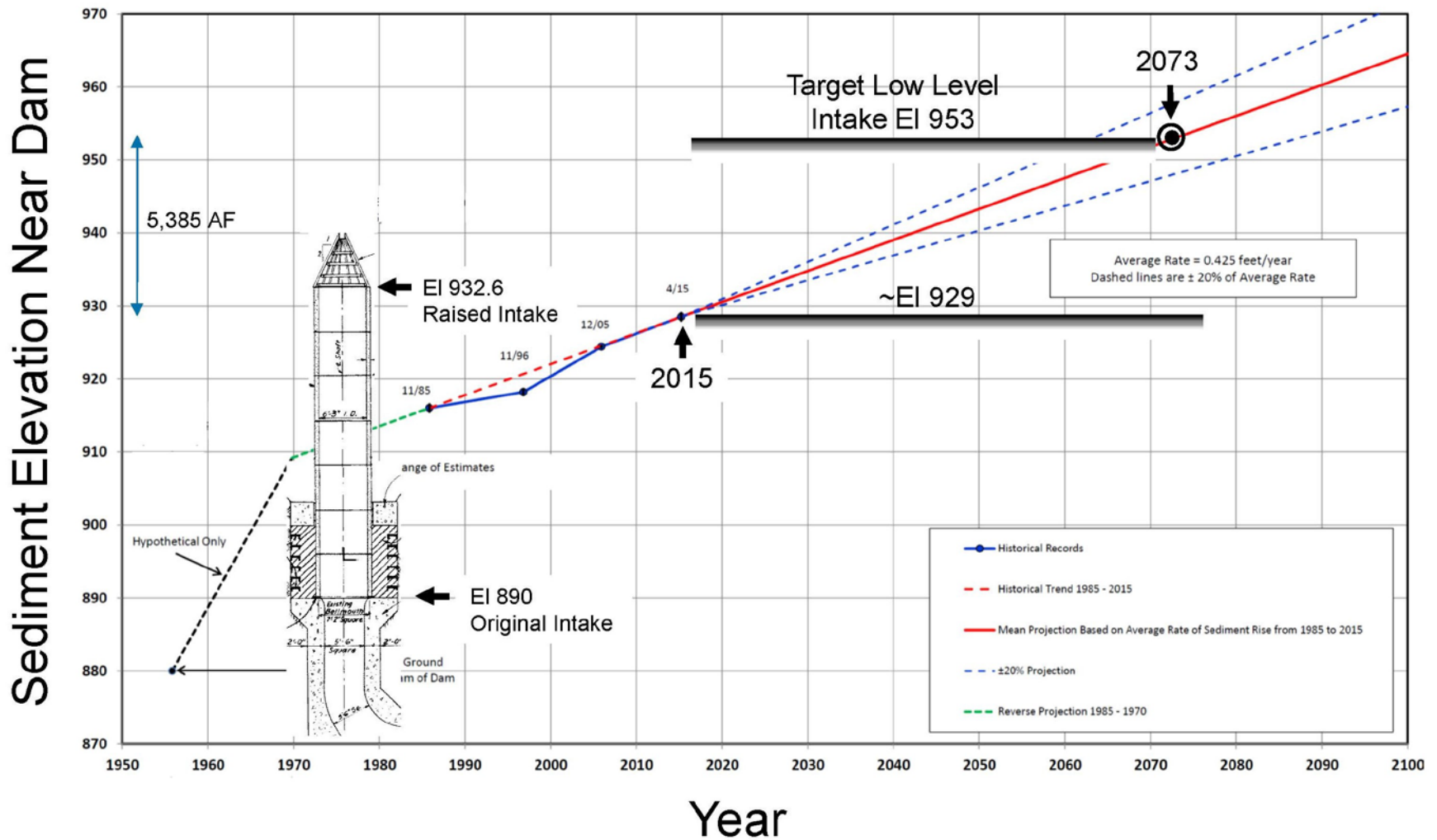
The outlet works conduit extends approximately 1,050 feet from the vertical intake tower near the upstream toe of the dam to the penstock outlet and hydroelectric power generation facilities immediately downstream of the dam. The conduit consists of two distinct sections: the upstream 66-inch diameter reinforced concrete pressure conduit, and the downstream 60-inch diameter steel penstock. These conduit sections are connected by a 72-inch hydraulically-operated butterfly valve that is situated in a reinforced concrete valve chamber.

2.3.2.1 *Upstream Concrete Pressure Conduit, Reinforced Concrete Valve Chamber, and Downstream Steel Penstock and Concrete Tunnel*

The upper 400 feet of the conduit consists of a pressurized, cast-in-place structural concrete section with a 66-inch inner diameter before entering the structural concrete valve chamber. The upstream 270 feet is founded on rolled pervious fill and the downstream 130 feet of the upper conduit is founded on bedrock.

The reinforced concrete valve chamber houses a 72-inch diameter hydraulically-operated butterfly valve that is bounded upstream and downstream by pipe reducers. An 8-inch diameter bypass pipe equipped with a self-lubricating plug valve and an 8-inch diameter butterfly valve is used to charge the 60-inch diameter penstock when the 72-inch diameter butterfly valve is closed.

Downstream of the valve chamber, the conduit cross-section transitions to an approximate 8.5-foot inner diameter horseshoe-shaped concrete tunnel with a 60-inch diameter steel penstock. During initial construction, the steel penstock received a mastic coating consisting of asphalt and asbestos fibers which is still present along the pipe (UWCD 1954). The annulus between the steel penstock and the concrete tunnel provides maintenance and operations access along the steel penstock and up to the valve chamber.



Source: GEI 2017a

Figure 2-9 Existing Intake Structure with Measured and Projected Sediment Accumulation Over Time

2.3.3 Outlet Works – Downstream Control Facilities and Powerhouse

The 60-inch diameter steel penstock bifurcates into dual 36-inch pipes at the downstream terminus prior to discharging into the outlet channel. Discharges through each pipe are controlled with 36-inch diameter cone valves mounted on the downstream end of the pipes. The original 36-inch diameter Howell-Bunger valves were replaced in 1996. Flows passing through the 36-inch diameter pipes discharge into the unlined stilling basin, the outlet channel, and lower Piru Creek. Discharge through the cone valves is shown in Figure 2-10 below.



Source: UWCD file photo September 2012

Figure 2-10 Conservation Release

UWCD added a hydroelectric generation facility at the downstream end of the steel penstock in 1987. Two Francis-type hydroelectric turbines with 1,216 kilowatt (kW) and 218 kW generation capacities, respectively, were installed in a powerhouse located approximately 30 feet east of the steel penstock near the penstock terminus. Discharge flow can be diverted to feed the turbines via a 36-inch-diameter penstock and a 16-inch-diameter penstock, both of which are controlled by turbine shut-off valves situated in the open pipeway near the 60-inch diameter steel penstock. Flows through the power generation facilities are discharged into a tailrace channel which directs flows into lower Piru Creek.

In addition to the discharge points associated with the 60-inch diameter penstock and the hydroelectric plant, two 12-inch diameter bypass pipes branch off of the 60-inch diameter penstock. The 12-inch diameter pipes have two discharge points. One of these locations is situated adjacent to the cone valves at the divided terminus of the penstock. Discharge from this location is controlled by a butterfly valve (referred to as the “West Valve”) and diffuser which were installed in 2005. Discharges from the West

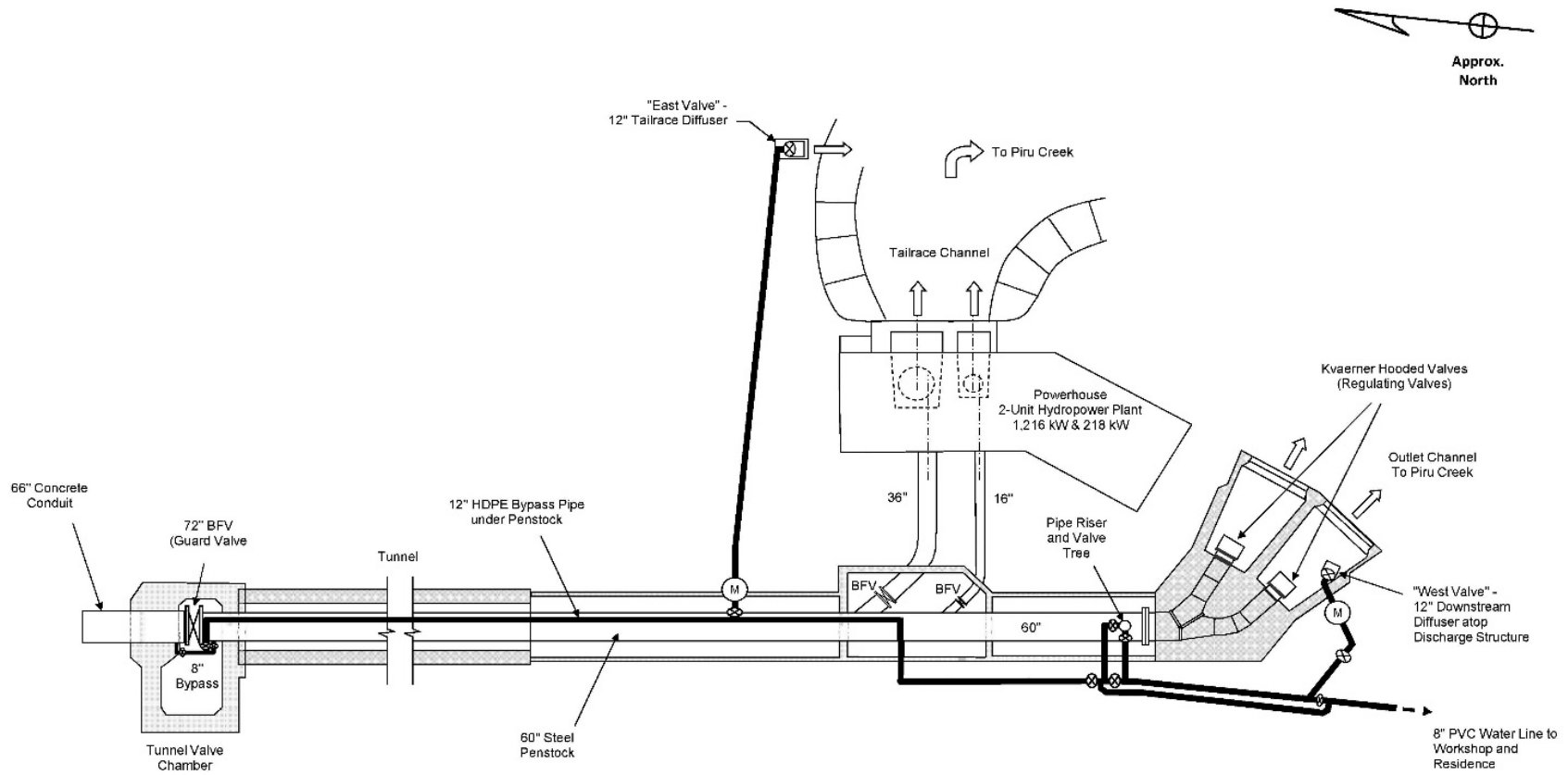
Valve enter the outlet channel and the unlined stilling basin. The other discharge location is east of the powerhouse and is controlled by a butterfly valve (referred to as the “East Valve”) and diffuser. The East Valve was installed in 2012. Discharges from the East Valve enter a tailrace channel that connects to the outlet channel, which then connects to lower Piru Creek. Each 12-inch valve has a maximum operating discharge up to 10 cfs, and they are used to control and convey water releases below 20 cfs. In 2012, a 12-inch diameter High Density Polyethylene (HDPE) bypass pipeline was installed in the penstock tunnel. The 12-inch bypass pipe is connected to the 8-inch diameter bypass pipe for the 72-inch diameter butterfly valve in the tunnel valve chamber. The HDPE pipe travels approximately 658 feet downstream and connects to the penstock and the two low flow release valves in the penstock pipeway. The HDPE bypass pipe is used to maintain the minimum water releases to lower Piru Creek during periods when the penstock is drained for inspections, maintenance, and repair. The West Valve can be seen operating in Figure 2-11.

A schematic of the existing downstream control facilities and powerhouse is provided in Figure 2-12.



Source: UWCD file photo December 2012

Figure 2-11 Low-Flow Release through the 12-Inch West Valve (the East Valve is shown in the foreground)



Source: GEI 2015b

Figure 2-12 Schematic of Existing Downstream Facilities

2.4 Lake Piru Reservoir Operation

The Lake Piru Reservoir is normally operated between an operational minimum pool of 20,000 AF storage and a maximum pool elevation of 1,055 feet msl, the spillway crest level. When the reservoir reaches capacity at an elevation of 1,055 feet msl, water discharges over the spillway and the reservoir becomes a pass-through facility where water inflow equals outflow. When the reservoir is below the maximum pool elevation of 1,055 feet msl, storage is available to capture inflows that exceed minimum streamflow requirements below the dam. The following subsections describe the regulatory requirements and standard operating procedures for Santa Felicia Dam and Lake Piru Reservoir.

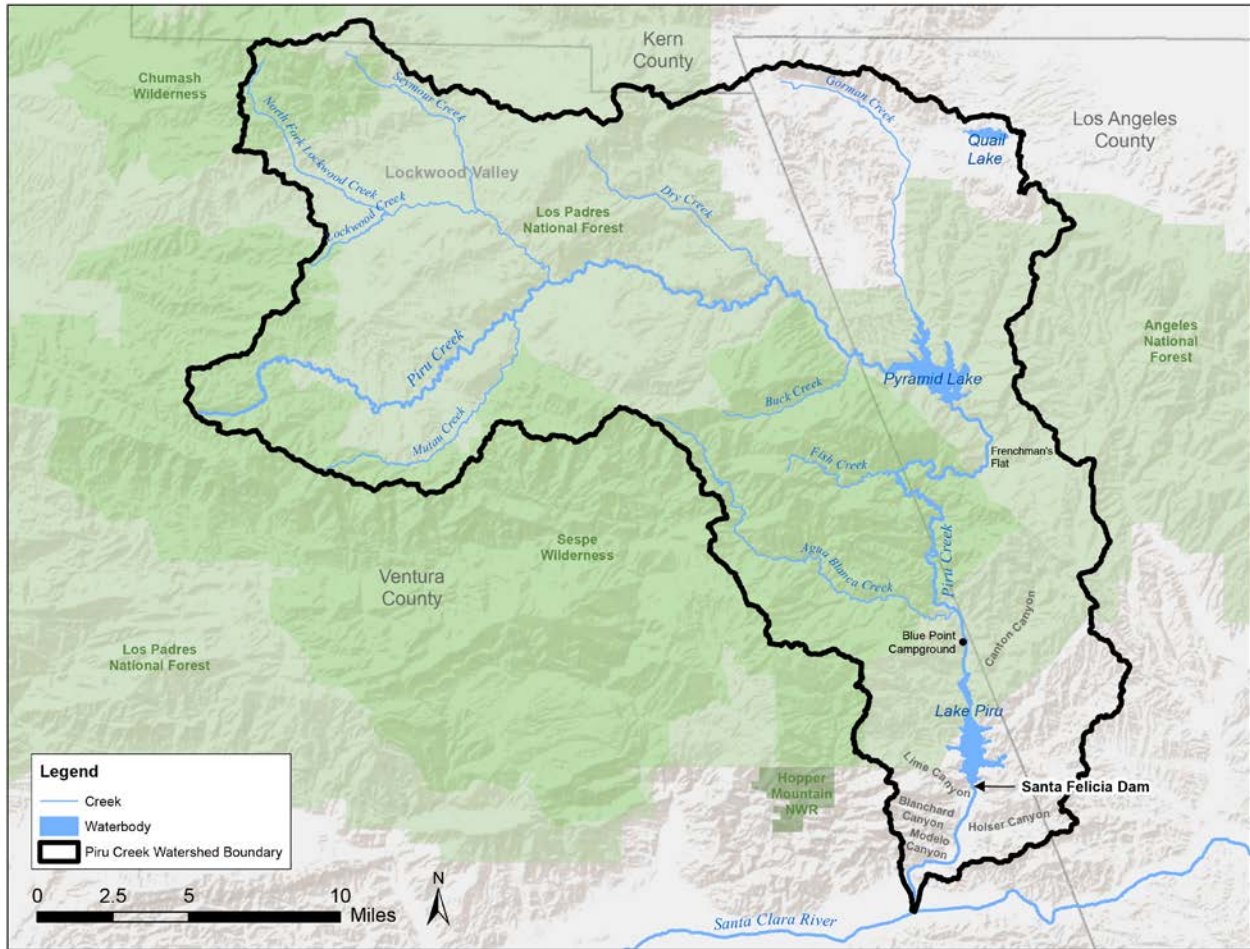
2.4.1 California Water Resources Control Board, Division of Water Rights License

UWCD was granted a License for Diversion and Use of Water from the SWRCB, Division of Water Rights that entitles UWCD to:

- > Impound up to 75,000 acre-feet per year (AFY) by surface storage in the Lake Piru Reservoir, to be collected from October 1 of each year to June 30 of the succeeding year.
- > The maximum withdrawal in any one year shall not exceed 71,300 acre-feet.
- > The maximum amount that can be held in storage at any one time shall not exceed 100,000 acre-feet.

The State license conditioned UWCD to monitor all inflows and outflows to and from the Lake Piru Reservoir. The inflow is monitored by the U.S. Geological Survey (USGS) at Blue Point (Station No. 11109600) which is located approximately six miles north (upstream) of Santa Felicia Dam. A series of high-precision magnetic flow and sonic meters measure the discharge through the penstock. Measured discharge from the magnetic flow meters is reported as USGS Station No. 11109800. USGS Station No. 11109800 also includes stage-height measurements from a weir located below the Santa Felicia Dam. Spillway discharges are calculated using a rating curve and elevations obtained by the USGS reservoir water surface recorder (Station No. 11109700) that is located on the upstream face of the dam. Inflow-outflow can also be calculated by measuring the daily change in reservoir surface elevation and storage.

Approximately two-thirds of the watershed above Santa Felicia Dam and the Lake Piru Reservoir passes through Pyramid Dam, which entrains Pyramid Lake (see Figure 2-13). The primary source of water to the Pyramid Lake is the California State Water Project (SWP). UWCD holds prior water rights to all water contributed to Pyramid Lake by natural drainage from the Piru Creek Watershed. The State of California Department of Water Resources (DWR), owner of Pyramid Dam, may appropriate natural inflows when water is passing over the Santa Felicia Dam spillway and the Freeman Diversion Dam located on the Santa Clara River, upstream of State Highway 118.



Source: USGS 2017

Figure 2-13 Piru Creek Watershed

2.4.2 Standard Operating Procedures

The general standard operating procedures for Santa Felicia Dam and Lake Piru Reservoir are as follows:

- > Impound and capture all storm water discharging down Piru Creek as permitted by the State of California in UWCD’s water rights license.
- > Conservation releases are conducted to achieve the water resource management purposes of the Santa Felicia Project. These water releases are conducted to enhance groundwater recharge, provide irrigation deliveries, and water for indirect municipal/industrial uses.
- > The quantity and rate of the water conservation releases in any given year is based on the groundwater conditions in the downstream basins and available storage behind Santa Felicia Dam. The discharge rate of these releases is typically between 300 and 400 cfs.
- > When the Lake Piru Reservoir reaches capacity, additional inputs of water to the reservoir discharge uncontrolled over the spillway, and the reservoir becomes a pass-through facility where outflow equals inflow.
- > Controlled releases through the cone valves or the powerhouse can be used to prevent minor discharges over the spillway. Operators are directed to operate the hydroelectric plant during periods of high surface water flows and spillway discharge. Discharges through the power plant may be restricted if storm runoff contains excessive debris that could damage the turbines.

- > UWCD has an annual allocation of 5,000 AF through the Ventura County Watershed Protection District (VCWPD). Water from the SWP is purchased on a yearly basis. Approximately 3,150 AF of UWCD's allocation is conveyed to Lake Piru Reservoir through releases from Pyramid Dam into middle Piru Creek. SWP deliveries via middle Piru Creek are limited to November through mid-March. Releases to middle Piru Creek are limited to natural flows from March through November during the arroyo toad breeding season.
- > The operating capacities and limitations for the controlled hydraulic release facilities at Santa Felicia Dam are summarized in Table 2-2.

Table 2-2 Hydraulic Capacities and Limitations

Discharge Point	Minimum Flow (cfs)	Maximum Flow (cfs)	Minimum Head/Lake Piru Reservoir Water Surface Elevation (feet msl)	Maximum Head/Lake Piru Reservoir Water Surface Elevation (feet msl)
60-inch Penstock Normal Maximum Discharge ¹	--	500	980	--
60-inch Penstock Absolute Maximum Discharge ¹	--	835 597	1055 980	--
36-Inch Cone Valves (2 valves) ²	40 cfs at 980' msl	500 cfs at 1,055' msl	--	--
Cone Valve (total)	80	500	--	--
Hydro Unit # 1 (max. output 218 kW) (rated output 164 kW)	10	20.3 (Max.) 17.1 (Rated)	--	1,055 (Reservoir Elev.)
Hydro Unit #2 (max. output 1,216 kW) (rated output 806 kW)	40	87.6 (Max.) 75.0 (Rated)	--	1,055
12-Inch Low Flow Butterfly Valve (West)	1	10.0	--	--
12-Inch Low Flow Butterfly Valve (East)	1	10.0	--	--
12-inch Butterfly Valve/Penstock Bypass Pipe (through 8-inch plug valve)	5	5	--	--

Notes:

1. The Normal Maximum Discharge and Absolute Maximum Discharge are for the modified intake tower configuration. Absolute Maximum Discharge is the discharge limit for a rapid release emergency drawdown.
2. The capacities shown are for independent operation. All devices share a common 60-inch diameter penstock and intake tower. Hence, head losses from combined operations can serve to reduce maximum discharges and/or reduce maximum head limitations.
3. Approximate elevation of the turbines and cone valves is 865 feet msl.
4. Spillway elevation is 1,055 feet msl.
5. Fixed intake tower elevation is 932.6 feet msl.
6. Minimum pool elevation is presently 980 feet msl. This provides lake surface buffer to preclude the delta from encroaching to the intake tower, thereby extending the life of the existing facilities. During the prolonged drought conditions between 2012 and 2016 the minimum water surface was approximately 964.2 feet msl.

2.4.3 Water Release Requirements Associated with FERC License for the Santa Felicia Hydroelectric Project

In addition to the general operating procedures, the 2008 FERC license for the Santa Felicia Hydroelectric Project (the existing dam facility) includes several environmental conditions and constraints that affect operations of Santa Felicia Dam and Lake Piru Reservoir. In response to the license conditions and the associated Biological Opinion issued to FERC by NMFS on May 5, 2008 for the endangered

southern California steelhead, UWCD prepared “The Santa Felicia Water Release Plan” that ensures the magnitude, timing, frequency, duration, and rate-of-change of water releases accomplish the following biological goals (UWCD 2012a):

- > Provide unimpeded migration of adult and juvenile steelhead in Piru Creek downstream of Santa Felicia Dam and in the Santa Clara River from the confluence of Piru Creek downstream to the Freeman Diversion structure.
- > Form and preserve freshwater rearing sites for steelhead throughout Piru Creek downstream of Santa Felicia Dam.
- > Create and maintain freshwater spawning sites (including incubation and emergence life stages of steelhead) for steelhead throughout Piru Creek downstream of Santa Felicia Dam.

To accomplish these goals, the Water Release Plan contains three water release schedules:

- > Habitat Water Release Schedule
- > Migration Water Release Schedule
- > Alternative Operations Water Release Schedule

Since its approval by NMFS in 2012, UWCD has operated Santa Felicia Dam in accordance with the Water Release Plan. The standard operation follows the habitat and migration water release schedules. However, under certain circumstances (e.g. during inspection, maintenance, and repair activities), UWCD would implement the alternative operations water release schedule. These water release schedules are discussed in more detail below.

2.4.3.1 *Habitat Water Release Schedule*

Beginning each October 1, UWCD is required to release a minimum flow of 7 cfs into Piru Creek below Santa Felicia Dam. In addition, UWCD records daily rainfall at the Ventura County Watershed Protection District (VCWPD) rainfall station #160 and maintains a running daily cumulative water-year-to-date total of rainfall.

On the first day of each winter month (January through June), the cumulative rainfall is compared to specified trigger values (Table 2-3, Column B). When the first-of-the-month cumulative recorded rainfall exceeds the corresponding date’s trigger value, the minimum release from Santa Felicia Dam is increased to a value no less than the wet-normal flow (Table 2-3, Column C) and maintained over the ensuing month. If the cumulative rainfall on the first day of any winter month (January through June) does not exceed the trigger value, the minimum required habitat water release is reduced to, or maintained at, 7 cfs until a subsequent trigger is met. Adjustments for flow increases are initiated no later than 10:00 a.m., and flow reductions are not implemented prior to 8:00 a.m. on the first day of each winter month (January through June).

Table 2-3 Habitat Water Release Schedule

A. When the cumulative annual rainfall at Ventura County Gage #160 measured at 8:00 a.m. on:	B. Exceeds the following trigger values:	C. Wet-normal year flow, Santa Felicia shall begin and continue releases for the ensuing period at a discharge no less than:
January 1	4.80 inches	15 cfs
February 1	8.10 inches	20 cfs
March 1	12.00 inches	20 cfs
April 1	14.90 inches	20 cfs
May 1	16.30 inches	10 cfs
June 1	17.50 inches	9 cfs which shall be continued through the following September 30 (October 1 begins a new Water Year.)

2.4.3.2 Migration Water Release Schedule

Between January 1 and May 31 each year, UWCD is required to release or bypass a minimum of 200 cfs during periods of time that fall between the flow initiation and flow cessation triggers.

2.4.3.2.1 Flow Initiation Trigger

If the instantaneous rainfall-induced discharge measured at US Geological Survey (USGS) Station No. 11109000 (Santa Clara River near Piru, California) at 8:00 a.m. exceeds 200 cfs, and the subsequent day's (midnight to midnight) mean daily discharge is predicted to exceed 200 cfs by the National Oceanic and Atmospheric Administration (NOAA) National Weather Service's "California – Nevada River Forecast Center" at River Guidance Point Piru SCPC1, then UWCD is required to increase discharges from Santa Felicia Dam before 10:00 a.m., in accordance with the ramping criteria to a value of no less than 200 cfs. If the forecast website has not yet been updated at 8:00 a.m., UWCD is required to check it on the hour, every hour, until it is updated, to determine if the trigger has been met. In this situation, if the trigger is met, UWCD is required to increase discharges from Santa Felicia Dam within two hours of forecast issuance.

2.4.3.2.2 Flow Cessation Trigger

When the mean daily rainfall-induced discharge measured at USGS Station No. 11109000 falls below 200 cfs, UWCD can begin decreasing discharges from Santa Felicia Dam, in accordance with the ramping criteria, to a flow no less than that dictated by the habitat water release schedule value.

2.4.3.3 Alternative Operations Water Release Schedule

In order to conduct dam safety activities (e.g., inspections, maintenance and repairs) that require closure of the penstock, discharge through the Santa Felicia Dam outlet works can be reduced to a minimum of 5 cfs. Ramping is to be conducted in the manner described in Section 2.4.4 (Ramping Rates for Water Releases) for habitat flow scenarios. Dam safety activities requiring closure of the penstock are to be scheduled to occur under the following conditions:

- > During any period when the reservoir spillway discharge exceeds the prescribed minimum flow.
- > Under habitat flow release periods when the minimum required flow is no greater than 9 cfs and no rain events that may result in initiation of migration flows are forecasted to occur.
- > Periods of reduced flow are limited as follows:

- Reductions for scheduled inspections are limited to no more than 12 hours.
- Reductions for scheduled maintenance or repair are limited to no more than 10 days per water year.
- > Periods of reduction are to be minimized by expediting all scheduled activities to the fullest extent practicable and minimum required habitat releases are to be restored at the earliest possible time. Such expedition will include lighting and around-the-clock activity should such effort shorten the expected duration of the flow reduction.

During this period of time, UWCD utilizes the 12-inch diameter HDPE bypass pipe and the water is released through one of the two low-flow discharge valves ("East" valve and "West" valve). UWCD must notify FERC, NMFS, and the SWRCB at least 15 days prior to any such reduction of flow expected to exceed 12 hours and must also notify FERC, NMFS, and SWRCB, within 24 hours should an intended 12-hour reduction period unexpectedly exceed 12 hours.

2.4.4 Ramping Rates for Water Releases

During periods of decreasing flows, UWCD is required to ensure that the flows are ramped down at a rate that does not decrease water surface elevations in lower Piru Creek by more than two inches per hour. This requirement does not apply to increasing flows. During those periods, UWCD is required to ramp up releases in incremental steps designed to avoid rapid increases in flows. The following ramping rates are specified to accomplish these goals.

2.4.4.1 *Habitat Flows*

Increasing Flows: Between January 1 and June 1 when increases in habitat flows are triggered, UWCD is required to increase discharge such that flow no more than doubles in any two-hour period.

Decreasing Flows: Between January 1 and June 1 when decreases in habitat flows are triggered, UWCD is required to ramp discharge down at a rate that does not exceed 2.0 cfs every 30 minutes until the new target habitat flow is reached.

2.4.4.2 *Migration and Water Conservation Flows*

Increasing flows: UWCD is required to increase discharge such that flow no more than doubles in any two-hour period.

Decreasing flows: UWCD is required to reduce discharge no more than 50 percent in any 24-hour period. The downward ramping shall stop, and discharges shall be stabilized, at flows no less than the appropriate habitat flow.

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3 PROJECT DESCRIPTION

The proposed Project consists of two components. The first component would replace the existing outlet works system to address the potential for failure under seismic loading conditions and impacts associated with sedimentation near the existing intake tower. Replacement of the outlet works modifications would also include installation of a new hydroelectric power plant. The second component would increase the conveyance capacity of the existing spillway to sufficiently pass the IDF, which for the Santa Felicia Dam consists of the PMF of 220,000 cfs. The Project does not include an increase in the capacity of the reservoir nor does it propose any changes to the current operations or flow releases from the dam presented in Section 2. Detailed information about each of the Project elements is provided below.

3.1 Project Component 1: Outlet Works System – Intake Structure, Conduit, Downstream Control Facilities, and Hydroelectric Plant

As described in Section 2, the existing outlet works system consists of an intake tower situated in the Lake Piru Reservoir, a flow conveyance conduit beneath the dam, and downstream control facilities situated on the right (west) side of the dam. A hydroelectric generation facility with a maximum capacity of approximately 1,454 kilowatts is located adjacent to the downstream flow control facility.

In 2015, UWCD conducted a study to evaluate potential options for placing the new outlet works system on either the west (right) or east (left) abutments of the dam (GEI 2015a). The proposed new outlet works system consists of four main facilities based on their function and general location: 1) an intake facility in the reservoir; 2) a water transmission conduit in a tunnel through one of the dam abutments; 3) downstream control facilities to route flows into lower Piru Creek; and, 4) a new hydroelectric plant. The study considered various tunnel alignments through each abutment as well as various options for intake facilities and downstream control facilities. Based on the results of the feasibility study, UWCD proposes to construct a completely new outlet works system through the east (left) abutment.

The study results also recommended the construction of an intake structure with multiple inlets and two independently operated flow release systems – a primary system for conservation, migration, and emergency releases and a low-flow bypass system for habitat water releases. The primary and low-flow conduits would have minimum diameters of 78 inches and 24 inches, respectively.

The design criteria for the outlet works system is described below, and is followed by descriptions of the design, construction, and operation of the intake structure, water transmission conduit, downstream control facilities, and hydroelectric plant. Finally, the anticipated sequencing of construction of the various outlet works components is described. The layout of the outlet works system and construction footprint are shown in Figure 3-1. The detailed description of design, construction, and sequencing (including equipment and workforce specification) is derived from the Constructability Report (GEI 2017a). The final design and construction of the facilities would be based on the results of site-specific geotechnical investigations and detailed hydraulic and structural analyses as the Project approaches final design.

3.1.1 Outlet Works Design Criteria

The main purpose of the new outlet works system is to allow UWCD to meet operational discharge requirements in a safe and reliable manner. The Project would not include any changes to the existing standard operating procedures for Santa Felicia Dam and Lake Piru Reservoir discussed in Section 2. Accordingly, Tables 3-1 and 3-2 summarize the key discharge and reservoir level parameters used in developing the design of the new outlet works:

Table 3-1 Key Design Parameters

Discharge Type	Discharge (cfs)	
	Primary-Flow System	Low-Flow System
Dam Safety Emergency Discharge ¹	1,327	153
Conservation Releases – Maximum	500	--
Conservation Releases – Minimum	30	--
Habitat Water Releases	--	7 to 20
Migration Water Releases	200	--
Alternative Operations Water Releases ²	--	5

1. Capacity of primary-flow system based on limiting velocities in 78-inch diameter conduit to allowable level. Capacity of low-flow system used to supplement discharges from the primary-flow system to meet emergency drawdown requirements.
2. The primary-flow system could be used in conjunction with the low-flow system for alternative operations water releases.

Table 3-2 Key Lake Piru Reservoir Level Parameters

Reservoir Level Parameter	Reservoir Elevation (feet msl)
Maximum Normal Pool	1,055 (Spillway Crest Elevation)
Minimum Normal Pool	980
Top of Future Dead Storage ¹	953

1. Dead storage represents the portion of the reservoir volume that is below the lowest intake elevation.

The maximum design discharge is 500 cfs. This maximum design flow is sufficient to meet UWCD's water resource management goals and all mandated water releases under the FERC license for the Santa Felicia Hydroelectric Project as discussed in Section 2.4. The ability to achieve the maximum design discharge will be dependent on the amount of water stored in Lake Piru Reservoir (i.e., head pressure). The normal minimum discharge is the lowest flow that may need to be delivered to lower Piru Creek through the primary outlet works system. The minimum required habitat water release required under UWCD's FERC license is 7 cfs (with the exception of 5 cfs for alternative operations under limited conditions). The design operational range for normal operations is 7 cfs to 500 cfs.

In addition to the normal operational range, the DSOD requires that the infrastructure be designed to achieve an emergency discharge rate capable of lowering the reservoir quickly in the event of a dam safety emergency; depending upon the water stored in the reservoir, the emergency discharge release would likely be greater than the maximum design discharge of 500 cfs. DSOD's criterion for reservoirs that impound over 5,000 acre-feet of water is that new outlet works systems must be capable of lowering the maximum storage depth by 10 percent within 7 days¹ and draining its full contents within 90 days. For Santa Felicia Dam, the new outlet works system would have to lower the reservoir 13 feet (10 percent) within 7 days, from 1,055 feet msl (spillway crest) down to 1,042 feet msl. This translates into a release of 14,710 acre-feet in 7 days, or 1,480 cfs (comprised of 1,327 cfs from the primary-flow system and 153 cfs from the low-flow system) for temporary/interim emergency situations.

¹ Previous drawdown evaluations (GEI 2012) were based on a 10-day criterion because this is often allowed by DSOD for existing outlet works systems connected to large reservoirs. The previous evaluation indicated a maximum capacity of the existing outlet works system equal to about 835 cfs, resulting in approximately 9.25 days to lower the maximum reservoir depth by 10 percent.

3.1.2 Intake Structure

3.1.2.1 Intake Structure Design

The main function of the intake structure is to draw reservoir water into the discharge conduits, while blocking the entry of large debris and preventing the passage of protected fish. The intake structure would be located on the left (east) side of the dam and consist of either a sloping intake structure or an intake tower, described below. The type and magnitude of impacts associated with both the sloping intake and intake tower options are similar; where different, such as in the case of noise, these options are analyzed separately.

Sloping Intake Option

The sloping intake option would consist of a reinforced concrete mat resting on a slope that is excavated in bedrock, a short approach channel from the reservoir, intakes in the concrete mat at four levels, pipes that connect to 78-inch and 24-inch diameter conduits in a tunnel, valves, and a control building. The two-level intake system would allow UWCD to selectively withdraw water at either intake level, and thus allow for better management of water quality in the discharges to lower Piru Creek relative to the current single-level intake tower.

A conceptual site plan of the intake facility and associated local access to the facility is provided in Figure 3-2. Schematic profile, plan, and section views of the intake facility are shown in Figures 3-3, 3-4, and 3-5, respectively. The general attributes of the proposed intake structure construction are as follows:

- > Rock cuts would be made to create an approach channel and 45-degree slope for the reinforced concrete mat which would provide the foundation for the intake structure. Side slopes of the rock cut would be at 45-degrees and covered with shotcrete for erosion protection. Consideration will be given during final design to flattening the side slopes to eliminate the need for shotcrete protection.
- > Two primary intakes would be constructed for selective withdrawal of reservoir water, one at elevation 953 feet msl and the other at elevation 970 feet msl. Flow from each intake would enter the 78-inch-diameter primary conduit. Each intake would be formed by two 12-foot by 12-foot openings in the concrete mat allowing reservoir water to enter concrete-lined trenches that are connected with a pipe. The capacity of each intake would be 530 cfs (two openings combined). The two openings of each intake would straddle the north and south sides of the concrete mat resting on the slope. Intakes would be opened/closed with knife gate valves via stems (steel rods) connected to operators located at elevation 1,080 feet msl (on dry ground).
- > Two movable fish screens would be installed, one on each side of the sloping intake. Each fish screen would be one-half of a cylinder with a height and radius of approximately 17 feet and 8 feet, respectively. Fish screens would be raised periodically to a control building at elevation 1,080 feet msl (see below) using wire ropes and a winching system for cleaning and maintenance.
- > Each 12-foot by 12-foot intake opening would be protected with a trash rack to prevent large debris from entering the outlet works system when the fish screens are not in place.
- > A low-flow intake would be constructed, consisting of a small fish screen connected to the 24-inch diameter steel conduit. The fish screen would be detachable for cleaning at the surface. The low-flow intake would be opened/closed with a knife gate valve via a stem connected to an operator at elevation 1,080 feet msl.

For normal operations, one intake level (two side-by-side 12-foot by 12-foot openings) would be opened at a time. A fish screen would be positioned above each opening to allow for conveyance of the normal maximum discharge of 500 cfs. For emergency dam safety releases, all four openings would be used to allow for discharge of up to 1,060 cfs. Fish screens would not be positioned above the openings during emergency dam safety releases.

The control building would be located on an access pad constructed at elevation 1,080 feet msl (Figure 3-2). The access pad would be constructed by cuts into bedrock and include an access ramp from the existing access road. Additional rock cuts would be made to realign the existing access road above the intake for a distance of about 320 feet to allow for construction of the access pad and ramp. The realigned access road would lessen the sharpness of the horizontal curve around the rock abutment, and thus provide better sight distances than the current access road. The control building would be used for raising and lowering fish screens, cleaning of fish screens, and operation of the intake valves. Power lines would be constructed to the control building for operation of electrical equipment. The power would be supplied by the new hydroelectric power plant and would likely connect via an underground conduit. The final size and capacity of the service connection would be determined by Southern California Edison (SCE).

Intake Tower Option

The intake tower option would generally consist of a triangular-shaped reinforced concrete structure. Two faces of the tower would be open to the reservoir and the back face would be attached to a vertical rock cut supported by an anchored wall system. A plan view of the intake tower is provided in Figure 3-6 and schematic section views are provided in Figure 3-7. The general attributes of the intake tower option construction are as follows:

- > Rock cuts would be made to create a relatively long approach channel and a vertical rock face that would be used for support of the tower. The vertical rock face would be supported by a reinforced concrete wall anchored to the rock mass with an array of long steel bars grouted into sub-horizontal holes drilled into the rock. The length and number of the anchor bars would be determined during the final design process. Side slopes of the approach channel would be at 45 degrees and covered with shotcrete for erosion protection.
- > A total of four intakes, two on each outer face of the tower, would be constructed for selective withdrawal of reservoir water. Intakes would be at elevations 953, 970, 990, and 1,010 feet msl. Each intake would be formed by approximately 4-foot-wide by 6.5-foot-high openings in the tower faces. Intakes would be opened/closed with gates via stems (steel rods) connected to operators located in a control building at the top of the tower.
- > Two movable fish screens would be installed, one on each outer face of the tower. Each fish screen would be one-half of a cylinder with a height and radius of approximately 17 feet and 8 feet, respectively. Fish screens would be raised periodically to a control building at the top of the tower using wire ropes and a winching system for cleaning and maintenance.
- > Each intake would be protected with a trash rack to prevent large debris from entering the outlet works system when the fish screens are not in place.
- > Flows through the intakes would enter a wet well to convey flows to the base of the tower and into the 78-inch-diameter conduit which would be controlled by a gate.
- > An independent low-flow intake would be incorporated in the tower (this would be a variation of that shown in Figures 3-6 and 3-7).

For normal operations, one intake on each face could be opened at a time. A fish screen would be positioned over each open intake and would allow for conveyance of the normal maximum discharge of 500 cfs. For emergency dam safety releases, two or more intakes on any face would be used to allow for discharge of up to 1,060 cfs. Fish screens would not be positioned above the intakes in the event of emergency dam safety releases. Access to the control building at the top of the tower would be via an access pad constructed at elevation 1,080 feet msl similar to the sloped intake option.

Fish Screens

As part of ongoing efforts associated with the 2008 FERC license and the associated Biological Opinion issued by NMFS on May 5, 2008, UWCD is conducting pre-implementation actions in pursuing a fish passage program for the Santa Felicia Dam. Due to the possible future presence of steelhead in the reservoir, the proposed intake structure would likely require fish screens. The fish screen requirements have not yet been formally established. However, for feasibility level assessment of proposed intake structure alternatives, UWCD used the following assumptions for design of the fish screens, which are derived from NMFS (1997) and CDFW (2010):

- > Fish screens would be required for the design operational flow range (all flow below the maximum design flow of 500 cfs).
- > Fish screens would not be required for dam safety emergency discharges, but a portion of emergency discharges may be passed through fish screens, if appropriate.
- > In accordance with NMFS criteria (NMFS 1997):
 - the maximum screen opening would be 0.25 inches;
 - the effective (open) area of the screen would be equal to or greater than 40 percent of the gross area of the screen;
 - the maximum approach velocity would be 0.8 feet per second for all flow conditions.
- > A cleaning system would be required to prevent clogging of screens by suspended debris, and to remove quagga mussels, which are current present in Lake Piru Reservoir.
- > Trashracks would not be required to protect fish screens, given the low approach velocity around the screens.

UWCD would determine the final details of the fish screen system in later phases of design, following finalization of the criteria required for fish protection and consultation under Section 7 of the ESA with NMFS.

Floating Boom in Reservoir

The Project would also include a floating trash and debris boom in front of the dam, spillway, and intake facility. The boom would reduce the risk of large floating debris affecting the performance of the spillway and outlet works, and act as a safety barrier between the dam and boaters. Floating booms with a suspended curtain (typically 2 to 4 feet deep curtain) have been used at many dam sites to trap floating debris and provide protection of spillway and outlet works facilities. These types of booms are well-suited for slow-moving waters, which is typically the case at Santa Felicia Dam. The floating boom at Santa Felicia Dam would have a length of approximately 1,700 feet, spanning between the east and west shorelines, and would be situated approximately 500 feet upstream of the dam.

3.1.2.2 Intake Structure Construction Considerations

During construction, the proposed intake location on the left side of the dam would be accessed via existing access roads and/or via the reservoir. The existing access roads to the upper left abutment area include the dam crest road and an unpaved access road along the left side of the dam. The access road along the left side of the dam would be improved to allow construction vehicles to travel to/from the dam crest and the downstream berm. These improvements include placement of fill materials to flatten the grade of the road as well as widening it, as shown in Figures 3-1 and 3-2.

Construction access to the lower portion of the intake structure would be via an access road constructed in the gently sloping drainage located immediately north of the intake structure location (Figure 3-1).

Materials could also be transferred to and from the lower portion of the intake structure using cranes situated on dry land above the site or from a barge in the reservoir adjacent to the site.

For efficient construction of the intake structure, the reservoir would be lowered to approximately 950 feet msl or lower. The existing rock at the entrance to the discharge channel would be left in place to act as a temporary berm (cofferdam) to reduce the risk of flooding of the construction area due to rising reservoir levels during and following a storm. Additional measures to increase the height of the cofferdam would be considered during final design, such as placement of fill material and installation of cutoff walls. The cofferdam would be removed following completion of the lower portion of the intake structure.

The spoil material from excavations would be hauled to the downstream side of the dam and used to increase the height of the existing berm. The excavated material may also be used as fill to improve the existing access road along the left side of the dam embankment.

3.1.3 Water Transmission Conduit

The Project would include the installation of a 78-inch diameter steel conduit and a 24-inch diameter low-flow steel conduit to convey flows from the base of the intake structure to the downstream control facilities. These conduits would be installed in a tunnel that would be constructed through the left (east) abutment of the dam. Water releases greater than approximately 20 cfs would be conveyed through the 78-inch-diameter conduit and water releases below approximately 20 cfs would be conveyed through the 24-inch-diameter conduit.

The tunnel would be approximately 1,400 feet long and follow an alignment with curved and straight sections as shown in Figure 3-1. The tunnel would penetrate shale and sandstone units of the Monterey Formation, and have floor elevations ranging from approximately 880 feet msl at the downstream end to approximately 950 feet msl at the upstream end. The slope of the tunnel floor would be approximately 5.0 percent. An approximate profile of the tunnel is shown in Figure 3-8. The tunnel would be horseshoe-shaped with dimensions of approximately 12 feet high by 12 feet wide as shown in Figure 3-9.

The tunnel would be advanced using conventional “roadheader” and/or “drill and blast” methods, depending on the character of rock to be excavated. A roadheader is a piece of excavating equipment consisting of a boom-mounted cutting head mounted on a crawler. The cutting head operates at the rock face of the tunnel’s path. The drill and blast method involves drilling a predetermined pattern of holes to a selected depth in the rock face of the tunnel’s path, filling the holes with explosives such as dynamite, and detonating the explosives causing the rock to crack and break apart. For both tunneling methods, the debris or muck (spoil) dislodged at the face would be hauled out of the tunnel. Other tools such as a pneumatic drill or hand tool would be used in smoothing out the surface of the rock, as needed. A temporary support system would then be installed, depending on the character of the rock to be supported.

These tunneling methods allow for full access to the tunnel face at all times and the tunneling activities can be modified to adapt to variable ground conditions, as needed, which reduces construction risks. Spoil from the tunnel would be added to the stabilizing berm at the downstream toe of the dam. The annular space between the steel conduits and tunnel wall would be filled with cellular concrete.

Sandstone and shale bedrock at the Project site generally has low permeability based on investigations performed for construction of the dam. Consequently, groundwater can travel through these strata within interconnected fractures or bedding planes that have a more porous structure. In addition, water from Lake Piru Reservoir can enter the abutment bedrock, thus feeding the groundwater flow. Occurrences of seepage in bedrock tunnels are anticipated to primarily be along open fracture planes in the bedrock and increase with proximity to the reservoir. Groundwater inflows to the tunnel would be controlled or prevented to allow for efficient construction.

3.1.4 Downstream Control Facilities and Hydroelectric Plant

The Project would include the construction of new downstream control facilities on the left side of the dam, immediately downstream of the toe berm as shown in Figure 3-1 and 3-10. The downstream control facilities would include a primary discharge system to release conservation, migration, and emergency release flows and a low-flow bypass system to release minimum habitat and alternative operational flows as shown in Figure 3-11. The facilities would also include a new hydroelectric plant.

The downstream control facilities would be placed on a new, compacted earthfill pad with an approximate surface elevation of 900 feet msl. The main access to the new facilities would be via the existing paved and unpaved access roads which would be improved following demolition of the existing downstream control facilities on the right side of the dam. The unpaved access road along the left side of the dam, which would be improved as part of the Project, would allow UWCD personnel to travel a short distance between the intake facility control building and downstream control facilities.

The primary flow releases would be conveyed through the 78-inch diameter steel conduit. Two regulating and energy dissipation valves would be installed at the downstream end of the conduit to regulate the water releases. The valves would consist of two fixed-cone valves similar to the current system. Having two fixed-cone valves allows for redundancy in the event of malfunction of one valve, and also extends the low-flow operational range. The system would also include a butterfly valve on the 78-inch-diameter conduit. The butterfly valve would be used to close the conduit if the regulating valves were to fail.

In general, the low-flows required for habitat releases would be conveyed through the 24-inch diameter steel conduit. The low-flow (bypass) discharge facilities would share a similar footprint as the primary downstream control facilities but would consist of an independent system. The low-flow bypass system would essentially be a smaller version of the primary flow system.

In order to ensure continuous water releases, a system must be in-place to convey these releases when the independent low-flow bypass is shut down for inspection or maintenance. This redundancy would be accomplished via a pipeline tap into the downstream end of the primary outlet conduit, together with ancillary piping and valves, to allow water releases to be made via the primary conduit when needed.

The Project would include the construction of a new hydroelectric plant adjacent to the new downstream control facilities. The new plant would be comparable to the existing facility with regard to generating capacity but optimized for efficient power generation.

All discharges from the downstream control facilities and hydropower plant would enter a new approximately 200-foot long discharge channel lined with riprap immediately downstream of the release point. Portions of the riprap would be grouted to increase its resistance to erosion. Flows from the fixed-cone valves would spray into the open air, with high velocity flows landing within the riprap discharge channel. The discharge channel would then transition to an unlined channel connecting it to the existing lower Piru Creek channel. The release channel would be designed to meet the requirements specified in mitigation measure BIO-4, which are part of license condition compliance activities.

Prior to constructing the new channel to connect the new outlet works release point to the main lower Piru Creek channel, the final design of the channel would be reviewed and approved by NMFS as well as other appropriate state and federal regulatory agencies through Section 7 consultation. Technical Assistance has been provided by NMFS during the development of this EIR, and the proposed conceptual design (fully developed in Section 5.5, Biological Resources, MM BIO-4) is feasible and anticipated to bound the range of options that would be considered in Section 7 consultation.

The downstream facilities would also include construction of power lines for connection to the hydroelectric plant and for operation of electrical equipment. The existing polyvinyl water line to the workshop and residence at the site would be extended to the new downstream control facility and tap into both the primary and low flow conduits.

Following the commencement of operation of the new outlet works, UWCD would cease operation of the existing outlet works and would proceed with abandoning the existing infrastructure. The existing tunnel and conduit would be filled with cellular concrete and the existing control facilities would be demolished with the area regraded to match surrounding conditions. The termination of water releases from the existing outlet works will result in the dewatering of between 480 feet and 1,200 feet of existing channel in lower Piru Creek (depending on the final design) that is situated between the existing outlet works and the confluence of the discharge channel associated with the new outlet works. Irrigation would be provided for the existing riparian vegetation along the portions of the existing lower Piru Creek channel that would be abandoned to maintain the existing riparian habitat for least Bell's vireo, southwestern willow flycatcher, and other species.

3.1.5 Outlet Works System Construction Information and Sequencing

The Constructability Report (GEI 2017a) provides detailed descriptions of construction information and sequencing; a summary is provided in this section. Construction of the outlet works system would require lowering of the reservoir. The normal (historic) operating range of the reservoir is from elevation 980 feet msl to 1,055 feet msl; however, during periods of drought, historic water surface elevations in Lake Piru Reservoir have decreased to below 980 feet msl. To allow for efficient construction of the new intake facilities, the reservoir would be lowered to elevation 950 feet msl, or lower. Lowering of the reservoir allows for more efficient tunnel construction, as special underwater tunneling techniques would not be required.

Placement of the new outlet works facilities on the left abutment allows the existing outlet facilities on the right side of the dam to remain operational during construction. The existing outlet works would be used to maintain license-mandated water releases during the construction period as well as maintain the ability to lower the reservoir in the event of a large storm and eliminate the need for a portable pumping system to supplement water releases. Based on the findings of the Santa Felicia Dam Safety Improvement Project; Hydrological Risk Analysis (UWCD 2018a), it is anticipated that sufficient water would be available to maintain the mandated habitat and migration flow releases during the construction period for the new outlet works.

The location of construction staging areas and spoil disposal area are shown in Figure 3-1. This figure also shows the approximate location of the temporary access road to be used for construction of the intake structure, and Figure 3-12 shows the road improvements to existing access road along the slope adjacent to the left abutment. These improvements include placement of fill materials to flatten the grade of the road and widen it. The grade of the existing access road is approximately 40-percent in places, and the improved access road will have a grade no steeper than 25-percent, allowing for safer access. Additional improvements to the access road would include installation of drainage control structures, paving of the surface with asphaltic concrete, and installation of guard rails.

The following summarizes information on the anticipated construction equipment and work force:

- > Construction activities would generally be performed in five, 8-hour work shifts (40 hours) per week on weekdays during daylight hours. However, certain tasks may require that work be conducted more than 8 hours per day (extending into night shift work) and weekends.
- > Erosion protection during construction will follow required permit conditions and Best Management Practices (BMPs).
- > Large-sized truck trips would be scheduled during off peak hours as feasible.
- > Clearing and grubbing of trees and shrubs would be performed along new access roads, within excavated areas, and at potential stockpile and spoil areas.

- > A temporary bridge would be placed across lower Piru Creek at the location of the existing low-flow crossing to allow heavy construction equipment to travel to the downstream, left side of the dam. Temporary access roads would be constructed as needed to allow access for intake facility, tunnel, and downstream facility construction.
- > Excavations of rock for construction of the intake facility and realignment of the access road above the intake facility would primarily be performed using drill and blast techniques, dozers with rippers, loaders, excavators, and dump trucks.
- > Excavations for improving the access road on the downstream, left side of the dam would be performed using conventional excavation equipment, with incidental drilling and blasting of rock. Fills for construction of this access road would be placed and compacted using conventional earthmoving and compaction equipment.
- > Excavated materials would be processed and used as structural fill or disposed of on site in a designated spoil area located on the existing downstream toe berm.
- > Water for dust control, moisture conditioning of soils for compaction, and other incidental construction uses would be obtained from Lake Piru Reservoir.
- > The tunnel would be advanced for approximately 50 percent of its length using a road header, and approximately 50 percent of its length using drill-and-blast techniques.
- > All steel pipe to be installed in the tunnel would be transported to the tunnel portals using semi-trailer trucks.
- > Conventional concrete for the intake facilities, downstream control facilities, hydroelectric plant, and ancillary structures would be obtained from existing commercial concrete plants and the concrete would be transported to placement areas at the site using 8-cubic yard ready-mix concrete trucks.
- > Cellular concrete to fill the annular space between the steel pipe and tunnel walls, and for abandonment of the existing outlet works, would be obtained from existing commercial concrete plants and transported to the site in 8-cubic yard ready-mix concrete trucks.
- > Building, electrical, and mechanical materials and equipment would be delivered to the site with semi-trailer trucks.
- > Demobilization would include removal of all contractor facilities, equipment and materials from the site once all field work is completed.
- > Reclamation of the site prior to final demobilization would follow required permit conditions and BMPs.

The general construction sequence for the outlet works construction is anticipated to be the following:

1. Drawdown reservoir to elevation 950 feet msl or lower, if possible. Maintain full operational capability of existing outlet works system until completion of Item 13.
2. Mobilize construction equipment to the site.
3. Perform excavations (mainly rock) to realign existing access road and construct access pad on left abutment, on south side of intake facility. Construct temporary access road (haul road) in reservoir area to base of proposed intake facilities.
4. Perform excavation (mainly rock) for inclined intake facility or intake tower. For intake tower option, install anchored, reinforced concrete wall to support vertical rock face as excavation proceeds.
5. Leave rock in place at entrance to approach channel to act as a temporary cofferdam.
6. Improve access road along the left abutment of the dam, from the downstream berm to the dam crest

7. Perform tunneling from downstream portal, daylighting into the base of the rock excavation for the intake facility. Time the tunneling to daylight at the beginning of the dry season, to reduce the risk of overtopping the cofferdam by inflows to Lake Piru Reservoir.
8. Install steel conduits in the tunnel from the downstream portal. Fill the annular space between conduits and tunnel with cellular concrete, delivering concrete from the upstream end to reduce formation of air gaps in the annular space.
9. Temporarily block conduits in the event of a sudden rise in reservoir level.
10. Construct intake facilities and use permanent guard valves or bulkheads to effect conduit closures.
11. Remove temporary rock cofferdam at entrance to approach channel. Reclaim the temporary haul road in the reservoir area.
12. Construct new downstream control and hydropower facilities, including the discharge channel.
13. Fill the reservoir to a level that will allow the new outlet works facilities to meet habitat water release requirements and begin use of the new outlet works facilities.
14. Abandon original intake structure and conduit. Fill the existing tunnel and conduit with cellular concrete, demolish existing downstream control facilities, and regrade the demolished area.
15. Demobilize equipment and temporary facilities and reclaim site.

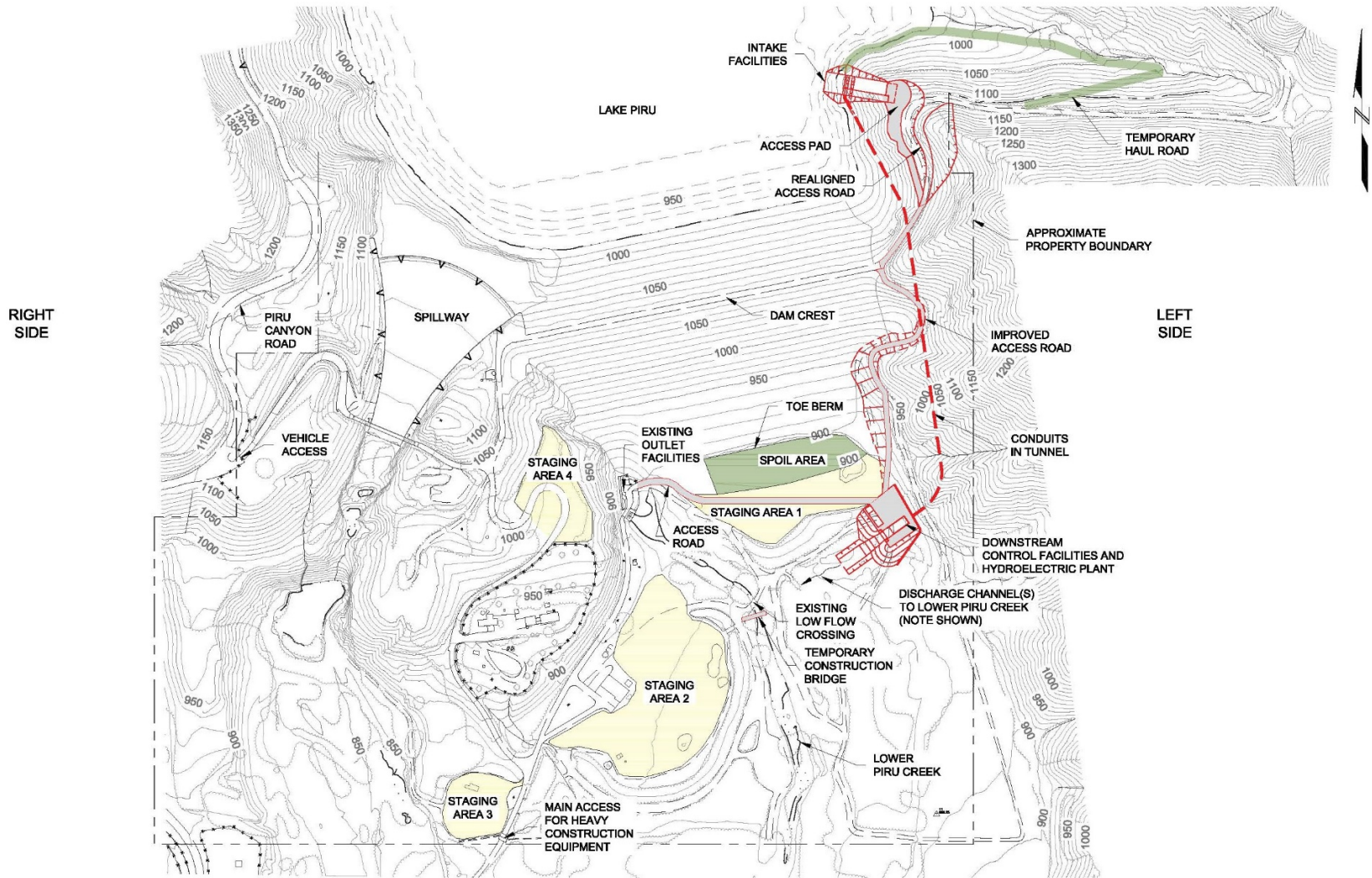
Several elements of the construction sequence would overlap for efficiency.

3.1.6 Outlet Works Construction Schedule

The outlet works construction activities would be conducted prior to the spillway modification component of the Project. Construction of the sloped intake option is estimated to require approximately 24 months to complete as shown in Figure 3-13, and construction of the intake tower option is estimated to require approximately 36 months to complete as shown in Figure 3-14. The general construction phases and their timing are provided in Table 3-3 below.

Table 3-3 Outlet Works Construction Phases and Timing

Construction Phase	Timing	
	Sloped Intake Option	Intake Tower Option
Mobilization	Month 1	Month 1
Access Roads and Pad	Months 1-7	Months 1-7
Intake Facility Excavation	Months 3-5	Months 3-9
Tunnel Excavation	Months 3-9	Months 3-9
Tunnel Pipe Install	Months 9-13 (would occur during the dry season)	Months 9-13 (would occur during the dry season)
Inclined Intake Facility Components	Months 13-20	Months 13-26
Downstream Facility Excavation and Components	Months 13-21	Months 15-24
Remove Intake Facility Cofferdam	Months 16-17	Months 26-28
Fill Reservoir to Low Flow Intake Level	Months 17-21 (would occur during the wet season)	Months 28-33 (would occur during the wet season)
Abandon Existing Outlet Works	Months 21-23	Months 33-35
Demobilization and Reclamation	Month 24	Month 36

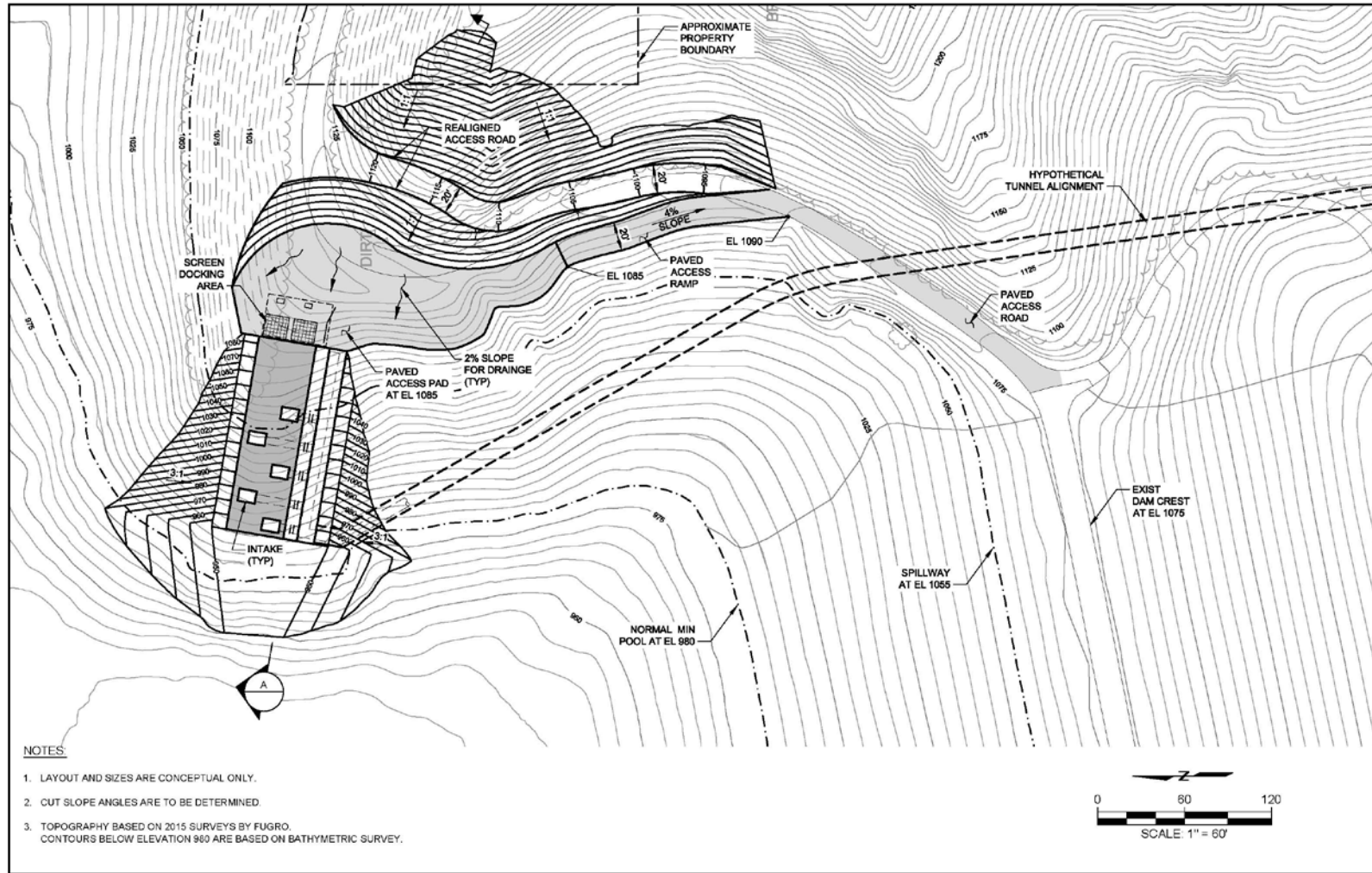


- NOTES:**
1. LAYOUT AND SIZES OF NEW FACILITIES ARE CONCEPTUAL ONLY.
 2. TOPOGRAPHY BASED ON 2015 SURVEY BY FUGRO.



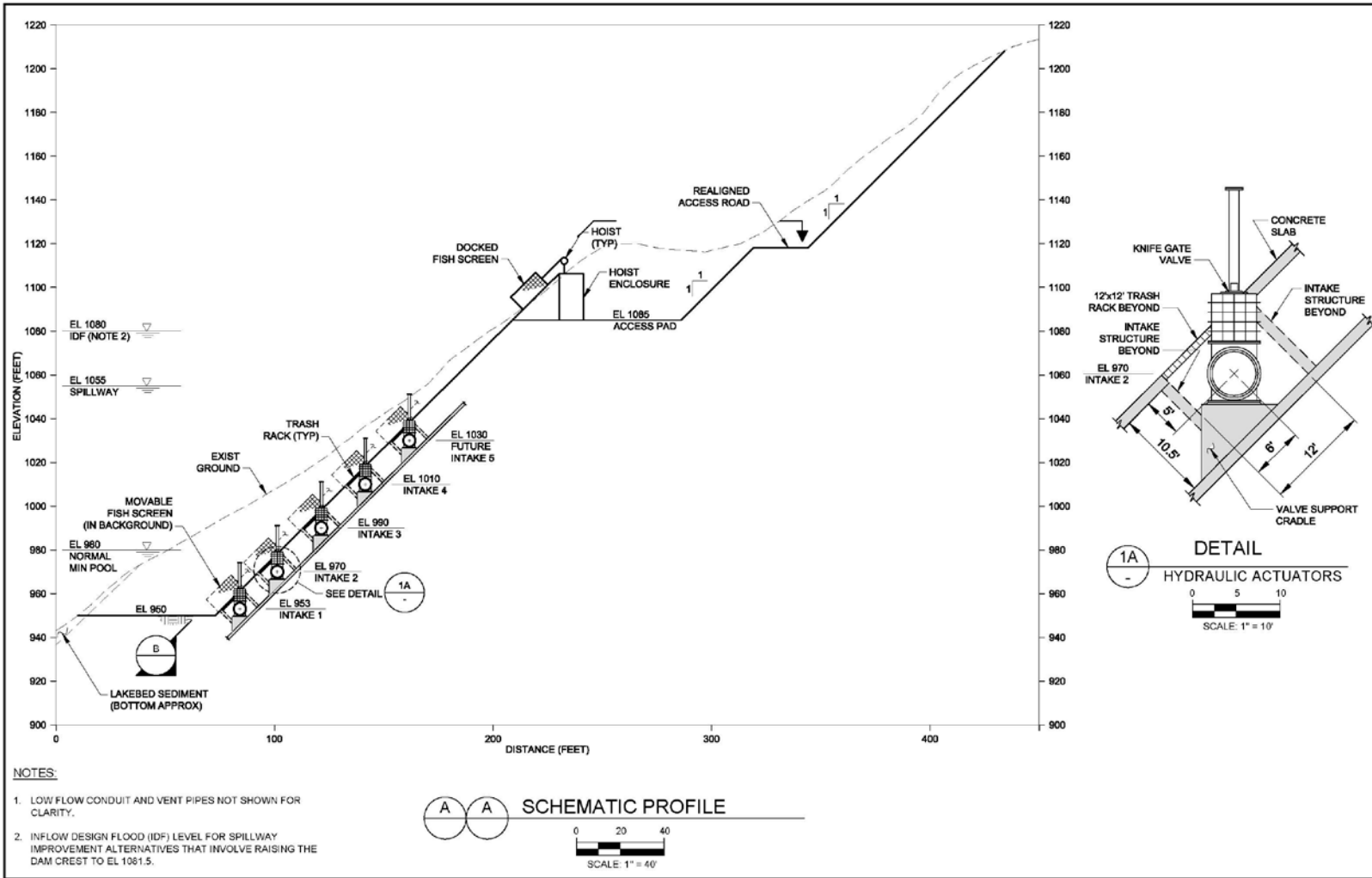
Source: GEI 2017a

Figure 3-1 Outlet Works System Layout and Construction Footprint



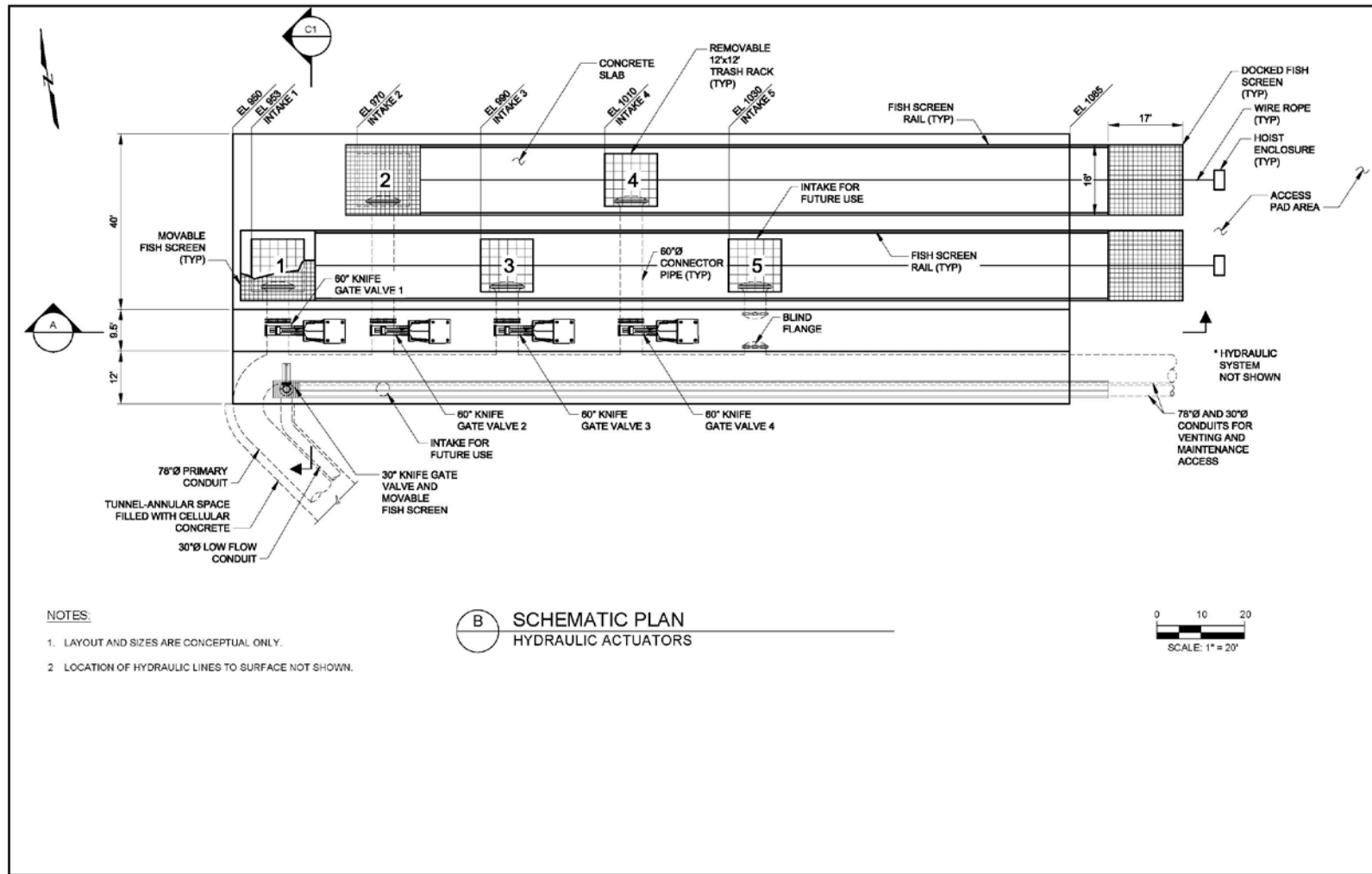
Source: GEI 2018

Figure 3-2 Sloping Intake Structure Plan View



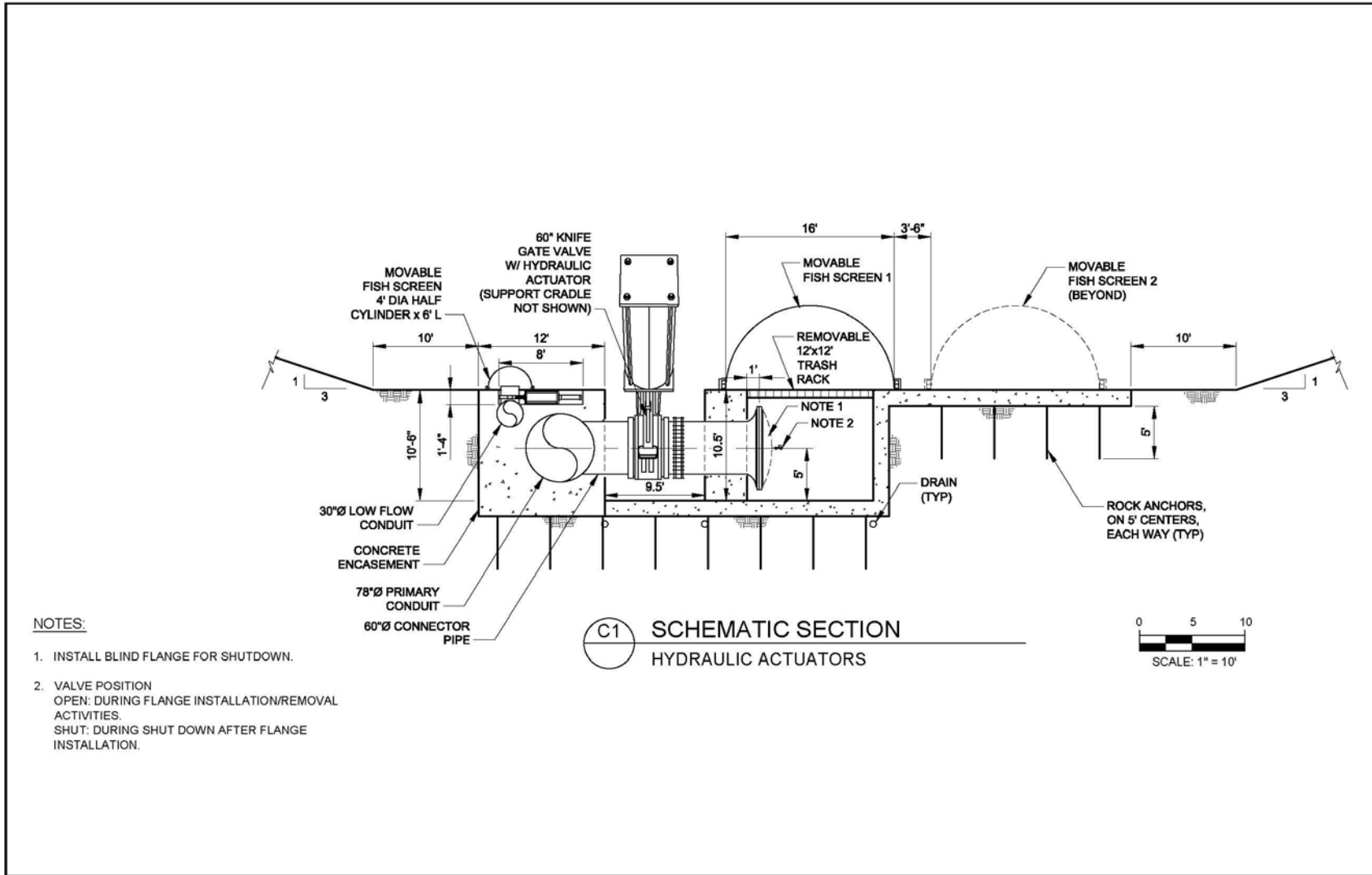
Source: GEI 2018

Figure 3-3 Sloping Intake Structure Profile



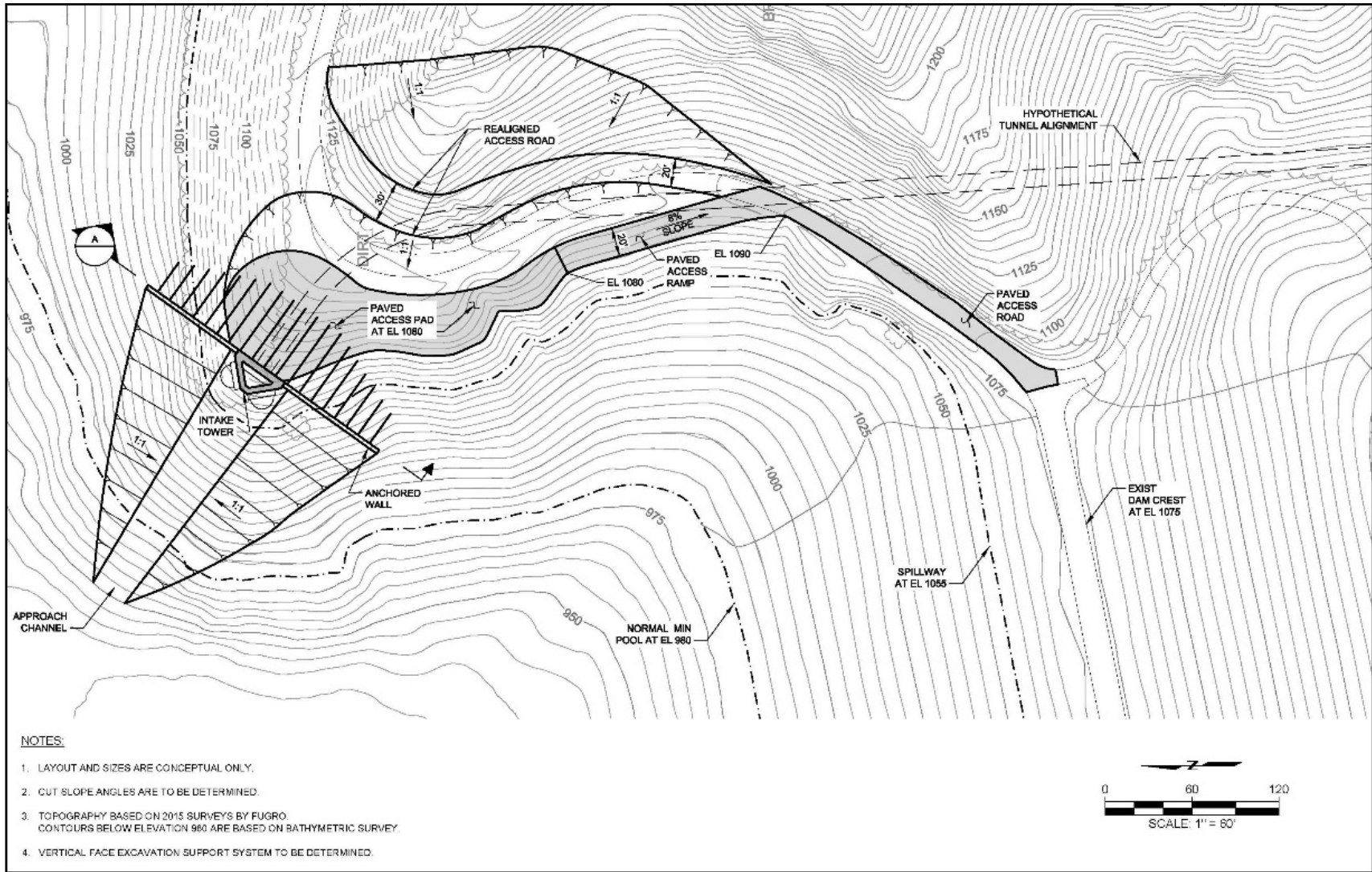
Source: GEI 2018

Figure 3-4 Sloping Intake Schematic Plan



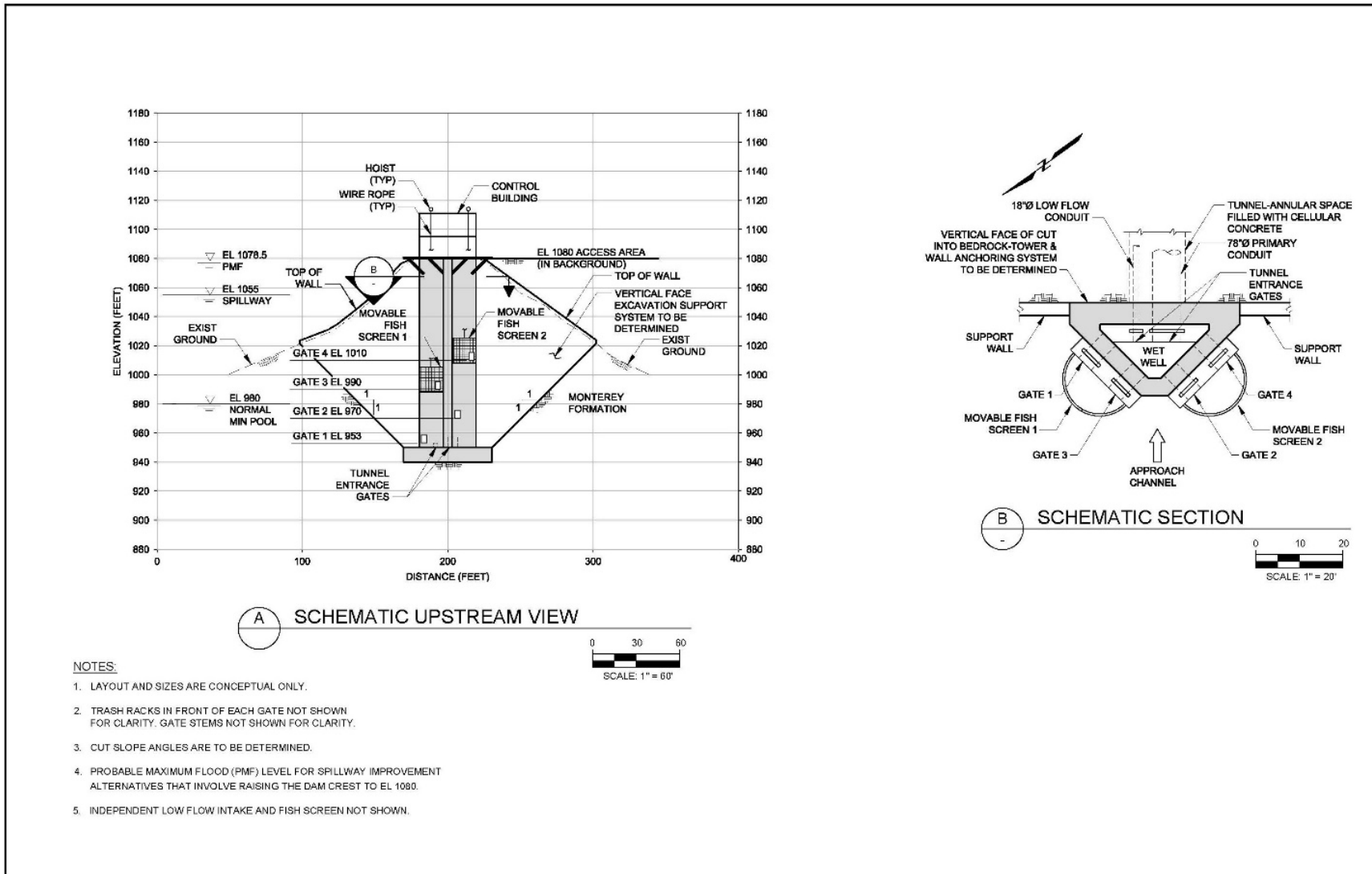
Source: GEI 2018

Figure 3-5 Sloping Intake Schematic Section



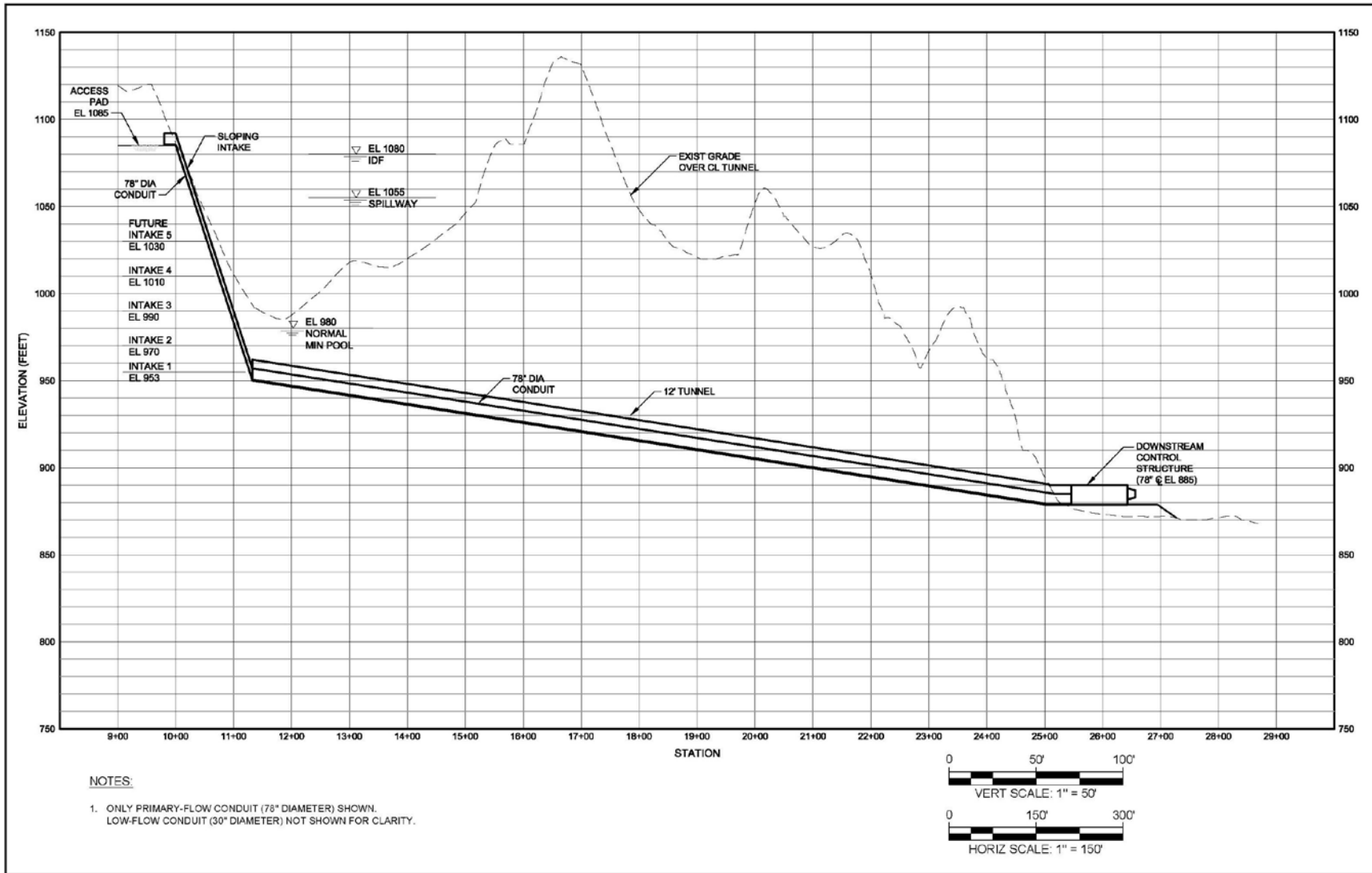
Source: GEI 2017a

Figure 3-6 Intake Tower Plan View



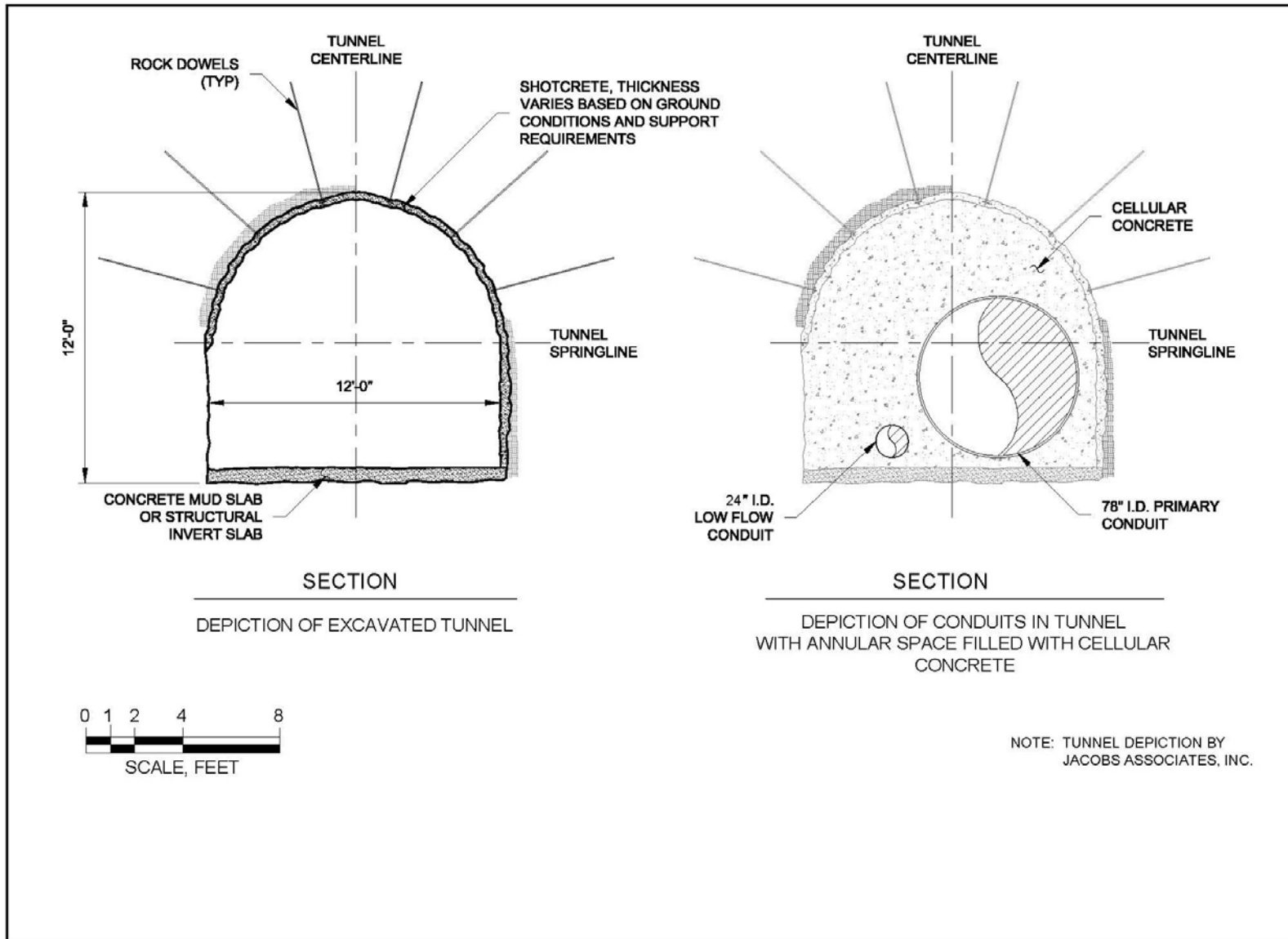
Source: GEI 2017a

Figure 3-7 Intake Tower Schematic Section View



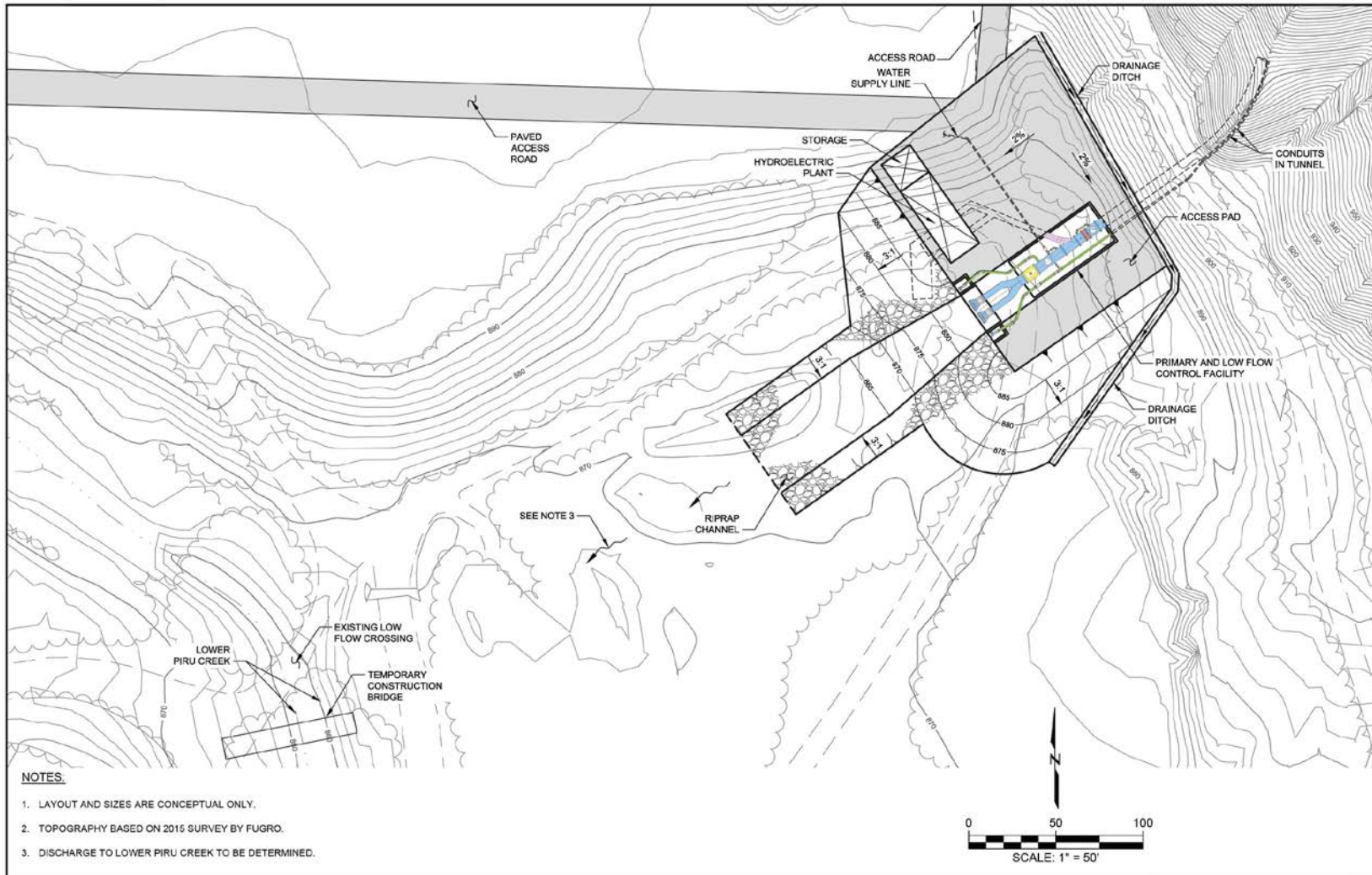
Source: GEI 2018

Figure 3-8 Left Abutment Tunnel Profile



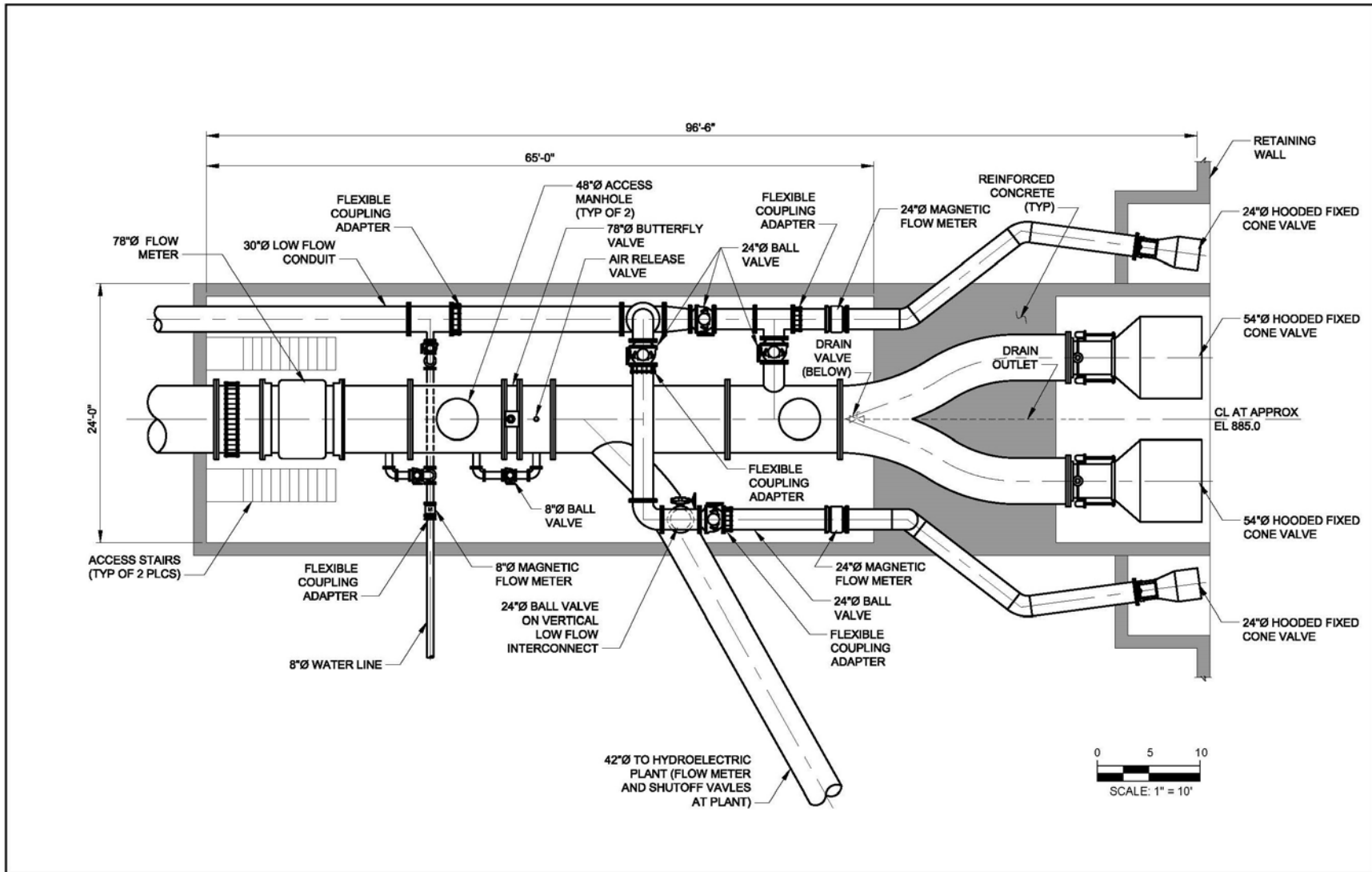
Source: GEI 2017a

Figure 3-9 Schematic Depiction of Tunnel Cross-Section



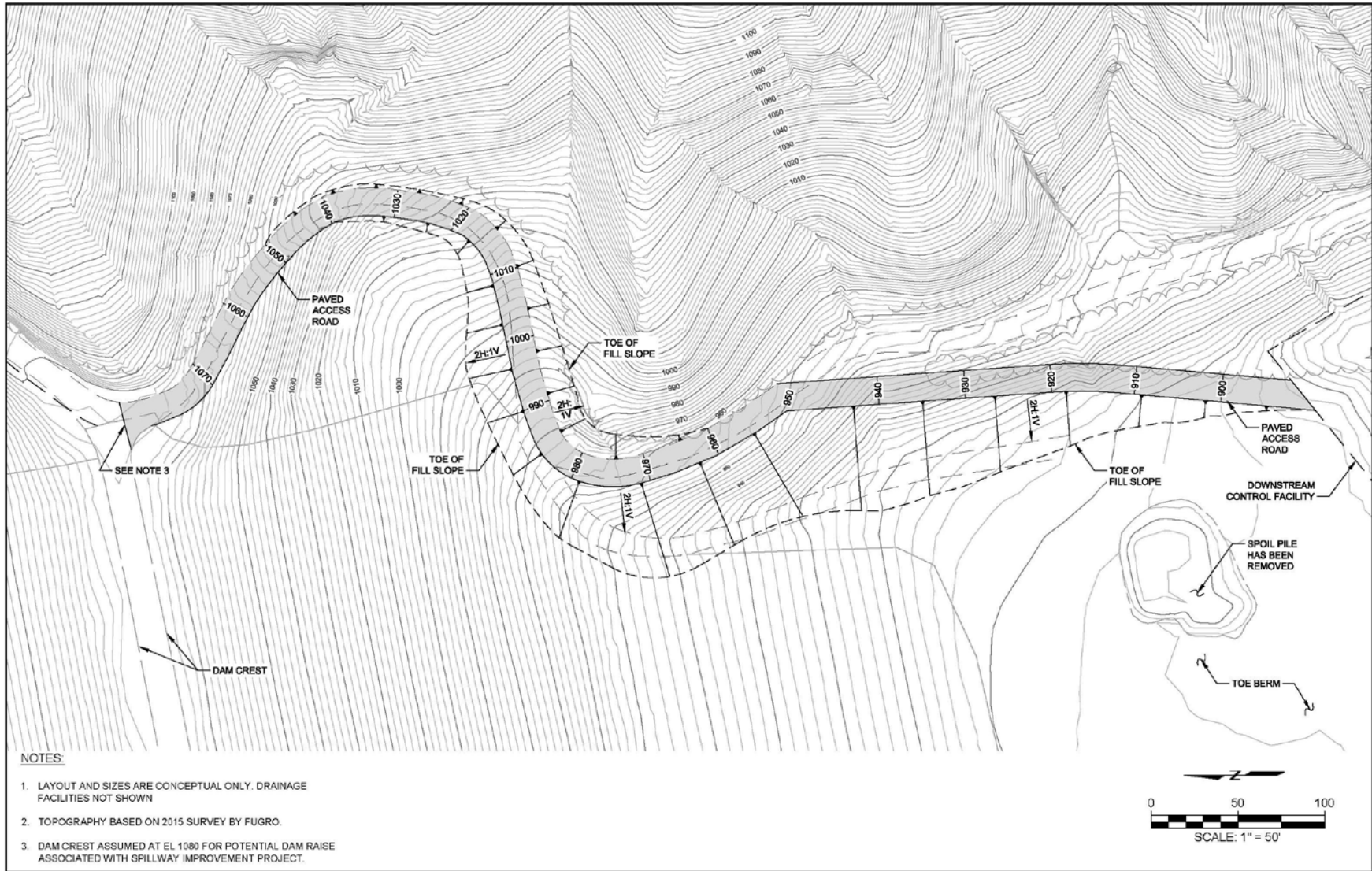
Source: GEI 2017a

Figure 3-10 Downstream Control Facility Site Plan



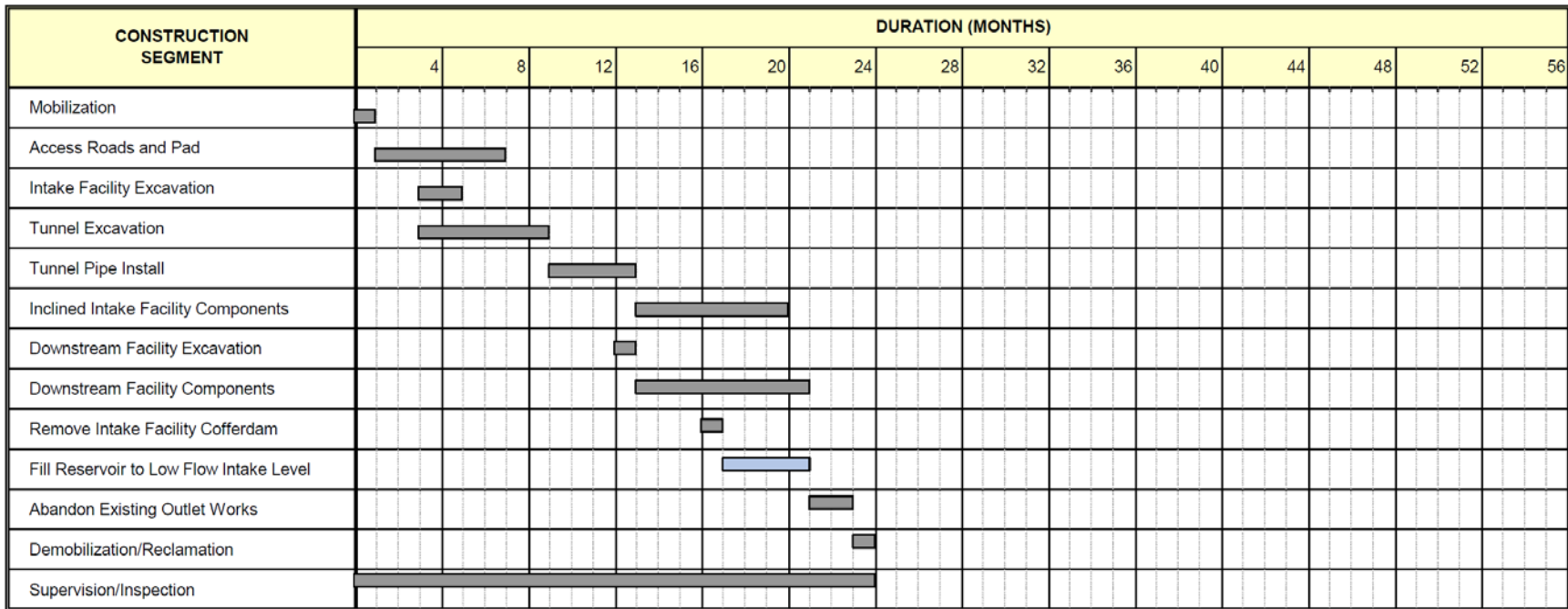
Source: GEI 2018

Figure 3-11 Downstream Control Facility Layout



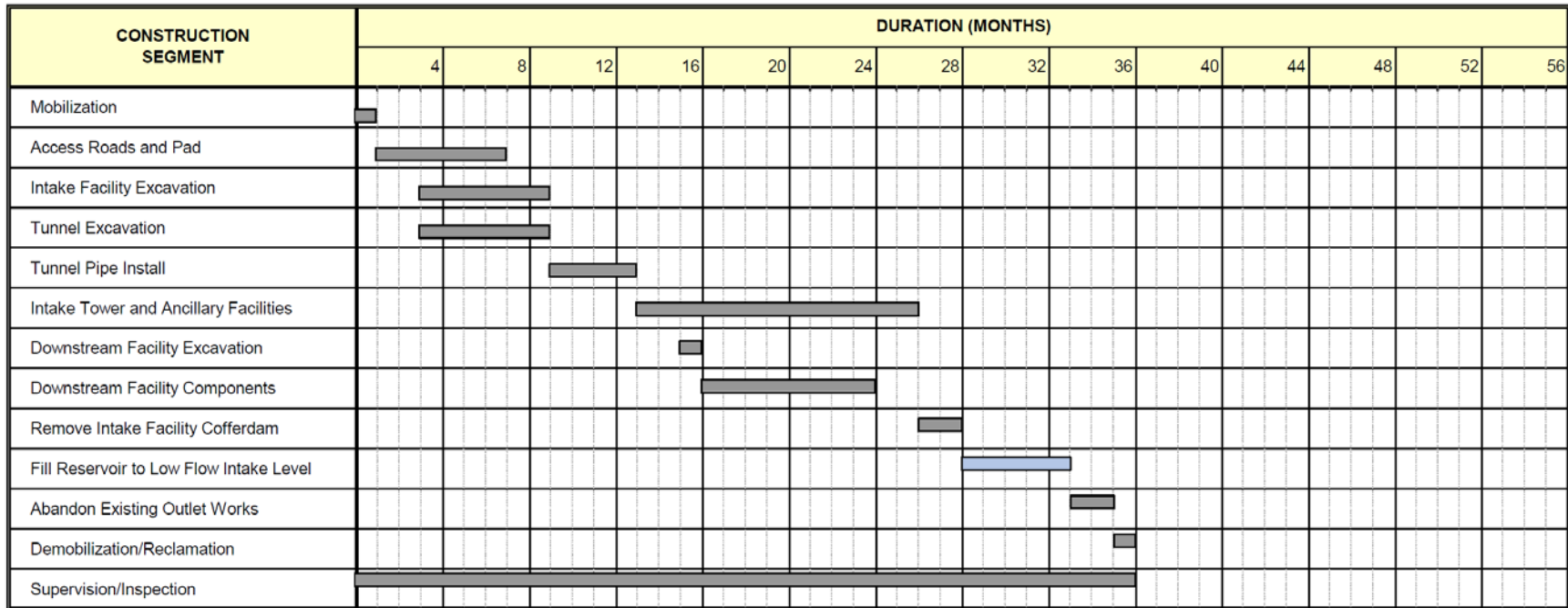
Source: GEI 2017a

Figure 3-12 Proposed Improvements to Access Road Along Slope Adjacent to Left (East) Abutment



Source: GEI 2017a

Figure 3-13 Estimated Construction Schedule for Outlet Works with Sloped Intake Option



Source: GEI 2017a

Figure 3-14 Estimated Construction Schedule for Outlet Works with Intake Tower Option

3.2 Project Component 2 – Increase Spillway Capacity

The purpose of the spillway is to provide for the safe release of floodwaters once the reservoir is at its capacity, thus preventing flows from overtopping the dam. The existing spillway is located immediately west of the dam (adjacent to the right abutment) within a natural topographic feature that was modified during construction by excavation into bedrock to accommodate the crest structure and spillway chute. The spillway consists of an ungated ogee crest² and a funnel-shaped reinforced concrete chute. Downstream of the chute, an unlined rock discharge channel conveys flows to its confluence with lower Piru Creek, approximately 0.7 mile downstream of the Santa Felicia Dam outlet works facilities.

The current spillway capacity was designed to comply with applicable design criteria at the time of construction. The 1955 “maximum possible flood” was determined using the U.S. Weather Bureau’s Hydrometeorological Report (HMR) No. 218. Santa Felicia Dam was designed to pass a maximum flood of 105,000 cfs with 5 feet of freeboard below the dam crest elevation of 1,075 feet msl.

Construction of Pyramid Dam by DWR required UWCD to update the Santa Felicia Dam IDF and spillway capacity. As a result, in 1973, the PMF inflow increased to 162,400 cfs and the PMF outflow increased to 160,400 cfs. To accommodate the larger PMF, UWCD constructed a three-foot-high parapet wall on the dam crest and portions of the spillway walls were raised to prevent overtopping from wave action and wave run up.

In 1998, the National Weather Service Hydrometeorological Office published HMR Numbers 58 and 59 which replaced prior guidance as the method to estimate the Probable Maximum Precipitation (PMP) in California. Following issuance of HMR 58 and HMR 59, UWCD conducted a series of studies to update the IDF and PMF for Santa Felicia Dam. In 2013, DSOD conducted an independent analysis based on a modified HMR 59 methodology that incorporated the rainfall data from the NOAA Atlas 14. The results of the DSOD analysis indicated an IDF of 220,000 cfs for Santa Felicia Dam. This value was subsequently confirmed and approved by UWCD in 2015. The FERC accepted the 220,000 cfs as the minimum level of risk reduction.

Following concurrence and approval of the updated IDF for Santa Felicia Dam, UWCD conducted a study to evaluate potential options for increasing the spillway capacity to convey the updated IDF of 220,000 cfs (GEI 2015b). The results of the study recommended increasing the spillway capacity through a combination of raising the dam crest and either widening the spillway chute or lowering the spillway floor while retaining the existing ogee crest as shown in Figures 3-15 and 3-16, respectively. The layout and construction footprints for the spillway widening option and the spillway deepening option are provided in Figures 3-17 and 3-18, respectively. Note that the final construction footprint for both options may change slightly during final design; the environmental analysis is intended to consider the maximum extent of construction impact in order to bound the potential effects.

Raising the crest of the dam would not result in an increase to the working capacity of the reservoir; rather, there would be no change to the existing operations or the existing ranges in water levels in Lake Piru Reservoir (described in Section 2). Based on the available hydrologic record, the probability of occurrence of the updated IDF of 220,000 cfs is approximately 0.05 percent in any given year (approximately once every 2,000 years).

For context, the estimated 500-year peak inflow to Lake Piru Reservoir is 146,400 cfs (which is 3.7 times the inflow of the January 10, 2005, storm event) and the estimated 100-year flood is 68,800 cfs. The maximum flow recorded over the spillway crest was 28,800 cfs on February 25, 1969. Accordingly, the probability of occurrence of the updated IDF is extremely low, so the modifications to the dam crest would not impact existing operations or resources in the Project area. However, if the approximately 2,000-year

² An ogee spillway forms a part of the dam itself and has control structures that consist of ogee-shaped crests (crests that are S-shaped when viewed in profile in profile)

recurrence interval flow represented by the updated IDF did occur, then the Piru Creek watershed would be effectively flooded with various impacts that are unrelated to the increase in the dam crest elevation.

3.2.1 Spillway Modification Design Criteria

The following criteria and assumptions were used in developing the design for the increase in the spillway conveyance:

- > Residual freeboard on Santa Felicia Dam would be at least 1.5 feet during the IDF, consistent with DSOD guidance. However, this freeboard allowance may be increased based on FERC, DSOD, and/or Board of Consultants recommendations.
- > Freeboard allowance on the spillway chute walls during the IDF would follow U.S. Bureau of Reclamation criteria.
- > The preferred location for discharge of spillway flows is to the deeply incised rock channel downstream of the existing spillway chute.
- > The crest elevation of Santa Felicia Dam could be raised using mechanically stabilized earthfill (MSE) walls on the crest.

3.2.2 Spillway Construction Description

Both Project options (widening or deepening of the spillway chute) include increasing the elevation of the existing dam crest. The dam crest would be raised 6.5 feet to an elevation of 1,081.5 feet msl using MSE wall as shown in Figure 3-19. The MSE wall would extend the entire length of the dam crest (approximately 1,150 feet) and would be approximately 25 feet wide. The wall would be embedded approximately three feet into the existing dam crest and extend 6.5 feet above the existing dam crest. The upstream and downstream edges of the wall would be constructed of one-foot-thick concrete blocks that are set back from the edges of the existing dam crest. Engineered fill would be placed between the concrete walls with geogrid reinforcement every two feet with a minimum of eight-foot embedment. The wall would be capped with gravel.

The widening of the spillway chute option involves the following construction activities:

- > Demolishing the west chute wall and widening the chute approximately 160 feet at the downstream end as shown in Figures 3-15, 3-17, 3-20, and 3-22. An estimated 72,000 cubic yards of material would be excavated from adjacent slope to facilitate the widened channel assuming a final cut slope of 1.5H:1V (horizontal to vertical proportion). The temporary cut slope for construction of the new west chute wall would be excavated at 0.25H:1V with backfill to the top of the new chute wall. The new channel would be lined with concrete to match the existing channel lining and the new training wall would also be constructed of concrete. The training wall along the eastern bank of the spillway would remain. In addition, the vertical alignment of the spillway would be the same as the current alignment.
- > Realigning the access road along the western bank to accommodate a longer bridge across the downstream end of the chute as shown in Figures 3-15, 3-17, 3-20, and 3-22. The existing access road would be moved downslope (to the south) and a new approach slab would be constructed for the bridge. The upslope side of the road would be graded to a 1H:1V slope and the downslope side would be graded to 0.5H:1V slope that would be stabilized with soil nails and facing. The existing access road would be backfilled with spoils from the realignment construction. The existing access road along the eastern bank would remain.
- > Constructing a new 260-foot long bridge as shown in Figure 3-23. To facilitate the spillway widening, the existing bridge pier and the existing bridge abutment along the western bank would be demolished. A new bridge pier would be installed along the western bank of the widened spillway chute. A new bridge abutment and a new, curved bridge segment would be constructed along the western bank. The new curved section would consist of steel girders with a reinforced concrete deck.

The existing bridge segment would be removed, and a new, post-tension box girder bridge span would be placed across the widened spillway channel. The existing approach, bridge pier, and bridge abutment along the eastern bank would remain.

- > Realigning the access from the Powerhouse and outlet works valve structure area to the raised dam crest.

The deepening of the spillway chute option involves the following construction activities:

- > Demolishing the existing spillway chute invert from approximately Station 12+00 to the downstream end of the existing chute (approximately Station 15+75) and lowering the existing invert 15 feet as shown in Figures 3-16, 3-18, 3-21, and 3-22. The spillway chute would be lowered by drilling and blasting methods. The existing spillway chute walls would remain, and the deepened chute would be offset from the existing walls by 10 feet. Rock dowels and permanent facing would be placed between the deepened chute and the existing training walls. The deepened chute would be lined with concrete and the existing channel would transition to the deepened chute at a 3H:1V slope. The existing bridge would remain in place and the portion of the drilled shafts underlying the spillway channel at the bridge location that are exposed by the deepening would be demolished to match the new grade elevation.
- > Extending the spillway chute approximately 50 feet beyond its current termination. The extension would be concrete lined and transition to the existing ground surface at grade.

The final option, which would likely include elements of both options, will be selected based on the results of additional more detailed studies including the following:

- > Topographic Surveys - detailed topography surveys of the site will be performed to develop basemaps for use in preparing the final design.
- > Geotechnical Investigations - geologic and geotechnical investigations will be performed to obtain information on: 1) the character of soils and bedrock at the locations of the proposed excavations for evaluation of cut slopes and temporary and permanent support needs; and, 2) the character of bedrock for founding of new structural elements of the spillway alternatives. The geotechnical investigation includes geologic mapping, borings, and laboratory testing.
- > Hydraulic Analyses - additional hydraulic analyses including three-dimensional modeling will be performed to refine the dimensions of chute modifications. Such modeling also supports the physical modeling that DSOD has indicated would be required for the final design.
- > Structural Investigations and Analyses – the Project options tie-in to portions of the existing spillway and include demolition of portions of the existing chute. A detailed condition assessment of the spillway will be performed to support the design efforts, including non-destructive testing, coring, and laboratory testing to evaluate the condition and strength of the existing concrete. Structural modeling and analyses of the existing spillway, and proposed tie-in of the new components, will be performed to fully evaluate the technical feasibility of the proposed alternatives and to develop preliminary design details.

During construction of either option, the reservoir level would be lowered below minimum pool to reduce the risk of spillway discharges and damage to the work in progress. The spillway modifications would be constructed after the new outlet works facilities are in operation on the left abutment of the dam. The new outlet works facilities and possibly the existing outlet works would be used to manage reservoir levels, and thereby reduce the risk of flooding of the spillway construction area. Based on the findings of the Santa Felicia Dam Safety Improvement Project; Hydrological Risk Analysis (UWCD 2018a), the flooding and spilling risks during the construction period are relatively low; however, prior to construction, a plan would be developed to adaptively manage water levels in Lake Piru Reservoir through controlled releases based on real-time data in order to further minimize the risk of flooding. Construction access would use existing access roads as well as temporary access roads that would be constructed as needed to allow

access for spillway and bridge construction activities. In addition, a barge may be used to transfer materials and equipment across Lake Piru Reservoir to/from the spillway construction area.

A Constructability Report (GEI 2017b) was prepared for the Project. The objective of the report is to provide a sufficient level of detail for anticipated construction methods, scale, timing, duration, construction equipment, and workforce to support the environmental analysis in this EIR. The following summarizes key findings of the report:

- > Construction activities would generally be performed in five, 8-hour work shifts (40 hours) per week on weekdays during daylight hours. However, certain tasks may require that work be conducted more than 8 hours per day (extending into night shift work) and weekends.
- > Large-sized truck trips would be scheduled during off peak hours as feasible.
- > Erosion protection during construction will follow required permit conditions and BMPs.
- > Clearing and grubbing of trees and shrubs would be performed along new access roads, within excavated areas, and at potential stockpile and spoil areas.
- > Excavation of soil materials would be performed using conventional excavation equipment.
- > Excavation of rock for spillway modifications would primarily be performed using drill-and-blast techniques, dozers with rippers, loaders, excavators, and dump trucks.
- > Excavated materials would be processed and used as structural fill or disposed of on site in a designated spoil area located on the existing downstream toe berm.
- > Fills for construction would be placed and compacted using conventional earthmoving and compaction equipment.
- > Water for dust control, moisture conditioning of soils for compaction, and other incidental construction uses would be obtained from Lake Piru Reservoir.
- > Conventional concrete for construction would be obtained from existing commercial concrete plants and the concrete would be transported to placement areas at the site using 8-cubic yard ready-mix concrete trucks.
- > Materials for construction (such as steel for reinforcing and beams) would be delivered to the site with semi-trailer trucks.
- > Demobilization would include removal of all contractor facilities, equipment and materials from the site once all field work is completed.
- > Reclamation of the site prior to final demobilization would follow required permit conditions and BMPs.

3.2.3 Spillway Construction Schedule

The spillway construction activities would proceed following completion of the new outlet works system and commencement of operations of that system. The activities are expected to be completed in approximately 24 months with the construction phases broken out as shown in Tables 3-4 (Spillway Widening) and 3-5 (Spillway Deepening) and shown in Figures 3-24 and 3-25.

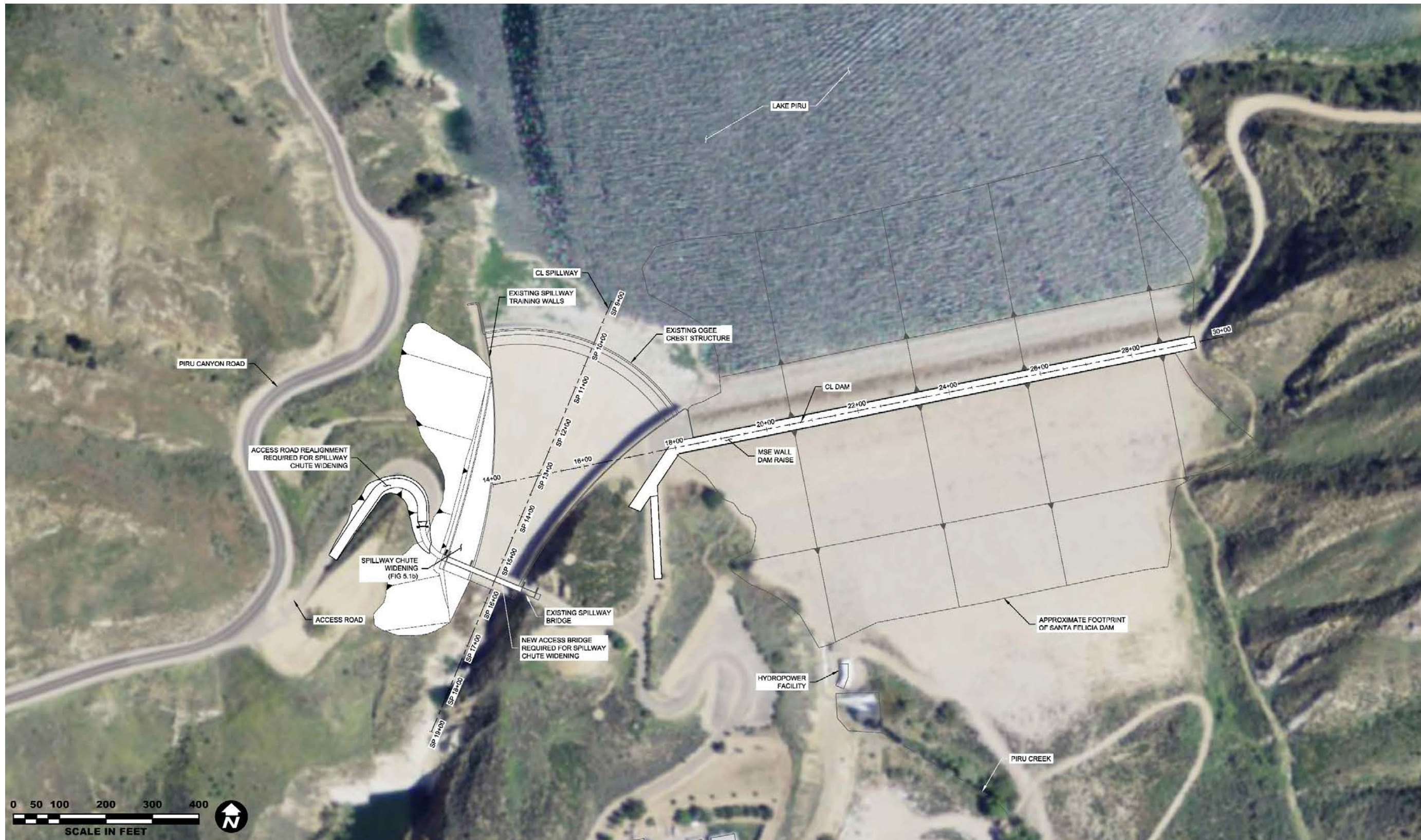
Table 3-4 Spillway Widening Construction Phases and Timing

Construction Phase	Timing
Mobilization	Month 1
Access Road Realignment	Months 1-4
Selective Site Demolition	Months 4-8
Excavation for Chute Widening	Months 5-11
Training Walls and Chute Lining	Months 11-19
MSE Wall Dam Raise	Months 11-15
Bridge Pier and Abutment	Months 15-19
Access Bridge	Months 19-23
Demobilization and Reclamation	Month 24

Table 3-5 Spillway Deepening Construction Phases and Timing

Construction Phase	Timing
Mobilization	Month 1
Selective Site Demolition	Months 2-5
Excavation for Chute Deepening	Months 5-11
Rock Stabilization/Permanent Facing	Months 5-15
Chute Lining	Months 15-23
MSE Wall Dam Raise	Months 11-15
Demobilization and Reclamation	Month 24

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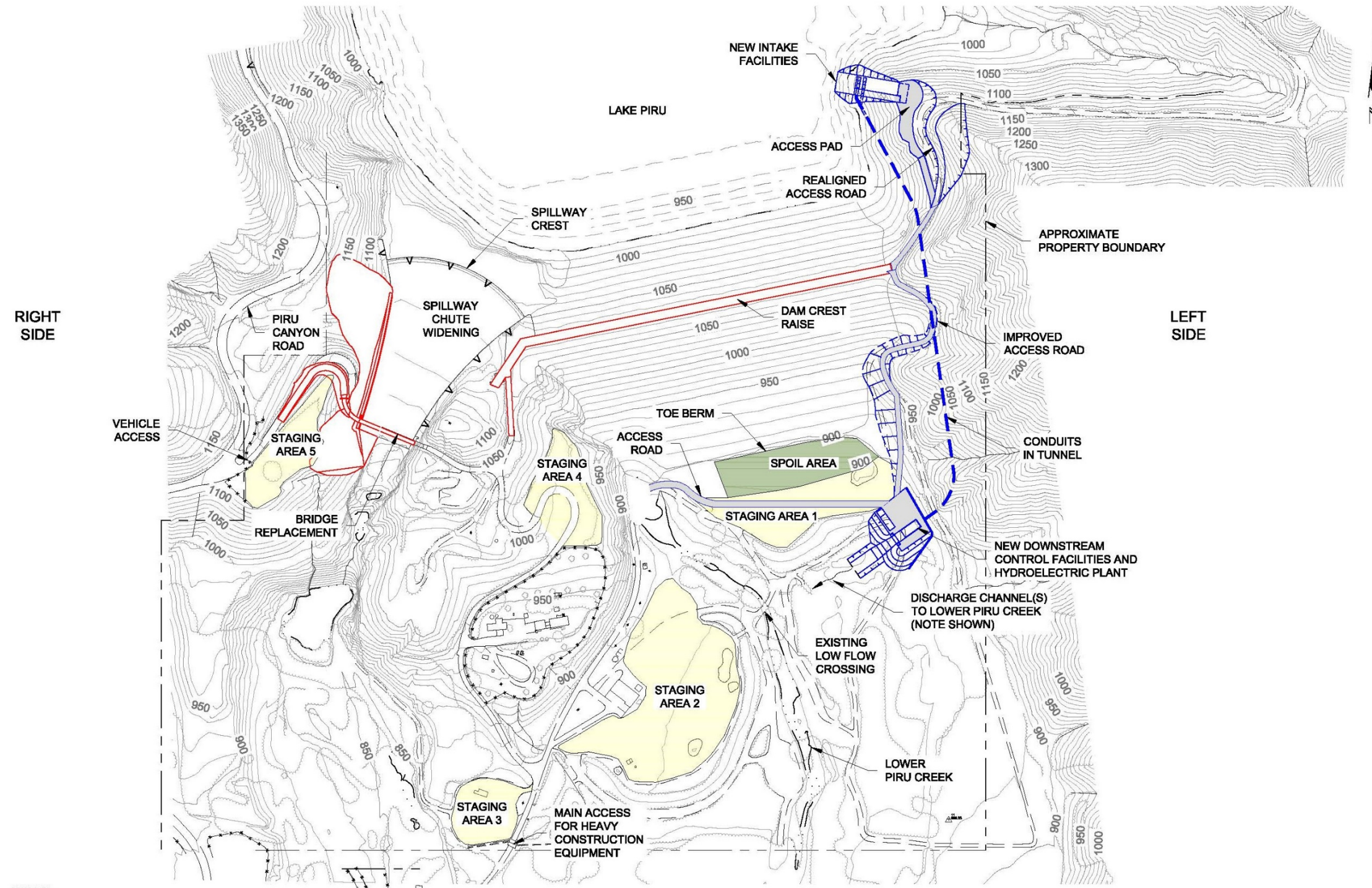
Source: GEI 2017b

Figure 3-15 Spillway Channel Widening Option

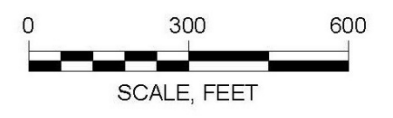


Source: GEI 2017b

Figure 3-16 Spillway Channel Deepening Option

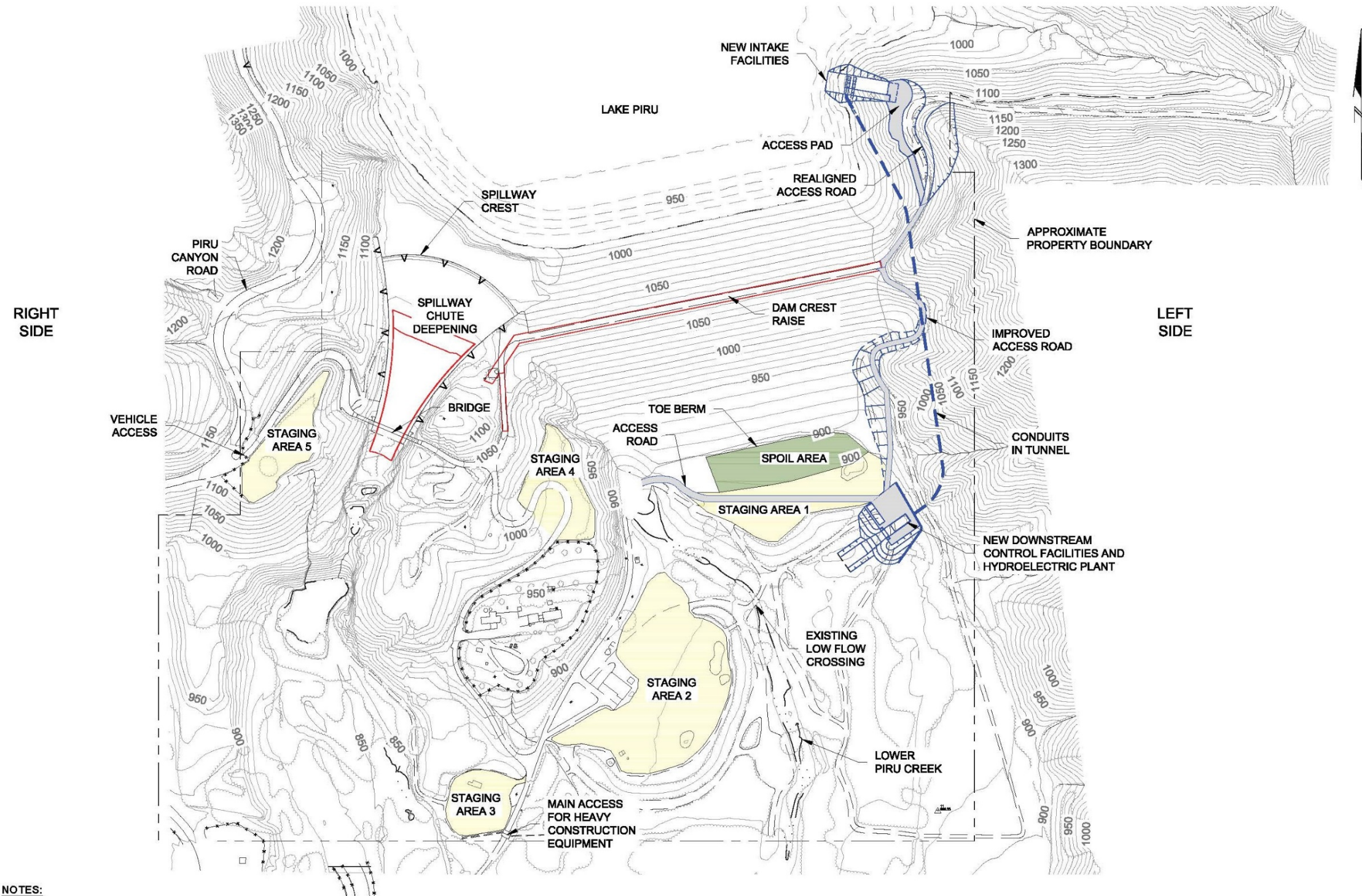


- NOTES:**
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 2. TOPOGRAPHY BASED ON 2015 SURVEY BY FUGRO.
 3. FUTURE OUTLET WORKS FACILITY DEPICTED ON LEFT ABUTMENT (APPROXIMATE ONLY).

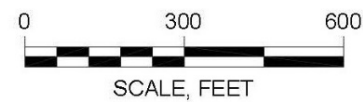


Source: GEI 2017b

Figure 3-17 Spillway Widening Option Layout and Construction Footprint

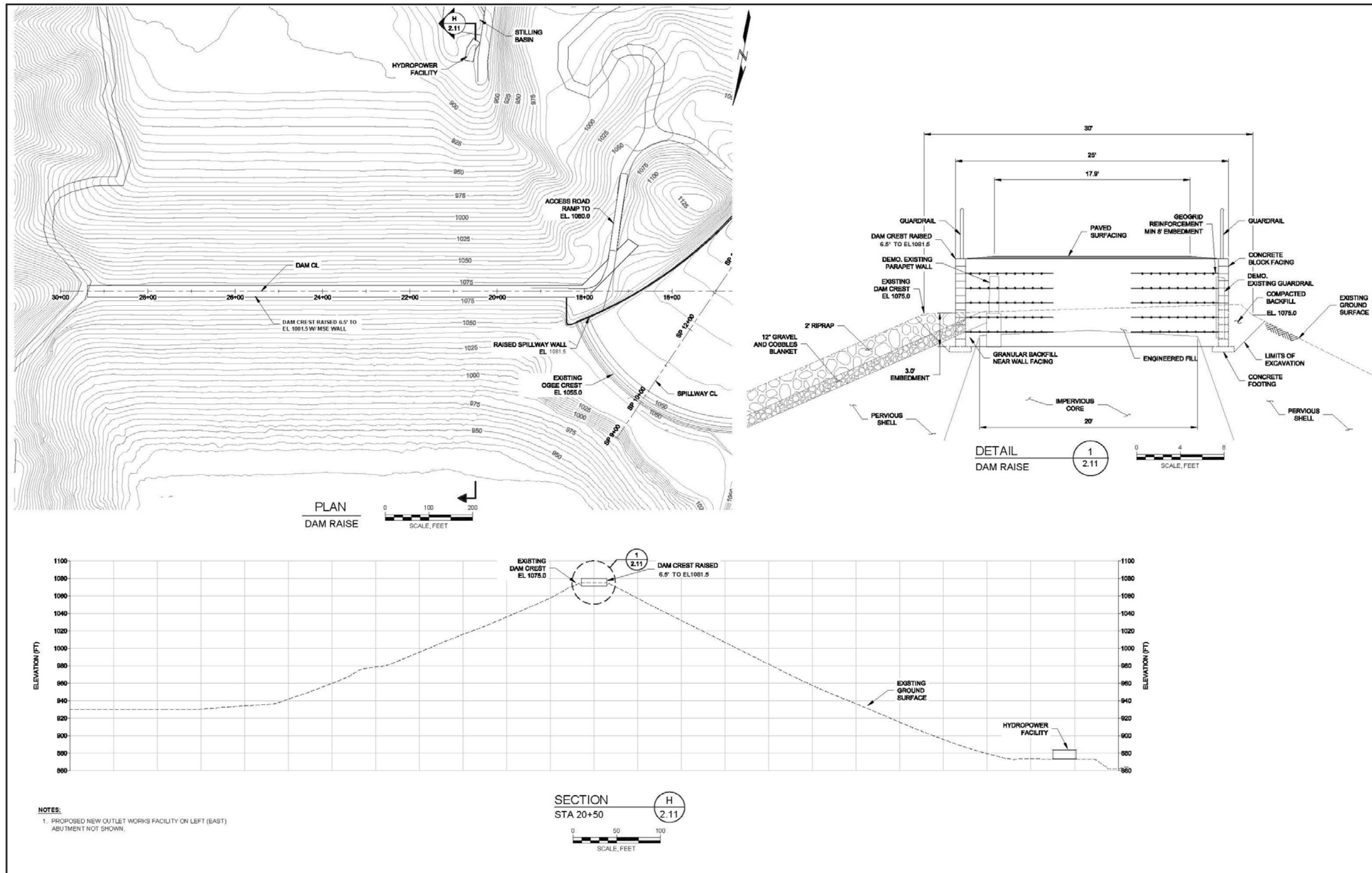


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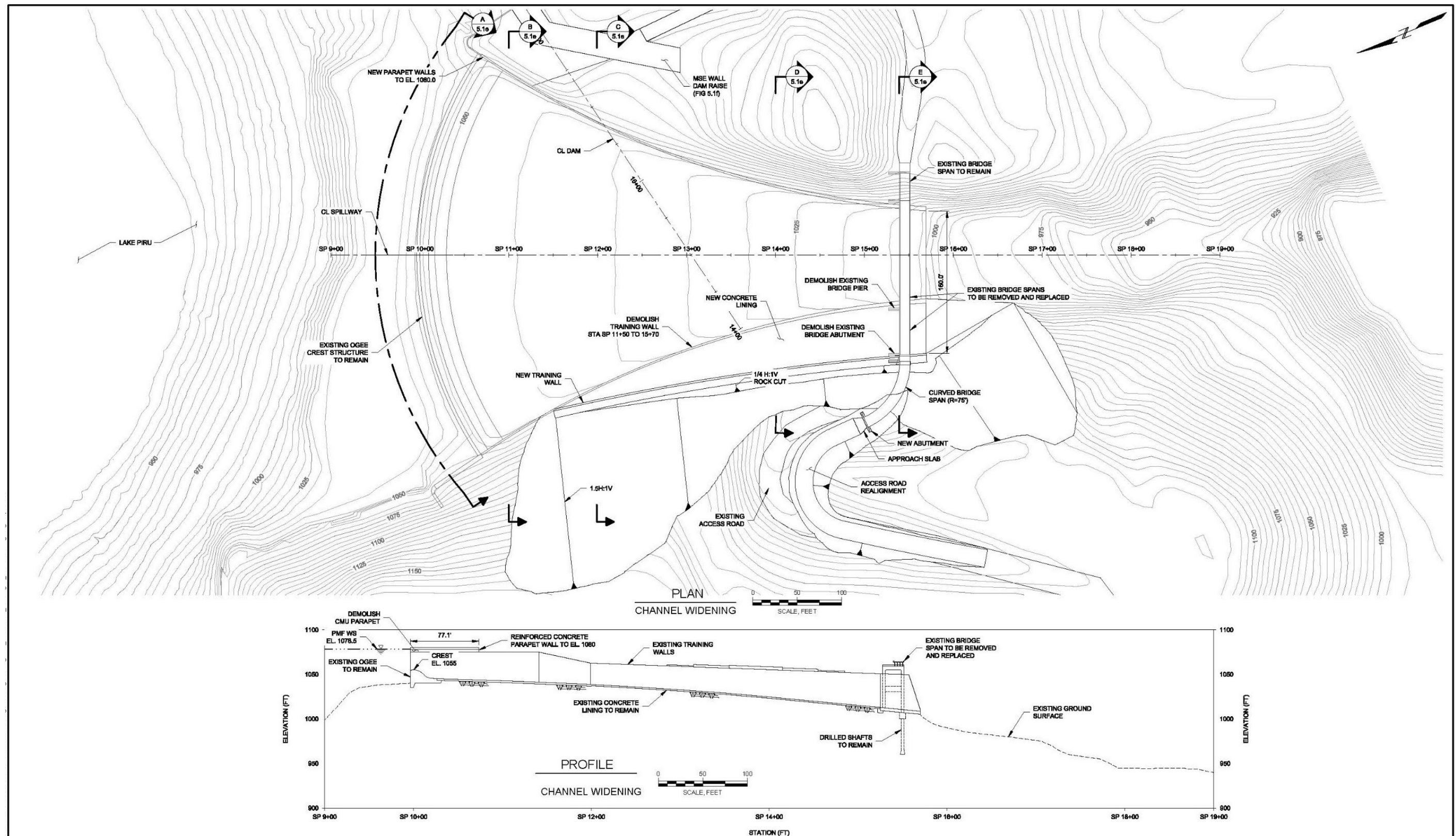
Source: GEI 2017b

Figure 3-18 Spillway Deepening Option Layout and Construction Footprint



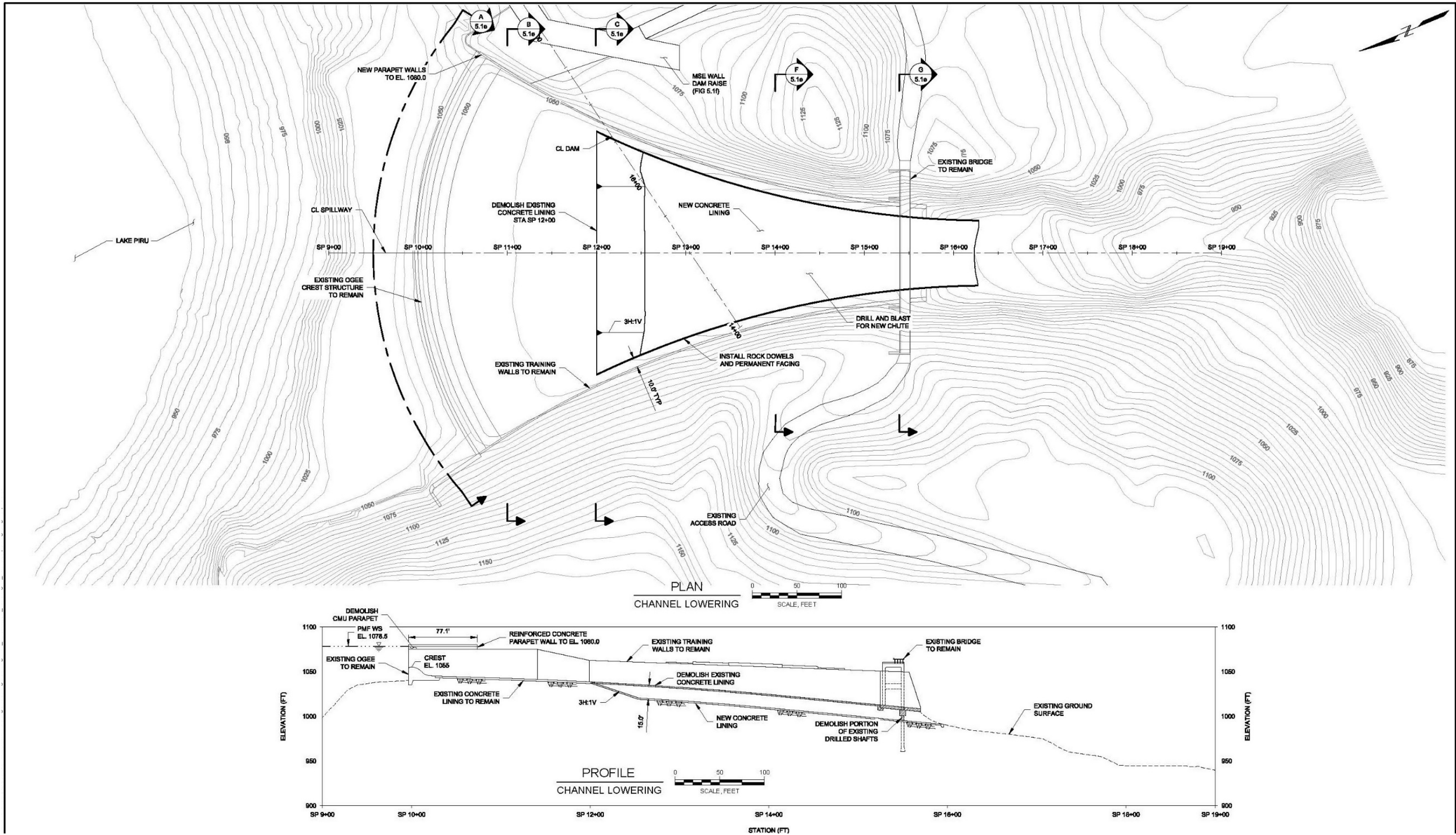
Source: GEI 2017b

Figure 3-19 Plan, Profile, and Section Views of Dam Crest Raise



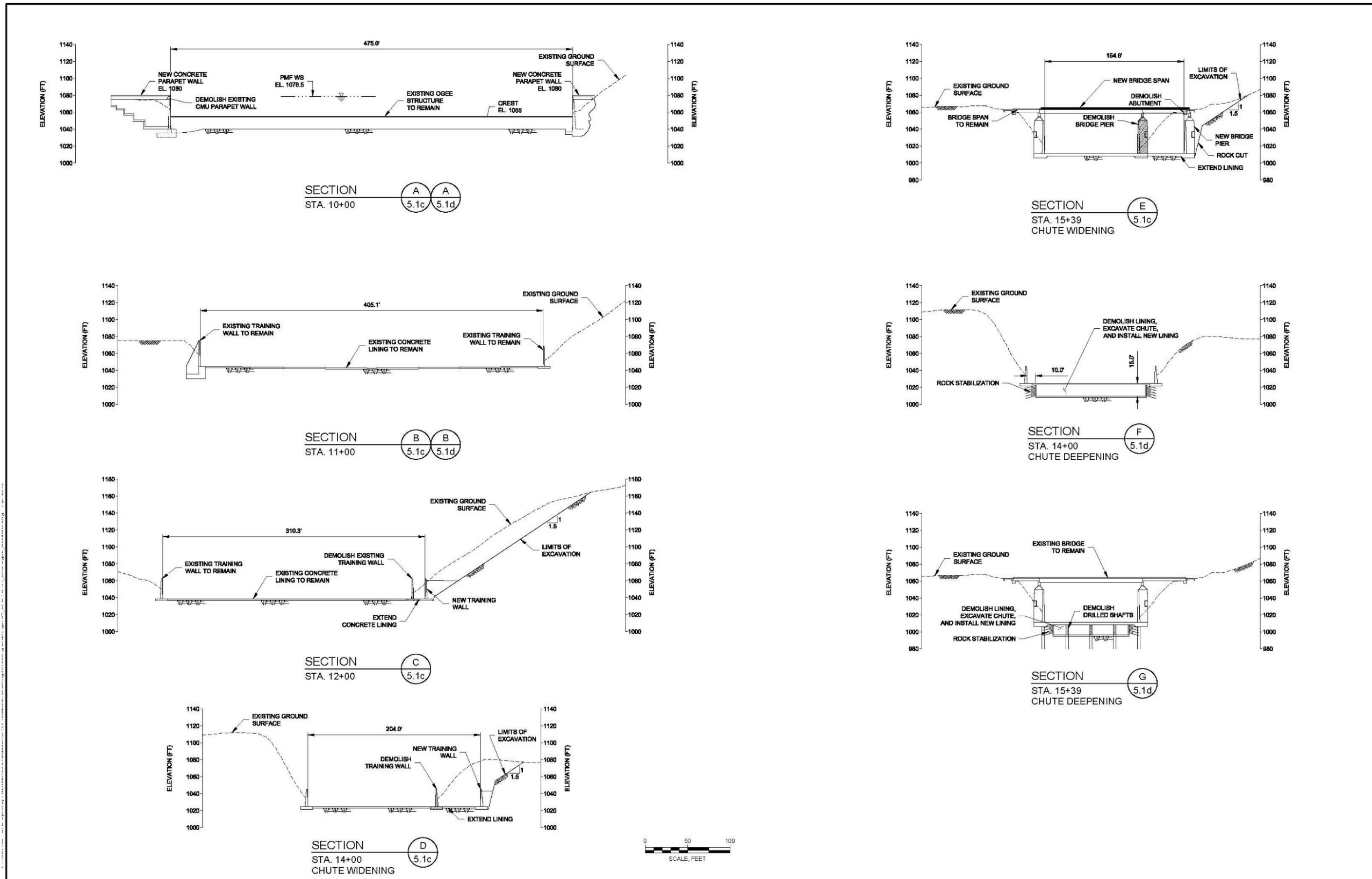
Source: GEI 2017b

Figure 3-20 Plan and Profile View of the Spillway Channel Widening Option



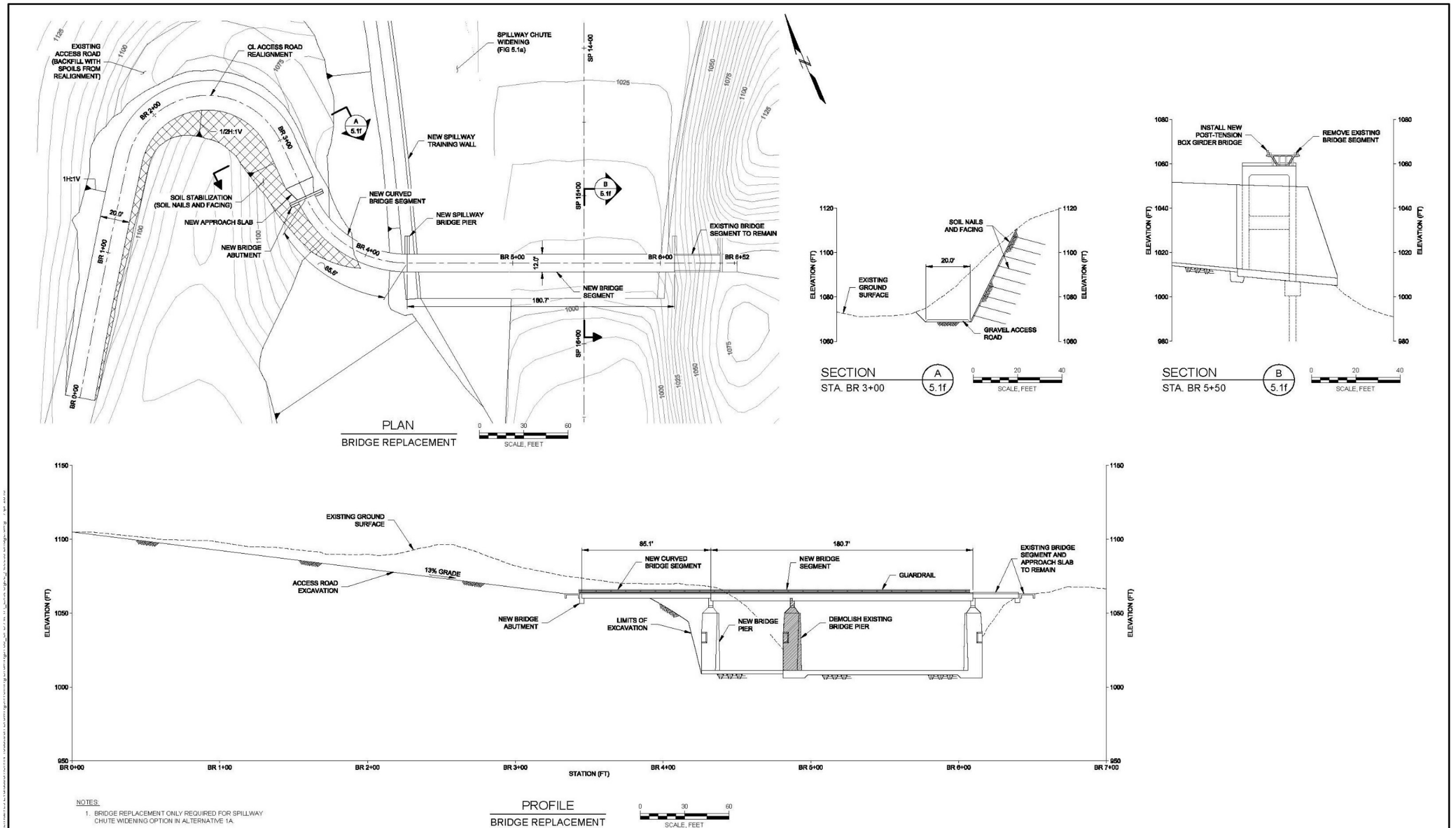
Source: GEI 2017b

Figure 3-21 Plan and Profile Views of Spillway Channel Deepening Option



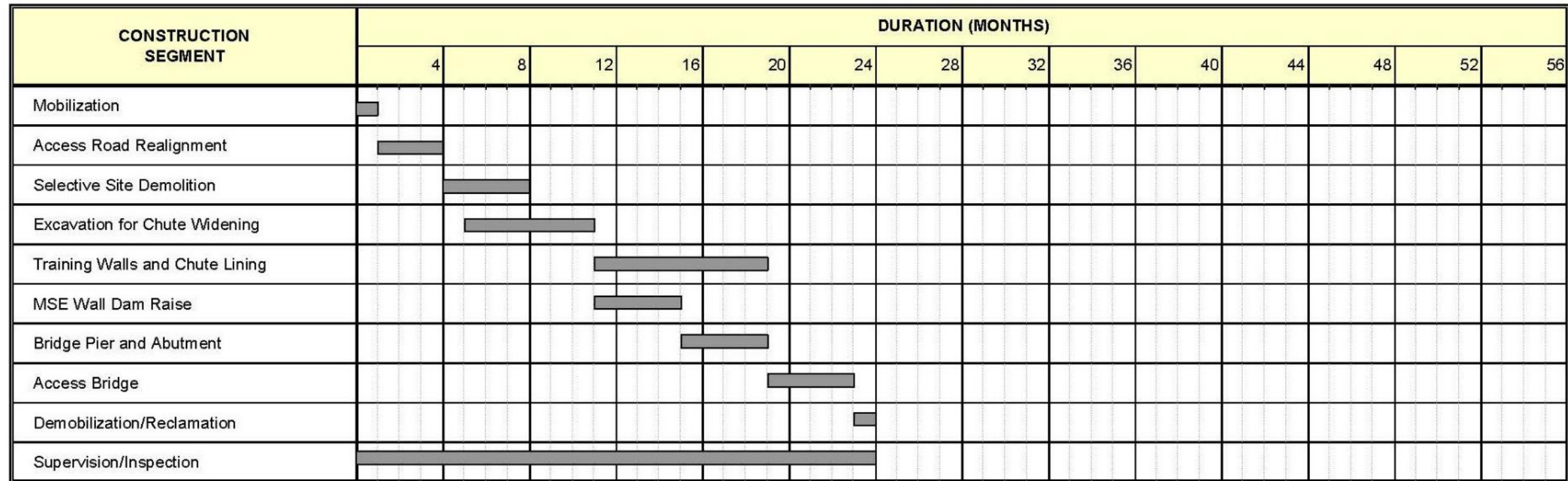
Source: GEI 2017b

Figure 3-22 Section Views of Spillway Channel Widening and Deepening Options



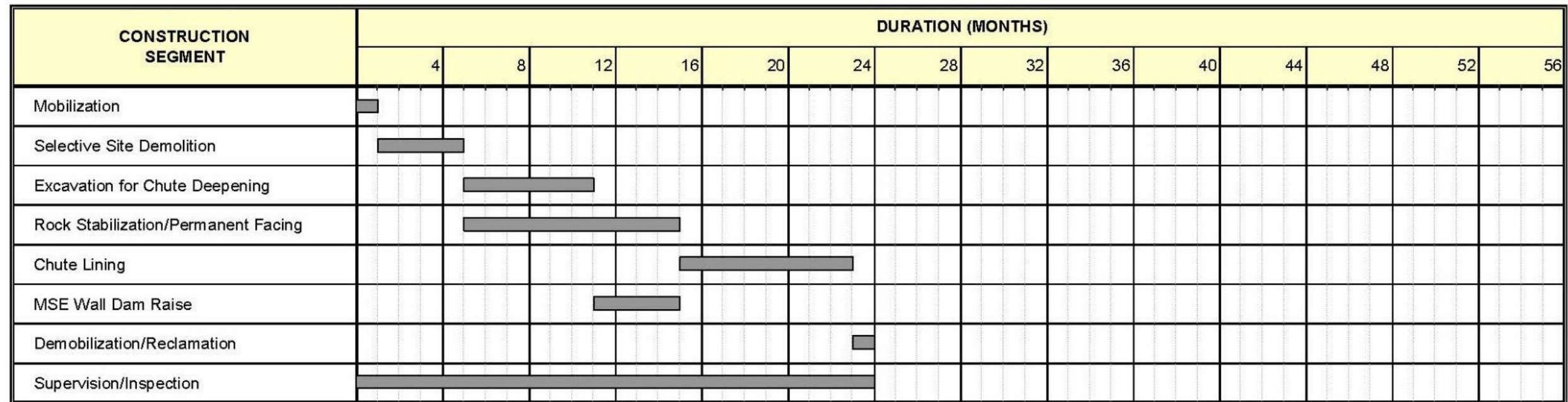
Source: GEI 2017b

Figure 3-23 Plan and Profile Views of Bridge Replacement Associated with Spillway Channel Widening Option



Source: GEI 2017b

Figure 3-24 Estimated Construction Schedule for Spillway Widening Option



Source: GEI 2017b

Figure 3-25 Estimated Construction Schedule for Spillway Deepening Option

4 ALTERNATIVES

One of the most important aspects of the environmental review process is the identification and assessment of reasonable alternatives that have the potential for avoiding or minimizing the impacts of a proposed Project. In addition to mandating consideration of the No Project Alternative, the CEQA Guidelines (Section 15126.6(d)) emphasize the selection of a reasonable range of feasible alternatives and adequate assessment of these alternatives to allow for a comparative analysis for consideration by decision-makers.

CEQA requires consideration of a range of alternatives to the Project or Project location that: (1) could feasibly attain most of the basic Project objectives; and (2) would avoid or substantially lessen any of the significant impacts of the proposed Project. An alternative cannot be eliminated simply because it is costlier, or if it could impede the attainment of all Project objectives to some degree. However, the CEQA Guidelines declare that an EIR need not consider an alternative whose effects cannot be reasonably ascertained and whose implementation is remote or speculative. CEQA requires that an EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed Project.

The Santa Felicia Dam Safety Improvement Project is under continuing review by DSOD and FERC to ensure that dam safety issues related to the selected design have been identified and addressed. As such, there could be modifications to the Project after certification of the EIR, based upon the continuing DSOD and FERC review. Therefore, the consideration of alternatives is also intended to bound the potential environmental effects of foreseeable changes leading to the final design and allow the lead agency to approve a modified Project, if necessary. To gain this flexibility, alternatives are analyzed at an equivalent level of detail as the Project. The following sections discuss the alternatives screening methodology, the screening results, and the alternatives that have been eliminated from consideration.

4.1 Alternatives Screening Methodology

A screening-level analysis was conducted to identify a reasonable range of alternatives to analyze at an equivalent level of detail to the proposed Project in the EIR. The screening-level analysis was conducted at a lesser level of detail than for the Project (consistent with CEQA requirements), and consisted of three steps:

Step 1: Defining the alternatives to allow comparative evaluation.

Step 2: Evaluating each alternative in consideration of the following criteria:

- > the extent to which the alternative would accomplish most of the basic goals and objectives of the Project;
- > the extent to which the alternative would avoid or lessen one or more of the identified significant environmental effects of the Project;
- > the potential feasibility of the alternative, in consideration of site suitability, economic viability, availability of infrastructure, and consistency with other applicable plans and regulatory limitations;
- > the appropriateness of the alternative in contributing to a “reasonable range” of alternatives necessary to permit a reasoned choice; and,
- > the requirement of the CEQA Guidelines to consider a “No Project” alternative and to identify an “environmentally superior” alternative (CEQA Guidelines, Section 15126.6(e)).

The Santa Felicia Dam Safety Improvement Project consists of specific changes required for dam safety with little opportunity for crafting alternatives that would reduce or eliminate impacts; therefore, the approach to identifying alternatives was to rely upon the extensive feasibility study work already conducted and then screen those alternatives to arrive at a final set that provide a reasonable range of feasible alternatives that meet project objectives.

Step 3: Determining the suitability of the proposed alternative for full analysis in the EIR. If the alternative was unsuitable, then it was eliminated from further consideration, with appropriate justification.

In the final phase of the screening analysis, UWCD carefully weighed the environmental advantages and disadvantages of the remaining alternatives with respect to the potential for overall environmental advantage, technical feasibility, and consistency with Project objectives.

At the screening stage, it is not possible to evaluate potential impacts of the alternatives or the proposed Project with absolute certainty. However, it is possible to identify elements of the proposed Project that are likely to be the sources of impact and use these to screen alternatives. A preliminary assessment of the potential significant effects of the proposed Project resulted in identification of potential construction-related impacts to biological resources, cultural resources, traffic, noise, air quality, soils, water resources, and recreation. These potential impacts were used to support the screening-level analysis.

4.2 Summary of Screening Results

Potential alternatives were reviewed using the screening criteria presented above. The screening analysis primarily relied on technical analyses provided in the following two studies:

- > Santa Felicia Dam Outlet Works Rehabilitation Project – Phase 1 (GEI 2015a)
- > Santa Felicia Dam Spillway Alternative Study (GEI 2015b)

These two reports are incorporated by reference into this EIR. The reports considered various constraints affecting the alternative designs and analyzed several different potential alternatives. The alternatives that were eliminated from consideration as part of the screening process discussed in these two GEI reports are summarized below.

4.2.1 Outlet Works

The screening evaluation for the outlet works considered various alternatives for the intake facility, tunnel construction method and alignment, and flow control configuration. The alternatives considered for the intake facility included the following:

- > freestanding structure versus tied-to bedrock slope; and
- > the location of the structure considering the need to found it on competent bearing materials, accommodate a fish screen system, and remain stable and functional following design earthquake loading.

Given these considerations, a free-standing structure was deemed impractical as it would require underwater construction which is costly and significant excavation of sediment/alluvium to anchor into underlying bedrock. In regard to location, the bedrock slopes on either the right or left abutments were identified as being structurally acceptable for the intake facility and the evaluation of these options is discussed further in Section 4.3.

The tunneling analysis evaluated drill-and-blast and microtunneling options as well alignments along the right and left abutments. Microtunneling was ruled out due to its relatively high cost and higher risk given the complexities associated with this method. The geology and groundwater conditions along tunnel

alignments on the right and left abutments were deemed similar and the evaluation of these options is discussed further in Section 4.3.

The primary considerations regarding flow control included the location of the guard valves – either at the upstream, downstream, or an intermediate location within the conduit tunnel – and ability to dewater for maintenance purposes. Alternatives that included guard valves at intermediate locations within the tunnel and/or did not allow for dewatering of the conduit for inspection were screened out and not considered further.

4.2.2 Spillway Modification Alternatives

The screening criteria for the spillway modification alternatives included cost, implementation considerations, and the ability to accommodate the design objectives. Table 4-1 outlines the alternatives that were not included for further analysis.

Table 4-1 Spillway Alternatives Considered but not Further Evaluated

Description	Initial Estimate Cost Range	Implementation Considerations	Ability to Accommodate the Larger IDF	Retained for Further Evaluation?
Modify Existing Spillway: Construct new extended ogee crest with crest length of 660 feet; raise one existing chute wall; replace opposite chute wall; add bridge spans or rebuild bridge.	\$30M to \$40M	Potential exposure of work area during flood events; new crest would extend well into reservoir requiring added concrete construction; potential bridge rebuild; interference with planned right abutment outlet works intake; excavation in reservoir sediments.	Accommodating a larger IDF than 220,000 cfs would require raising the dam crest and more extensive chute modifications than the proposed Project or constructing an auxiliary spillway.	No. This alternative would be challenging to construct and would likely interfere with the outlet works improvements should they be located on the right abutment.
Provide Auxiliary Spillway Capacity: Retain existing spillway and bridge; provide auxiliary spillway with crest length of 450 feet over the existing dam using conventional or roller-compacted concrete to protect the dam.	\$40M to \$50M	No modifications required at existing spillway crest and chute; second spillway required; regulatory approval would likely be denied based on feedback from DSOD and FERC.	This alternative could be combined with a dam crest raise to provide capacity for a larger IDF.	No. This alternative would not likely be approved by DSOD and FERC.

4.3 Determination of Alternatives for Full Evaluation

4.3.1 Alternative 1 – Proposed Project

4.3.1.1 *Outlet Works System Options*

The primary consideration for the outlet works system alternative was whether to construct the new system along the west (right) abutment or along the east (left) abutment of Santa Felicia Dam. The advantages and disadvantages of these options are summarized in Table 4-2 below.

Table 4-2 Comparison of Outlet Works Systems Located on Right vs. Left Abutment

	Right Abutment Options	Left Abutment Options
Key Advantages	<ul style="list-style-type: none"> > Allows for reuse of existing hydroelectric facility. > Allows established access and power supply infrastructure to be reused. > Provides opportunity to reuse portions of the existing downstream control facilities. > Reuses established stilling basin and outlet channel. > Remnant road fill next to intake location could potentially be used as a work pad, and to build a cofferdam to provide additional protection against rising reservoir level. 	<ul style="list-style-type: none"> > No interference with existing spillway. > All downstream facilities will be new; opportunity to construct a more efficient hydroelectric facility. > Existing outlet works can remain fully operational for the entire construction period to provide habitat releases and reservoir control, as well as allow more flexibility in construction sequencing. > Construction is remote from existing outlet works, thus eliminating potential for damage to them. > Open space in downstream area allows for more efficient tunnel and downstream facility construction.
Key Disadvantages	<ul style="list-style-type: none"> > Potential for interference from future modifications to spillway. > Flows toward spillway may deposit debris on outlet works, although this could be mitigated by proposed debris boom. > Tunnel entry portal is adjacent to existing downstream control facility, creating constrained work site and potential interference issues. > Portable pump likely required to supplement habitat water releases during construction. > Construction sequencing is not as flexible. Existing downstream facilities must remain operational until new intake facilities have been constructed so that the reservoir level can be controlled. Thus, construction schedule may be longer. 	<ul style="list-style-type: none"> > No opportunity to reuse portions of existing downstream control facilities. > New infrastructure required for access roads, power supply, and outlet channel extension.

After reviewing the various factors, the west (right) abutment option was not retained for further consideration primarily due to potential constraints on modifications to the existing spillway and the challenges associated with maintaining flow releases during construction of the new outlet works system. In addition, the Project provides the opportunity to construct a new, more efficient hydroelectric facility. As discussed in Section 3, several factors associated with the Project design for the new outlet work system on the left abutment are still under development, including the specifications for the intake structure and the hydroelectric facility.

4.3.1.2 Spillway Alternatives

In May 2014, UWCD met with DSOD and FERC to discuss a range of alternatives to increase the spillway conveyance. Based on input from DSOD and FERC, several alternatives involving overtopping protection of the dam were dismissed from further consideration, and the alternatives presented in Table 4-3 were developed for further evaluation.

Table 4-3 Spillway Improvement Alternatives

Alternative	Option	Description
Alternative 1 (Project) Modify Spillway Chute and Raise Dam	1A – Widen Spillway Chute	Raise the dam crest by five feet to 1,080 feet msl; demolish the right chute wall and widen the chute to approximately 160 feet at the downstream end keeping the same vertical alignment of the chute; modify access road and provide new bridge
	1B – Deepen Spillway Chute	Raise the dam crest by five feet to 1,080 feet msl; demolish the existing chute invert from approximately Station 12+00 downstream; extend the chute beyond its current termination by approximately 50 feet
Alternative 2 Replace Existing Spillway Crest and Modify Chute with Labyrinth Crest (referred to as the “Labyrinth Alternative”)	2A – Widen Spillway Chute	Demolish existing ogee crest and upper chute walls; construct new labyrinth crest; demolish the right chute wall and widen the chute to approximately 160 feet at the downstream end keeping the same vertical alignment of the chute; modify access road and provide new bridge
	2B – Deepen Spillway Chute	Demolish existing ogee crest and upper chute walls; construct new labyrinth crest; demolish the existing chute invert from approximately Station 12+00 downstream; extend the chute beyond its current termination by approximately 50 feet
Alternative 3 Provide an Auxiliary Spillway	3A – Tunnel on Right Abutment	Auxiliary side-channel spillway crest structure and 40-foot-diameter discharge tunnel on the right abutment leading to the existing spillway discharge channel
	3B – Channel on Left Abutment	Auxiliary side-channel spillway crest structure and 40-foot-diameter discharge tunnel on the left abutment leading to a terminal structure and discharge channel to Piru Creek

Of these alternatives, Alternatives 1A and 1B were retained for additional consideration in this EIR and are described in Section 3 as the two Project options. Alternatives 3A and 3B involve retaining the existing spillway and dam crest elevation and providing auxiliary spillway capacity at another location. Given the site constraints, options for locating an auxiliary spillway with the required capacity are limited and not adequate to meet the Project Objectives. The alternatives were therefore not retained for detailed analysis. Alternatives 2A and 2B were retained for analysis as Project alternatives, as described below.

4.3.2 Alternative 2 Labyrinth Alternative

Under this alternative, the existing spillway crest would be replaced with a labyrinth crest structure¹ and the existing spillway chute would be widened and/or deepened to provide the required flood discharge capacity for the IDF. This alternative would involve demolition of the existing service spillway crest structure, portions of the existing chute and spillway walls, and construction of a widened and/or

¹ A labyrinth crest structure is a structure that lengthens the flow path by using a zig-zag design to convey large flows at low heads by increasing the effective length of the crest with respect to the channel breadth.

deepened spillway with a 6-cycle labyrinth crest structure as shown in Figures 4-1 through 4-6. Preliminary labyrinth spillway dimensions were established based on published literature (GEI 2015b). The overall labyrinth width would be approximately 330 feet with a crest elevation at 1,055 feet msl. This configuration would route the IDF with the reservoir reaching a maximum level at approximately 1,073.5 feet msl. The dam crest would remain at 1,075 feet msl (1,078 feet msl at the top of the existing parapet wall).

The labyrinth weir walls would be 16 feet high and the total length of wall for each labyrinth cycle would be approximately 368 feet. The width of the labyrinth crest normal to the flow direction would be 185 feet. The labyrinth structure itself has an estimated concrete volume of 11,000 cubic yards, excluding requirements for the chute modifications to provide the required discharge capacity. Construction requirements for the chute widening option (Alternative 2A) and the chute deepening option (Alternative 2B) would be similar to the requirements provided for the Project in Section 3 with the exception that the dam crest would not need to be raised and it would involve significantly more demolition and concrete placement.



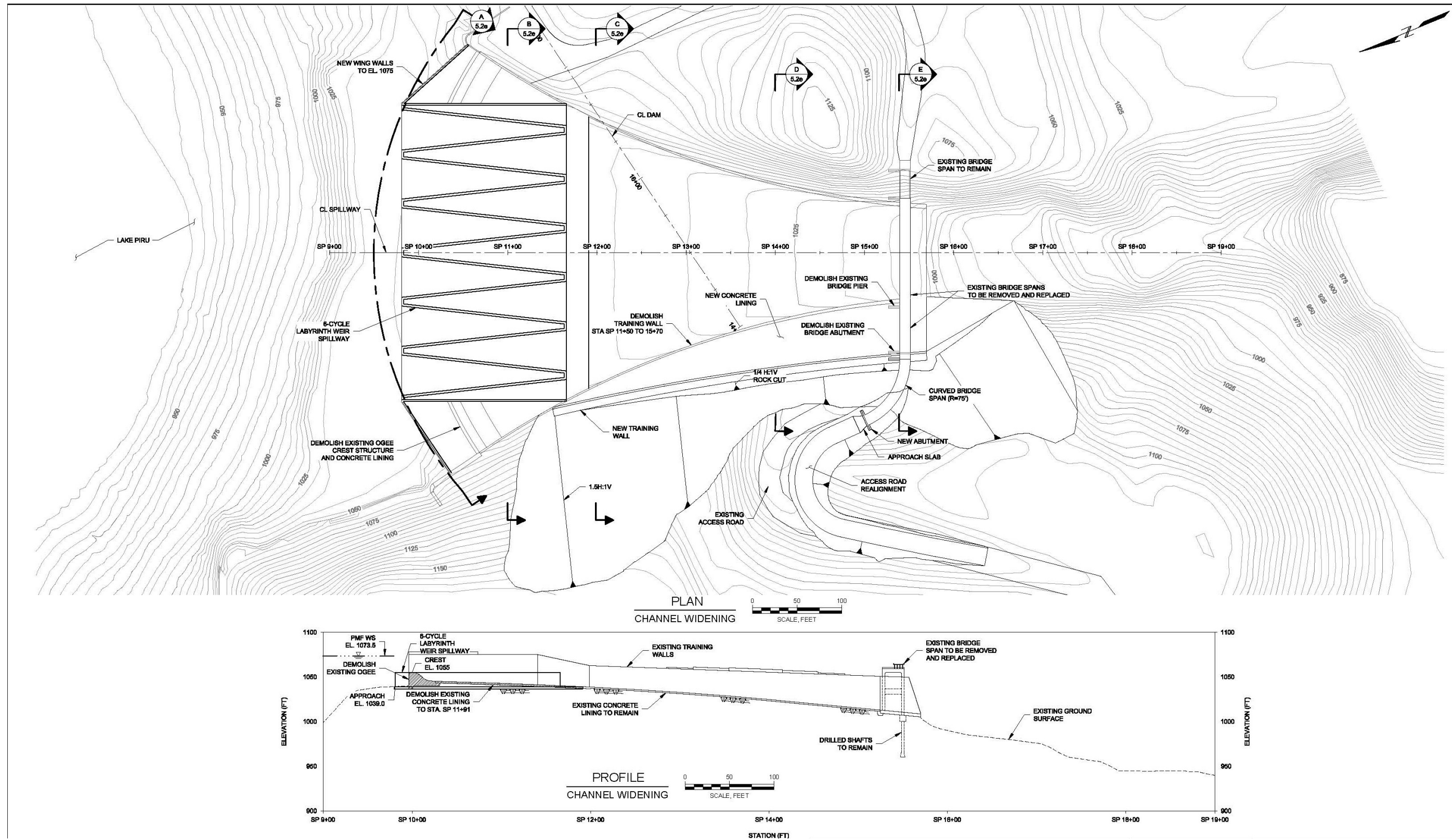
Source: GEI 2017c

Figure 4-1 Labyrinth Weir Spillway and Spillway Widening Option



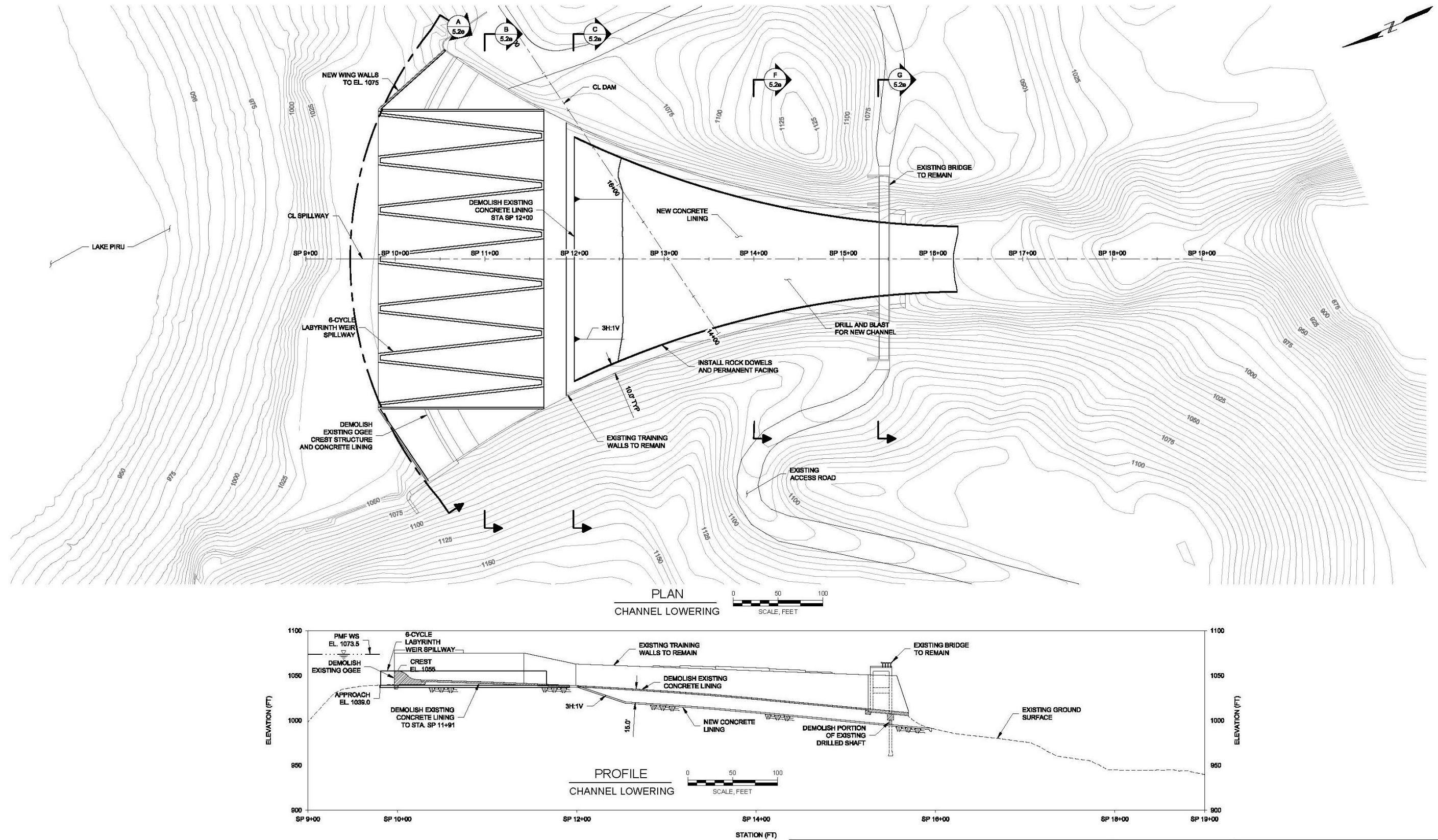
Source: GEI 2017c

Figure 4-2 Labyrinth Weir Spillway and Spillway Deepening Option



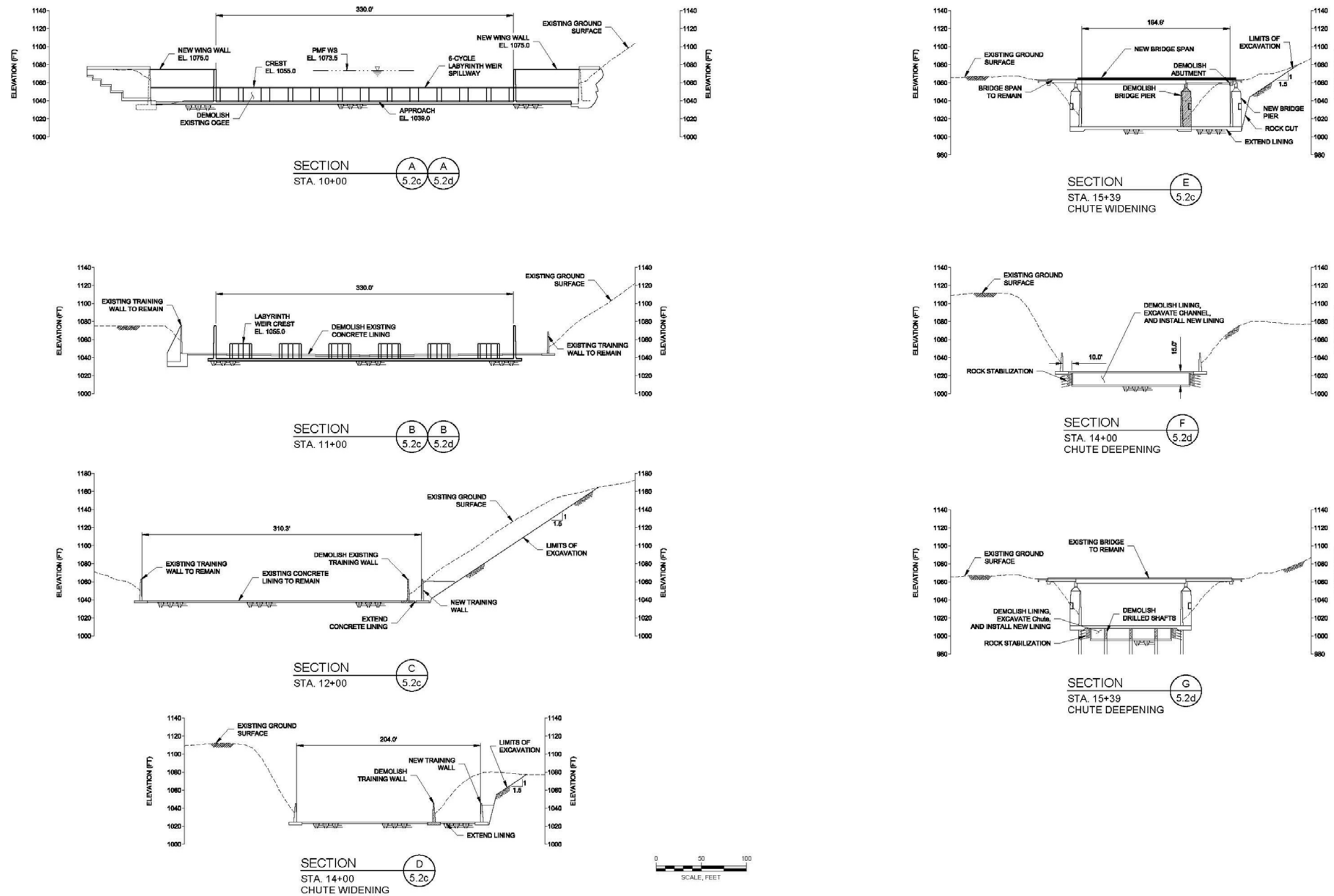
Source: GEI 2017c

Figure 4-3 Labyrinth Weir Spillway and Spillway Widening Option Plan and Profile



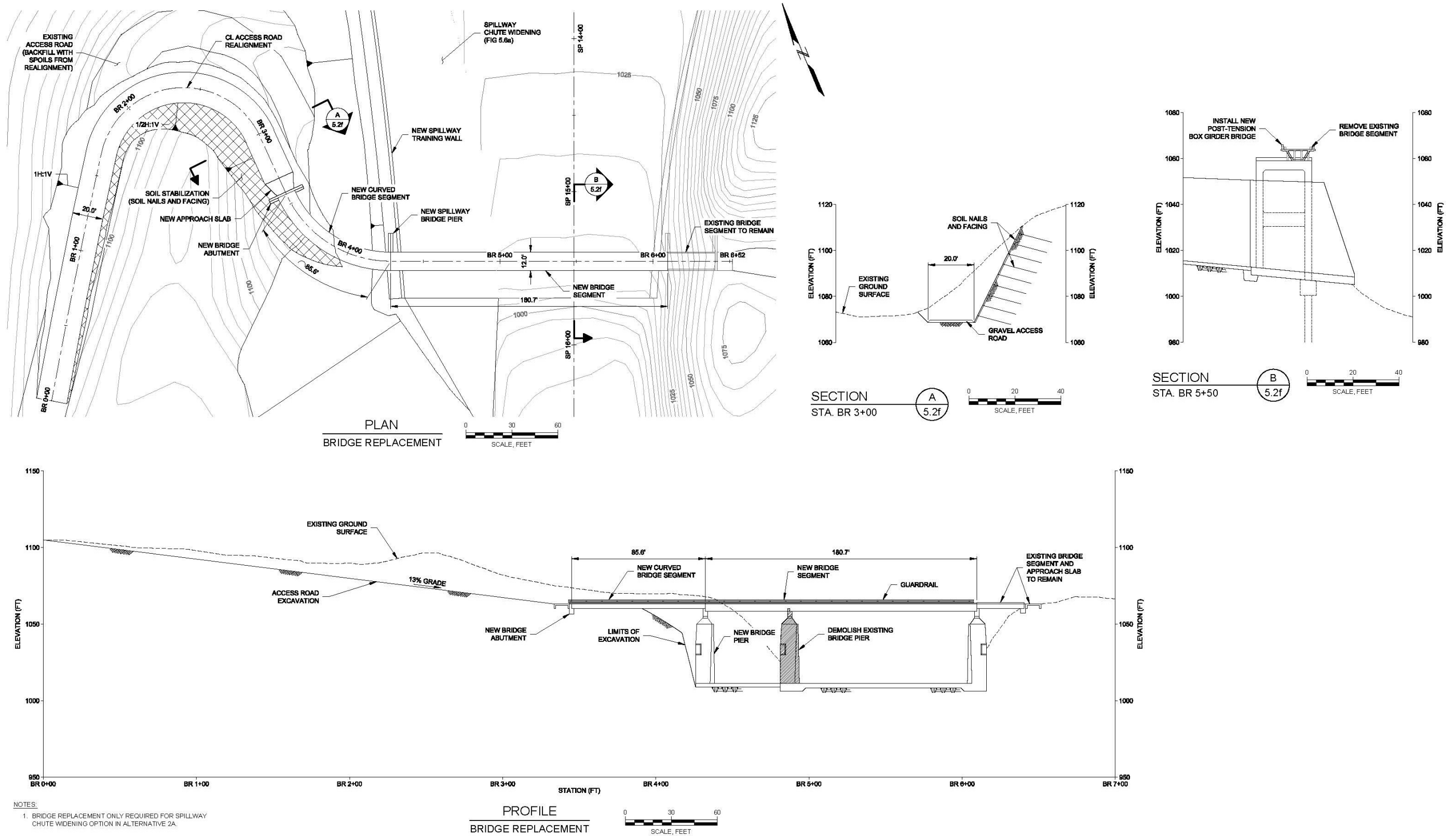
Source: GEI 2017c

Figure 4-4 Labyrinth Weir Spillway and Spillway Deepening Option Plan and Profile (GEI 2017)



Source: GEI 2017c

Figure 4-5 Labyrinth Weir Spillway and Spillway Widening and Deepening Section Views (GEI 2017)



Source: GEI 2017c

Figure 4-6 Labyrinth Weir Spillway and Spillway Widening Option Bridge Replacement

4.3.3 No Project Alternative

In addition to the proposed Project (Alternative 1) and Alternative 2 (Replace Existing Spillway Crest and Modify Chute with Labyrinth Crest), UWCD considers the No Project Alternative in this EIR. UWCD has three courses of action: (1) approve the Project with or without conditions; (2) deny the Project; or (3) postpone the Project pending further study by denying the Project without prejudice. The No Project Alternative would be the effects of denial or postponement of the Project.

If the Project is postponed or denied, none of the potential environmental impacts identified in this EIR for the proposed Project would occur. However, the objectives of the Project as described in Section 1.3, Project Purpose and Need and Project Objectives, would not be met. Specifically, this means that the safety of Santa Felicia Dam would not be improved. The spillway may not be able to safely convey the outflow from the regulatory IDF, and the outlet works may not be able to withstand loading from the MCE. In addition, intake improvements needed to mitigate the accumulation of sediment in the reservoir would not be made, making the existing intake tower inoperative sometime between 2023 and 2025. If sediment accumulates to the crest of and/or above the inlet of the intake tower, then UWCD may lose the ability to control water releases from the dam and manage releases from the outlet works.

4.4 Environmentally Superior Alternative

The State CEQA Guidelines [Section 15126.6(d)] require that an EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed Project. The Guidelines (Section 15126.6 [e][2]) further state, in part, that *“If the environmentally superior alternative is the “No Project” alternative, the EIR would also identify an environmentally superior alternative among the other alternatives”*. Based on the analysis provided in this EIR, UWCD has determined that the proposed Project is the environmentally superior alternative.

Table ES-1 provides a comparison of the environmental impacts of each alternative evaluated in this document, including the No Project Alternative.

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5 ENVIRONMENTAL ANALYSIS

This section examines the potential environmental impacts of the Project and Project alternatives. For each environmental resource category, the section provides background information and describes the environmental setting (baseline conditions) to help the reader understand the conditions that would cause an impact to occur. The regulatory framework relevant to each environmental resource category is then described, expanding on the summary of required regulatory agency approvals described in Section 1.5. Next, environmental impacts of the proposed Project and alternatives are evaluated in conformance with CEQA (Public Resources Code (PRC) Section 21000 et seq.) and the State CEQA Guidelines (Title 14, California Code of Regulations, Section 15000 et seq.) including the CEQA Checklist included as Appendix G to the Guidelines. Finally, the individual sections recommend mitigation measures to reduce potentially significant impacts to a level of less than significant, where necessary.

5.1 Environmental Impact Assessment Methodology

5.1.1 Environmental Baseline

The analysis of each environmental resource category begins with an examination of the existing physical setting (baseline conditions as determined pursuant to Section 15125(a) of the State CEQA Guidelines) that may be affected by the Project. The effects of the Project are defined as changes to the environmental setting that are attributable to construction and operation of the Project or an alternative.

5.1.2 Significance Criteria

Significance criteria are identified for each environmental resource category. The significance criteria serve as benchmarks for determining if components of the Project or an alternative would result in a significant adverse environmental impact when evaluated against the environmental baseline conditions. According to State CEQA Guidelines Section 15382, a significant effect on the environment means "...a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the Project..."

5.1.3 Impact Analysis

This EIR considers five categories of environmental impacts, as follows:

No Impact (O). The Project would not have any measurable environmental impact on the environment.

Less than Significant Impact (L). The Project may have the potential for affecting the environment, although these impacts will be below levels or thresholds that UWCD or other responsible agencies consider to be significant.

Significant Impact but Mitigable to Less than Significant (S). The Project may have the potential to generate impacts that will have a significant impact on the environment. However, the level of impact would be reduced to levels that are less than significant with the implementation of mitigation measures.

Significant Unavoidable Impact (U). The Project may result in environmental impacts that are significant and cannot be reduced to levels that are less than significant even with the implementation of mitigation measures.

Beneficial Impact (B). The Project would result in an overall improvement to the existing baseline condition.

5.1.4 Formulation of Mitigation Measures and Mitigation Monitoring Program

When significant impacts are identified, feasible mitigation measures are formulated to eliminate or reduce the level of the impacts and focus on the protection of environmental resources. The effectiveness of a mitigation measure is subsequently determined by evaluating the impact remaining after its application. Those impacts meeting or exceeding the impact significance criteria after mitigation are considered residual impacts that remain significant. Implementation of more than one mitigation measure may be needed to reduce an impact below a level of significance. The mitigation measures recommended in this document are identified in the impact assessment sections and will be presented in a Mitigation Monitoring Program (MMP) in the Final EIR. Compliance with the regulatory framework is also considered in assessing the potential significance of an environmental impact, but the specific requirements are not identified as mitigation measures because they have a separate monitoring, reporting, and enforcement framework through the agency with jurisdiction.

5.1.5 Cumulative Impacts

Section 6, Summary of Cumulative Impacts, provides a list of other related future projects near the location of the proposed Project and alternatives. Each environmental resource category in Section 6 presents the cumulative impact scenario, the focus of which is to identify the potential impacts of the Project that might contribute to a significant impact when viewed in conjunction with the environmental impacts of other projects in the cumulative scenario.

5.1.6 Impacts of Alternatives

Section 4, Alternatives, provides a list, description, and map that identifies alternatives to the proposed Project. Each environmental resource category in Section 5, Environmental Analysis, presents the impact analysis for each alternative scenario. A summary of the collective impacts of each alternative in comparison with the impacts of the proposed Project is included in the Executive Summary, Table ES-2.

5.2 Aesthetics

Aesthetic resources are considered to be natural and man-made features visible to the public. This section describes the existing aesthetic quality of the project site and the surrounding area and discusses the potential impacts the Project may have on the scenic environment. Table 5.2-1 summarizes the impacts on aesthetics that would result from implementation of the Project or alternatives.

Table 5.2-1 Summary of Impacts on Aesthetics

Impact	Project	Labyrinth Alternative	No Project Alternative	Mitigation Measures
Impact AES-1: The Project could have a substantial adverse effect on a scenic vista.	Construction – L/Operation – L	Construction – L/Operation – L	Operation – O	None required
Impact AES-2: The Project could substantially degrade the existing visual character or quality of the site and its surroundings.	Construction – L/Operation – L	Construction – L/Operation – L	Operation – O	None required
Impact AES-3: The Project would create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.	Construction – L/Operation – O	Construction – L/Operation – O	Operation – O	None required
Project construction and operation would not create substantial damage to scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway.	Construction – O/Operation – O	Construction – O/Operation – O	Operation – O	None required

Note:

- O = No Impact
- L = Less than Significant Impact
- S = Significant Impact, but Mitigable to Less than Significant
- U = Significant Unavoidable Impact
- B = Beneficial Impact

5.2.1 Existing Conditions

Santa Felicia Dam is located in a rural setting, and the majority of the surrounding terrain is mountainous and uninhabited. The vegetation found at and immediately surrounding the Project site consists of shrub-dominated sage scrub and chaparral scrublands, non-native grassland, and ruderal areas. Woodlands, scrub and herbaceous communities are also present in the downstream riparian areas and wetlands. The Chaparral and sage scrub were largely found on south- and west-facing slopes with mixed chaparral, oak woodlands, and riparian communities on the north- and east-facing slopes (see Figure 5.5-1 in Section 5.5, Biological Resources).

The Ventura County General Plan for the Area of Piru Plan (Piru Area Plan; Ventura County 2011) designates State Highway 126, Main Street, Center Street, Piru Canyon Road, Guiberson Road, and Torrey Road as Local Scenic Roads. The dam is not visible from these roadways, except for Piru Canyon Road. Piru Canyon Road serves as a primary access route to Santa Felicia Dam and Lake Piru Reservoir, following the reservoir’s western border and entering the Los Padres National Forest. Figures 5.2-1 and 5.2-2 provide pictures of the views from Piru Canyon Road towards Santa Felicia Dam.

Lake Piru Reservoir, which is the reservoir formed by Santa Felicia Dam, is the dominant scenic feature in the Project area, with a surface area of 1,217 acres at an elevation of 1,055 feet msl. Lake Piru Reservoir is a well-visited recreational site with picnic areas, campgrounds, and water activities (UWCD 2009a).

Ventura County has designated the viewshed of Lake Piru Reservoir as a Scenic Resource Area and the mountain ridgelines surrounding the town of Piru for conservation (Figure 5.3-3; Ventura County 2011). The Santa Felicia Dam and Lake Piru Reservoir are visible from the Los Padres National Forest, which is located directly north of the Project area (PLIA 2017).



Source: Catalyst, August 4, 2017

Figure 5.2-1 Downstream View of Santa Felicia Dam from Piru Canyon Road

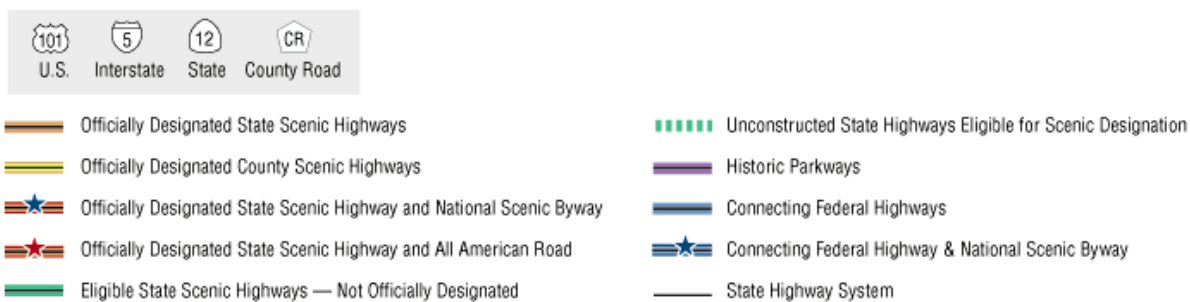


Source: Catalyst, August 4, 2017

Figure 5.2-2 Upstream Views of Santa Felicia Dam from Piru Canyon Road



Legend



Source: Caltrans n.d.

Figure 5.2-3 Designated and Eligible Scenic Highways in Ventura County

5.2.2 Regulatory Framework

5.2.2.1 *Federal*

No federal regulations related to aesthetics apply to this Project.

5.2.2.2 State

5.2.2.2.1 California Scenic Highway Program

The California Scenic Highway Program was established in 1963 with the goal of preserving and enhancing the natural beauty of California. Administered by Caltrans, this program includes the regulation of land use and development along scenic highways. There are no designated scenic highways within the vicinity of the Project; however, Highway 126, an undesignated but eligible scenic highway, is located approximately four miles south of Santa Felicia Dam without deviation. Santa Felicia Dam is not within the viewshed of Highway 126.

5.2.2.3 Local

Although Santa Felicia Dam is located in unincorporated Ventura County, it is exempt from local permit requirements because it is a water storage and power generation facility, and, as such, it is regulated by a license issued by FERC under the Federal Powers Act (FERC License No. 2153-CA). Therefore, the Project is not subject to the provisions of the Ventura County General Plan or other local plans. The description of relevant policies from the Piru Area Plan of the Ventura County General Plan below is provided for informational purposes.

5.2.2.3.1 Piru Area Plan

The Piru Area Plan designates State Highway 126, Main Street, Center Street, Piru Canyon Road, Guiberson Road, and Torrey Road as Local Scenic Roads (Figure 5.2-1). Of these roadways, Santa Felicia Dam is only visible from Piru Canyon Road, which triggers the following compliance criterion:

Discretionary development shall be designed consistent with the Piru Community Design Guidelines (Ventura County 2011), which includes the provision that no discretionary development shall be approved which would significantly degrade or destroy a scenic view of vista.

5.2.3 Impacts and Mitigation Measures

5.2.3.1 Significance Criteria

UWCD reviewed Appendix G of the CEQA Guidelines to determine whether the Project would result in significant impacts related to aesthetics. The criteria listed below consider if the Project would:

- a. Have a substantial adverse effect on a scenic vista.
- b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway.
- c. Substantially degrade the existing visual character or quality of the site and its surroundings.
- d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

The Project would not cause any impacts to State scenic highways, as there are none in the Project area. Therefore, criterion b is not evaluated further.

5.2.3.2 Proposed Project

Impact AES-1: The Project would not have a substantial adverse effect on a scenic vista (Construction – less than significant/Operation – less than significant).

Construction

The Project site is situated within a viewshed identified as a Scenic Resource Protection Zone by Ventura County, and Santa Felicia Dam and Lake Piru Reservoir are visible from Los Padres National Forest and Piru Canyon Road. Construction of the proposed facilities would involve demolition of existing outlet

works infrastructure as well as portions of the spillway chute infrastructure, construction of temporary access roads, excavation, staging, and construction of new facilities and infrastructure. These activities would primarily occur on the southern side of the dam and would not be visible from Los Padres National Forest. However, these areas would be visible from Piru Canyon Road. The construction phase for both components of the Project is anticipated to last 48 months, after which all disturbed areas would be reclaimed. Viewers from Piru Canyon Road would experience temporary adverse impacts; however, construction area represents a small portion of the overall viewshed experienced by travelers along Piru Canyon Road. Therefore, the aesthetic impacts during construction would be less than significant.

Operation

The proposed facilities (i.e., new outlet works, widened and/or deepened spillway, etc.) would blend in with the existing Santa Felicia Dam infrastructure and not draw new attention to the Project site. Viewers from Los Padres National Forest are unlikely to observe the new facilities from that vantage. Therefore, Project operations would result in less than significant effects on existing scenic vistas in the area.

Impact AES-2: The Project could substantially degrade the existing visual character or quality of the site and its surroundings (Construction – less than significant/Operation – less than significant).

Construction

Construction of the proposed facilities would involve demolition of existing outlet works infrastructure as well as portions of the spillway chute infrastructure, construction of temporary access roads, excavation, staging, and construction of new facilities and infrastructure. Staging and construction areas would be visible from Lake Piru Reservoir (during construction of the intake structure and the MSE wall), Piru Canyon Road, Rancho Temescal, and from hiking trails along Lake Piru Reservoir. Further, Lake Piru Reservoir would be temporarily lowered during the construction period. After the anticipated 48-month construction period, all disturbed areas would be reclaimed and water levels within Lake Piru Reservoir would be managed in accordance with existing operations. Therefore, the Project would cause temporary and less than significant impacts to aesthetics during construction activities.

Operation

During operation, the new intake structure, MSE wall, and floating bloom would be visible from Lake Piru Reservoir and areas of the Lake Piru Recreation Area, and the MSE wall and new spillway configuration would be visible from Rancho Temescal and Piru Canyon Road. However, these facilities would replace existing structures and be imbedded within the existing Santa Felicia Dam infrastructure. Therefore, there would be less than significant impacts to aesthetics during operation of the Project.

Impact AES-3: The Project would create a new source of substantial light or glare which would adversely affect day or nighttime views in the area (Construction – less than significant/Operation – no impact).

Construction

Construction equipment would introduce a new, temporary source of glare during daytime hours. In addition, certain tasks may require nighttime construction, which would introduce a new light source at night. However, these impacts would be less than significant as they would be localized and temporary, occurring only during construction hours and when nighttime construction is necessary.

Operation

Project operations would not result in new light sources and would not have an effect on the day or night time scenic environment. The new facilities would not result in introducing a new source of glare, as there

are no building materials proposed that would generate reflection. Therefore, operation of the Project would have no impact with respect to creating a new source of substantial light or glare.

5.2.3.3 *Labyrinth Alternative*

The construction requirements would be similar to the requirements provided for the Project with the exception that the dam crest would not need to be raised and it would involve substantially more demolition and concrete placement. Accordingly, aesthetic impacts associated with the Labyrinth Alternative would be similar in extent and intensity as those described above for the Project for each significance criteria. Operation of this alternative would be the same as that for the proposed Project.

5.2.3.4 *No Project Alternative*

Under the No Project alternative, no changes to the existing dam infrastructure would be made; therefore, there would be no impact to aesthetics.

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5.3 Agricultural and Forestry Resources

This section focuses on the agricultural and forestry resources in the vicinity of the Project, including Prime Farmland, Unique Farmland, Farmland of Statewide Importance, Williamson Act contracts, and timberland. Potential Project-related impacts on these and other agricultural resources are analyzed.

Table 5.3-1 Summary of Impacts on Agricultural and Forestry Resources

Impact	Project	Labyrinth Alternative	No Project Alternative	Mitigation Measures
The Project would not 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.	Construction – O/Operation - O	Construction – O/Operation - O	Operation - O	None required
The Project would not conflict with existing zoning for agricultural use, or a Williamson Act Contract.	Construction – O/Operation - O	Construction – O/Operation - O	Operation - O	None required
The Project would not conflict with existing zoning for or cause rezoning of, forest land (as defined in Public Resources Code §4526), or zoned timberland production (as defined by Government Code §51104[g]).	Construction – O/Operation - O	Construction – O/Operation - O	Operation - O	None required
The Project would not result in the loss of forest land or the conversion of forest land to a non-forest use.	Construction – O/Operation - O	Construction – O/Operation - O	Operation - O	None required
The Project would not involve other changes in the existing environment that, due to their location or nature, may result in conversion of farmland to non-agricultural use.	Construction – O/Operation - O	Construction – O/Operation - O	Operation - O	None required

Note:

- O = No Impact
- L = Less than Significant Impact
- S = Significant Impact, but Mitigable to Less than Significant
- U = Significant Unavoidable Impact
- B = Beneficial Impact

5.3.1 Existing Conditions

Agriculture is an integral part of the Ventura County economy. In 2016 (the most recent year recorded and published) the County’s estimated value of crops was \$2.1 billion produced by over 2,500 individual farms. Based on this value, Ventura County ranks 10th in California and 11th in the United States with respect to total crop value (Ventura County Farm Bureau 2018). The majority of the land dedicated to agriculture is focused in the southern half of Ventura County and along the Santa Clara River, which stretches from the Pacific Ocean to the eastern county boundary. Lake Piru Reservoir and the Santa Felicia Dam are located in Open Space along the eastern county boundary just north of the Santa Clara River (Ventura County 2011). Piru Creek feeds into the Santa Clara River which is used for irrigation by the Ventura County agricultural community (Ventura County Farm Bureau 2017). There are no agricultural resources, farmland, Williamson Act contracts, forest land, or timberland located within the Project site or immediately adjacent.

5.3.2 Regulatory Framework

5.3.2.1 *Federal*

Congress passed the Farmland Protection Policy Act in 1981 in response to a substantial decrease in the amount of open farmland (7 United States Code [U.S.C.] 4201 et seq.). Under the Farmland Protection Policy Act, the Secretary of Agriculture established criteria for use by federal agencies to consider effects on farmland. As stipulated by the Farmland Protection Policy Act, Federal agencies are to (1) use the criteria to identify and account for the adverse effects of their programs on the preservation of farmland; (2) consider alternative actions, as appropriate, that could lessen adverse effects; and (3) ensure that their programs, to the extent practicable, are compatible with state, units of local government, and private programs and policies to protect farmland (7 U.S.C. 658.1).

5.3.2.2 *State*

Conservation of agricultural land in California is supported at the state level through the Division of Land Resource Protection and specifically through the Farmland Mapping and Monitoring Program (FMMP) and the California Land Conservation Act of 1965 (commonly referred to as the Williamson Act). For the FMMP, U.S. Department of Agriculture soils surveys and existing land use observations recorded during even-numbered years are used to determine the nature and quality of farmland in 10-acre minimum units across the state. FMMP mapping categories for the most important statewide farmland include Prime Farmland, Farmland of Statewide Importance, and Unique Farmland. Other classifications include Farmland of Local Importance and Grazing Land. FMMP data are used in elements of some county and city general plans and associated environmental documents as a way of assessing the impacts of development on farmland and in regional studies for assessing impacts due to agricultural land conversion.

The Williamson Act enables local governments to enter into ongoing, minimum 10-year contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or compatible uses. In return, restricted parcels are assessed for property tax purposes at a rate consistent with their actual farming and open space uses, as opposed to potential market value.

5.3.2.3 *Local*

The Farmland Resources section of the Ventura County General Plan (Ventura County 2016a) contains several goals and policies related to agriculture. In particular, Goal 1 is to “[p]reserve and protect irrigated agricultural lands as a nonrenewable resource to assure the continued availability of such lands for the production of food, fiber and ornamentals.” In addition, the following policies may be applicable:

- > Policy 1: Discretionary development located on land designated as Agricultural (see Land Use Chapter) and identified as Prime Farmland or Farmland of Statewide Importance on the State’s Important Farmland Inventory, shall be planned and designed to remove as little land as possible from potential agricultural production and to minimize impacts on topsoil.
- > Policy 6: Discretionary development adjacent to Agricultural-designated lands shall not conflict with agricultural use of those lands.

In addition, the Public Facilities and Services Chapter of the Ventura County General Plan contains one policy related to agriculture, stipulating that “[a]ll transmission lines should be located and constructed in a manner which minimizes disruption of ... agricultural activities” (Policy 4.5.2 [2], Ventura 2016a).

5.3.3 Impacts and Mitigation Measures

5.3.3.1 Significance Criteria

UWCD reviewed Appendix G of the CEQA Guidelines to determine significance criteria to assess whether the Project would have a significant impact on agricultural or forestry resources. The criteria listed below consider if the Project would:

- a. Convert Prime Farmland, Unique Farmland or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use.
- b. Conflict with existing zoning for agricultural use, or a Williamson Act Contract.
- c. Conflict with existing zoning for or cause rezoning of, forest land (as defined in PRC Section 4526), or zoned timberland production (as defined by Government Code Section 51104[g]).
- d. Result in the loss of forest land or the conversion of forest land to a non-forest use.
- e. Involve other changes in the existing environment that, due to their location or nature, may result in conversion of farmland to non-agricultural use.

Construction and operation of the proposed Project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use. The Project footprint is not located on, or immediately adjacent to, Prime Farmland, Unique Farmland, or Farmland of Statewide Importance as defined by the Farmland Mapping and Monitoring Program. There are sporadic patches of Prime Farmland that exist roughly 0.25 mile southwest of the Project site, but these would not be affected by the proposed Project. Therefore, Project activities would not conflict with existing zoning for agricultural use or a Williamson Act contract. The land parcel where the current dam and spillway exist is zoned as OS-160 ac/SRP (Open Space with a 160-acre minimum and Scenic Resource Protection) (Ventura County 2017a). Furthermore, Santa Felicia Dam is classified as "Urban and Built-up Land" on Ventura County Land Conservation Act maps (California Department of Conservation 2015). The Project would not result in changes to the existing environment that, due to their location or nature, would result in conversion of farmland to non-agricultural use. The Project would not alter or impede existing agricultural operations, including grazing. As such, there would be no adverse effects to, or conversion of, agricultural lands, and no impacts would occur under any of the criteria listed above.

5.3.3.2 Proposed Project

As described above, no impacts would occur to agricultural resources under the proposed Project.

5.3.3.3 Labyrinth Alternative

Construction and operations associated with the Labyrinth Alternative would be similar to those described under the proposed Project with respect to agriculture and forestry, and would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use or result in other impacts to agricultural lands. Therefore, no impact would occur, as described for the proposed Project.

5.3.3.4 No Project Alternative

The No Project Alternative would not result in any construction efforts or changes to existing dam operations. Therefore, there would be no conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use. Surrounding agricultural land designations would remain in their current state. Accordingly, no direct impacts to agricultural lands would occur under the No Project alternative.

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5.4 Air Quality

This section discusses the potential impacts on air quality that could result from the Project. Table 5.4-1 summarizes the impacts on air quality that would result from implementation of the Project or alternatives. Appendix A provides the summary emissions reports, including emissions data, factors, and calculations.

Table 5.4-1 Summary of Impacts on Air Quality

Impact	Project	Labyrinth Alternative	No Project Alternative	Mitigation Measures
Impact AQ-1: The Project's ozone precursor emissions would not contribute substantially to an existing air quality violation.	Construction – S/Operation – O	Construction – S/Operation – O	Operation - O	MM AQ-1: Implement ROC and NO _x construction mitigation measures
Impact AQ-2: The Project's PM ₁₀ emissions would not contribute substantially to an existing air quality violation.	Construction – S/Operation – O	Construction – S/Operation – O	Operation - O	MM AQ-2: Prepare and implement a fugitive dust control plan.
Impact AQ-3: The Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment.	Construction – L/Operation – O	Construction – L/Operation – O	Operation - O	None required
Impact AQ-4: The Project would not expose sensitive receptors to substantial pollutant concentrations.	Construction – L/Operation – O	Construction – L/Operation – O	Operation - O	None required
Impact AQ-5: The Project would not create objectionable odors affecting a substantial number of people.	Construction – L/Operation – O	Construction – L/Operation – O	Operation - O	None required
The Project would not conflict with or obstruct the applicable air quality plan.	Construction – O/Operation – O	Construction – O/Operation – O	Operation – O	None required

Note:

- O = No Impact
- L = Less than Significant Impact
- S = Significant Impact, but Mitigable to Less than Significant
- U = Significant Unavoidable Impact
- B = Beneficial Impact

5.4.1 Existing Conditions

The Project site is located approximately 4.5 miles northeast of the unincorporated town of Piru in Ventura County within the South Central Coast Air Basin (SCCAB). The SCCAB includes Ventura, San Luis Obispo, and Santa Barbara counties. Air quality in Ventura County is regulated by the Ventura County Air Pollution Control District (VCAPCD). Except where specifically noted in the text, the information regarding existing conditions is based on the Ventura County Air Quality Assessment Guidelines (VCAQAG) (VCAPCD 2003).

The US Environmental Protection Agency (USEPA) and California Air Resources Board (CARB) have established ambient air quality standards to protect the health and welfare of the general public. Regions throughout the State and country are classified as being either attainment or nonattainment for specific criteria pollutants, depending on the number of times an air quality standard is exceeded. Table 5.4-2 shows Federal and State air quality standards for criteria pollutants.

Table 5.4-2 Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards		National Standards	
		ppm	µg/m ³	ppm	µg/m ³
Ozone (O ₃)	1-hour	0.09	177	--	--
	8-hour	0.07	137	0.070	137
Nitrogen Dioxide (NO ₂)	1-hour	0.18	338	0.100	188
	Annual	0.03	56	0.053	100
Sulfur Dioxide (SO ₂)	1-hour	0.25	655	0.075	196
	3-hour (secondary) ¹	--	--	0.5	1,300
	24-hour	0.04	105	0.14	0.030
	Annual arithmetic mean	--	--	0.03	--
Carbon Monoxide (CO)	1-hour	20	0.020	35	0.040
	8-hour	9	0.023	9	0.010
Particulates (as PM ₁₀)	24-hour	--	50	--	150
	Annual arithmetic mean	--	20	--	--
Particulates (as PM _{2.5})	24-hour	--	--	--	35
	Annual	--	12	--	12
Lead (Pb)	30-day	--	1.5	--	--
	Calendar average	--	--	--	1.5 (for certain areas)
	3-month (rolling average) ²	--	--	--	1.5
Sulfates (as SO ₄)	24-hour	--	25	--	--
Hydrogen Sulfide (H ₂ S)	1-hour	0.03	42	--	--
Vinyl Chloride (C ₂ H ₃ Cl)	24-hour	0.01	26	--	--
Visibility Reducing Particles	8-hour	Extinction coefficient of 0.23 per kilometer; visibility of 10 miles or more (0.07 to 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent.		--	--

¹ Primary air quality standards are established to protect human (public) health. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

² A rolling average is a calculation to analyze data points by creating series of averages of different subsets of the full data set.

Source: CARB 2017a

Notes: ppm = part(s) per million; µg/m³ = microgram(s) per cubic meter

Ventura County is an attainment area for the standards shown in the Table 5.4-2, except as shown in Table 5.4-3.

Table 5.4-3 State and Federal Nonattainment Pollutants, Ventura County

Pollutant	Standard	Attainment Status
Ozone	1 hour	State Nonattainment
	8 hour	Federal and State Nonattainment
Particulate Matter (PM ₁₀)	24 hour	State Nonattainment
	Annual Arithmetic Mean	State Nonattainment

Source: VCAPCD 2017a

5.4.1.1 Meteorological Factors Affecting Air Quality

The air above Ventura County often exhibits weak vertical and horizontal dispersion characteristics, which limit the dispersion of emissions and cause increased ambient air pollutant levels. Persistent temperature inversions prevent vertical dispersion; the inversions act as a “ceiling” that prevents pollutants from rising and dispersing. Mountain ranges act as “walls” that inhibit horizontal dispersion of air pollutants. The diurnal land/sea breeze pattern common in Ventura County recirculates air contaminants. Air pollutants are pushed toward the ocean during the early morning by the land breeze, and toward the east during the afternoon by the sea breeze. This creates a “sloshing” effect, causing pollutants to remain in the area for several days. Residual emissions from previous days accumulate and chemically react with new emissions in the presence of sunlight, thereby increasing ambient air pollutant levels. This pollutant “sloshing” effect happens most predominantly from May through October (“smog” season). Air temperatures are usually higher and sunlight more intense during the “smog” season, causing Ventura County to experience the most exceedances of the State and Federal ozone standards during this six-month period.

5.4.1.2 Effects of Air Pollution

Ambient air pollution is a major public health concern and is linked to respiratory illness and an increase in mortality rates. According to the CARB, 80,000 deaths that occur each year in California may be attributed to illnesses aggravated by air pollution. Air pollution is also responsible for a reduction in worker efficiency.

In addition to public health impacts, many of the major agricultural crops grown in California, including Ventura County, are significantly damaged by air pollution, which causes 20 to 50 percent of losses in some crop yields. Areas in California where plant damage from air pollution has been reported coincides with the areas of highest population density. These areas include a triangular zone extending from the Mexican border to approximately 80 miles north and eastward of Ventura.

Air pollution is also known to harm major native plant groups, including flowering plants, conifers, ferns, mosses, lichens, and fungi, and can affect the total yield and quality of forage and range, which presents serious consequences for the State’s livestock industry.

In addition to human health and vegetation, air pollution damages materials such as plastics, rubber, paint, and metals. Damage includes erosion and discoloration of paint, cracking of rubber, corrosion of metals and electrical components, soiling and decay of building stone and concrete, fading, a reduction of tensile strengths of fabrics, and soiling and crumbling of nonmetallic building materials. High smog concentrations significantly shorten the lifespan of materials, which increases maintenance and replacement costs.

5.4.1.3 Criteria Air Pollutants

A criteria air pollutant is any air pollutant for which ambient air quality standards have been set by the USEPA or CARB. The presence of these pollutants in ambient air is generally due to numerous diverse and widespread sources of emissions, and air quality standards have been established for these pollutants to protect public health. Criteria pollutants include ozone (O₃), fine particulate matter (PM_{2.5}), respirable particulate matter (PM₁₀), carbon monoxide (CO), nitrogen dioxide (NO₂), lead (Pb), sulfur dioxide (SO₂), visibility-reducing particles, sulfates, and hydrogen sulfide (H₂S). The sections below provide additional details about each of these criteria pollutants.

5.4.1.3.1 Ozone

Ozone is formed in the atmosphere by a series of complex chemical reactions and transformations in the presence of sunlight. Oxides of nitrogen (NO_x) and reactive organic compounds (ROC) are the principal constituents in these reactions. Ozone is a pungent, colorless, toxic gas and is the major air pollutant of concern in Ventura County.

Ozone is known as a secondary pollutant because it is formed in the atmosphere through a complex series of chemical reactions, rather than emitted directly into the air. NO_x and ROCs are the primary ozone precursors. The major sources of NO_x in Ventura County are motor vehicles and other combustion processes. The major sources of ROCs in Ventura County are motor vehicles, cleaning and coating operations, petroleum production and marketing operations, and solvent evaporation.

Ozone is a strong irritating gas that can chemically burn and cause narrowing of airways, forcing the lungs and heart to work harder to provide oxygen to the body. A powerful oxidant, ozone is capable of destroying organic matter – including human lung and airway tissue; it essentially burns through cell walls. Ozone damages cells in the lungs, making the passages inflamed and swollen. Ozone also causes shortness of breath, nasal congestion, coughing, eye irritation, sore throat, headache, chest discomfort, breathing pain, throat dryness, wheezing, fatigue, and nausea. It can damage alveoli, the individual air sacs in the lungs where oxygen and carbon dioxide are exchanged. Ozone has been associated with a decrease in resistance to infections. People most likely to be affected by ozone include the elderly, the young, and athletes. Ozone also poses a health risk to people who already suffer from respiratory diseases such as asthma, emphysema, and chronic bronchitis.

5.4.1.3.2 Particulate Matter 10 Microns or Smaller in Diameter (PM₁₀)

PM₁₀ consists of particulate matter (fine dusts and aerosols) ten microns or smaller in aerodynamic diameter. Ten microns is about one-seventh the width of a human hair. When inhaled, particles larger than 10 microns are generally caught in the nose and throat and do not enter the lungs. PM₁₀ gets into the large upper branches of the lungs just below the throat, where they are caught and removed by coughing, spitting, or swallowing.

The primary sources of PM₁₀ include dust, paved and unpaved roads, diesel exhaust, acidic aerosols, construction and demolition operations, soil and wind erosion, agricultural operations, residential wood combustion, and smoke. Secondary sources of PM₁₀ include tailpipe emissions and industrial sources. These sources have different constituents, and therefore, varying effects on health. Road dust is composed of many particles other than soil dust. It also includes engine exhaust, tire rubber, oil, and truck load spills. Diesel exhaust contains many toxic particle and elemental carbon (soot) and is considered a toxic air contaminant in California. Airborne particles absorb and adsorb toxic substances and can be inhaled and lodge in the lungs. Once in the lungs, the toxic substances can be adsorbed into the bloodstream and carried throughout the body. PM₁₀ concentrations tend to be lower during the winter months because meteorology greatly affects PM₁₀ concentrations. During rain, concentrations are relatively low, and on windy days, PM₁₀ levels can be high. Photochemical aerosols, formed by chemical reactions of manmade emissions, may also influence PM₁₀ concentrations.

Elevated ambient particulate levels are associated with premature death, an increased number of asthma attacks, reduced lung function, aggravation of bronchitis, respiratory disease, cancer, and other serious health effects. Short-term exposure to particulates can lead to coughing, minor throat irritation, and a reduction in lung function. Long-term exposure can be more harmful. The USEPA estimates that 8 percent of urban non-smoker lung cancer risk is due to PM₁₀ in soot from diesel trucks, buses, and cars. Additional studies by the USEPA and the Harvard School of Public Health estimate that 50,000 to 60,000 deaths per year in the United States are caused by particulates (VCAPCD 2003). PM₁₀ particles collect in the upper portion of the respiratory system, affecting the bronchial tubes, nose, and throat. They contribute to aggravation of asthma, premature death, increased number of asthma attacks, bronchitis, reduced lung function, respiratory disease, aggravation of respiratory and cardiovascular disease, alteration of lung tissue and structure, changes in respiratory defense mechanisms, and cancer.

5.4.1.3.3 Particulate Matter 2.5 Microns or Smaller in Diameter (PM_{2.5})

PM_{2.5} is a mixture of particulate matter (fine dusts and aerosols) 2.5 microns or smaller in aerodynamic diameter; 2.5 micrometers is approximately 1/30 the size of a human hair, so small that several thousand of them could fit on the period at the end of this sentence. Particles 2.5 microns or smaller in diameter are able to travel into the deepest portions of the lungs where gas exchange occurs between the air and the blood stream. These are the most dangerous particles because the deepest portions of the lungs have no efficient mechanisms for removing them. If these particles are soluble in water, they pass directly into the blood stream within minutes. If they are not soluble in water, they are retained deep in the lungs and can remain there permanently.

PM_{2.5} particles are emitted from activities such as industrial and residential combustion processes, wood burning, and from diesel and gasoline-powered vehicles. They are also formed in the atmosphere from gases such as sulfur dioxide, nitrogen oxides, ammonia, and volatile organic compounds that are emitted from combustion activities, and then become particles as a result of chemical transformations in the air (secondary particles).

PM_{2.5} increases the risks of long-term diseases, including chronic respiratory disease, and cancer, as well as premature death. Other effects include increased respiratory stress and disease, decreased lung function, alterations in lung tissue and structure, and alterations in respiratory tract defense mechanisms.

5.4.1.3.4 Carbon Monoxide

Carbon monoxide is a common colorless, odorless, highly toxic gas. It is produced by natural and anthropogenic combustion processes. The major source of CO in urban areas is incomplete combustion of carbon containing fuels (primarily gasoline, diesel fuel, and natural gas). However, it also results from combustion processes, including forest fires and agricultural burning. Over 80 percent of the CO emitted in urban areas is contributed by motor vehicles. Ambient CO concentrations are generally higher in the winter, usually on cold, clear days and nights with little or no wind. Low wind speeds inhibit horizontal dispersion, and surface inversions inhibit vertical mixing. Traffic-congested intersections have the potential to result in localized high levels of CO. These localized areas of elevated CO concentrations are termed CO "hotspots." CO hotspots are defined as locations where ambient CO concentrations exceed the State Ambient Air Quality Standards (20 ppm, 1-hour; 9 ppm, 8-hour).

When inhaled, CO does not directly harm the lungs. The impact from CO is on oxygenation of the entire body. CO combines chemically with hemoglobin, the oxygen-transporting component of blood. This diminishes the ability of blood to carry oxygen to the brain, heart, and other vital organs. Red blood cells have 220 times the attraction for CO than for oxygen. This affinity interferes with movement of oxygen to the body's tissues. Effects from CO exposure include headaches, nausea, and death. People with heart ailments are at risk from low-level exposure to CO. Also sensitive are people with chronic respiratory disease, the elderly, infants and fetuses, and people suffering from anemia and other conditions that

affect the oxygen-carrying capacity of blood. High levels of CO in a concentrated area can result in asphyxiation. Studies show a synergistic effect when CO and ozone are combined.

5.4.1.3.5 Nitrogen Dioxide

Nitrogen dioxide is formed in the atmosphere primarily by the rapid reaction of the colorless gas nitric oxide (NO) with atmospheric oxygen. It is a reddish-brown gas with an odor similar to that of bleach. NO₂ participates in the photochemical reactions that result in ozone. The greatest source of NO, and subsequently NO₂, is the high-temperature combustion of fossil fuels such as in motor vehicle engines and power plant boilers. NO₂ and NO are referred to collectively as NO_x.

NO₂ can irritate and damage the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections such as influenza. Researchers have identified harmful effects similar to those caused by ozone, with progressive changes over 4 hours of exposure. Negative health effects are apparent after exposure to NO₂ levels as low as 0.11 ppm for a few minutes. This level of exposure may elicit or alter sensory responses. Higher concentrations (0.45 - 1.5 ppm) may cause impaired pulmonary function, increased incidence of acute respiratory disease, and difficult breathing for both bronchitis sufferers and healthy persons.

5.4.1.3.6 Lead

Lead is a bluish-gray metal that occurs naturally in small quantities. Lead also occurs in a variety of compounds such as lead acetate, lead chloride, lead chromate, lead nitrate, and lead oxide. Pure lead is insoluble in water. However, some lead compounds are water soluble. Lead and lead compounds in the atmosphere often come from fuel combustion sources, such as the burning of solid waste, coal, and oils. Historically, the largest source of lead in the atmosphere resulted from the combustion of leaded gasoline in motor vehicles. However, with the phase-out of leaded gasoline, concentrations of lead in the air have substantially decreased. Industrial sources of atmospheric lead include steel and iron factories, lead smelting and refining, and battery manufacturing. Atmospheric lead may also result from lead in entrained dust and dirt contaminated with lead. Lead-based paints were commonly used in the past, and lead paint chips or dust can be inhaled or ingested.

Acute health effects of lead may include gastrointestinal distress (such as colic), brain and kidney damage, and even death. Lead also has numerous chronic health effects, including anemia, central nervous system damage, and male and female reproductive dysfunction, as well as effects on blood pressure, kidney function, and vitamin D metabolism. Developing fetuses and children are particularly sensitive to lower concentrations of blood lead, and the effects may include increased risk of pre-term delivery, low birth weight, and the impairment of hearing, growth, and mental development. The USEPA's Office of Air Quality Planning and Standards ranks lead as a "high concern" pollutant based on its severe chronic toxicity. Human studies regarding the cancer risks of lead have been inconclusive. However, the USEPA considers lead to be a probable human carcinogen.

5.4.1.3.7 Sulfur Dioxide

Sulfur dioxide is a colorless gas with a sharp, irritating odor. It can react in the atmosphere to produce sulfuric acid and sulfates, which contribute to acid deposition and atmospheric visibility reduction. It also contributes to the formation of PM₁₀. Most of the SO₂ emitted into the atmosphere is from burning sulfur containing fossil fuels by mobile sources such as marine vessels and farm equipment, and stationary fuel combustion.

SO₂ irritates the mucous membranes of the eyes and nose, and may also affect the mouth, trachea, and lungs. Healthy people may experience sore throats, coughing, and breathing difficulties when exposed to high concentrations. SO₂ causes constriction of the airways and poses a health hazard to asthmatics, who are very sensitive to SO₂. Research indicates that normally breathing asthmatics performing moderate to heavy exercise will experience SO₂-induced bronchoconstriction (breathing difficulties) when

breathing SO₂ for at least 5 minutes at concentrations lower than 1 part per million. Consecutive SO₂ exposures (repeated within 30 minutes or less) result in a diminished response compared with the initial exposure. Children often experience more respiratory tract infections when they are exposed to SO₂.

5.4.1.4 Toxic Air Contaminants

Toxic air contaminants (TACs), also referred to as hazardous air pollutants, are air pollutants (excluding O₃, CO, SO₂, and NO₂) that may reasonably be anticipated to cause cancer, developmental effects, reproductive dysfunction, neurological disorders, heritable gene mutations, or other serious or irreversible acute or chronic health effects in humans. TACs are regulated under different Federal and State regulatory processes than ozone and the other criteria air pollutants. Health effects of TACs may occur at extremely low levels and it is typically difficult to identify levels of exposure that do not produce adverse health effects. TACs generally consist of four types: organic chemicals, such as benzene, dioxins, toluene, and perchloroethylene; inorganic chemicals such as chlorine and arsenic; fibers such as asbestos; and metals such as mercury, cadmium, chromium, and nickel. These air contaminants are defined by the USEPA, the State of California, and other governmental agencies. Currently, more than 900 substances are regulated TACs under Federal, State, and local regulations.

Toxic air contaminants are produced by a great variety of sources, including industrial facilities such as refineries, chemical plants, chrome plating operations, and surface coating operations; commercial facilities such as dry cleaners and gasoline stations, motor vehicles, especially diesel-powered vehicles; and, consumer products. TACs can be released as a result of normal industrial operations, as well as from accidental releases during process upset conditions.

Health effects from TACs vary with the type of pollutant, the concentration of the pollutant, the duration of exposure, and the exposure pathway. TACs usually get into the body through breathing, although they can also be ingested, or absorbed through the skin. Adverse effects on people tend to be either acute (short-term) or chronic (long-term). Acute effects result from short-term, high levels of airborne toxic substances. These effects may include nausea, skin irritation, cardiopulmonary distress, and even death. Chronic effects result from long-term, low level exposure to airborne toxic substances. Effects can range from relatively minor to life-threatening. Less serious chronic effects can include skin rashes, dry skin, coughing throat irritation, and headaches. More serious chronic effects can include lung, liver, and kidney damage; nervous system damage; miscarriages, and genetic and birth defects; and, cancer. Many TACs can have both carcinogenic and non-carcinogenic health effects.

5.4.1.5 Other Issues of Concern

5.4.1.5.1 Odors

Odors are substances in the air that pose a nuisance to nearby land uses such as residences, schools, daycare centers, and hospitals. Odors are typically not a health concern but can interfere with the use and enjoyment of nearby property.

Odors may be generated by a wide variety of sources. Following are examples of facilities and operations that may generate significant odors:

- > Wastewater treatment facilities
- > Sanitary landfills
- > Transfer stations
- > Composting facilities
- > Asphalt batch plants
- > Painting and coating operations

- > Fiberglass operations
- > Food processing facilities
- > Feed lots/ dairies
- > Petroleum extraction, transfer, processing, and refining operations and facilities
- > Chemical manufacturing operations and facilities
- > Rendering plants

Objectionable odors created by a facility or operation may cause a nuisance or annoyance to surrounding populations.

5.4.1.5.2 Fugitive Dust

Fugitive dust refers to solid particulate matter that becomes airborne because of wind action and human activities. Fugitive dust particles are mainly soil minerals, but also can be sea salt, pollen, spores, tire particles, etc. About half of fugitive dust particles (by weight) are larger than 10 microns and settle quickly. Fugitive dust particles 10 microns or smaller can remain airborne for weeks.

The primary sources of fugitive dust are grading and excavation operations associated with road and building construction, aggregate mining and processing operations, and sanitary landfill operations. Unpaved roadways also are a large source of fugitive dust. Other sources of fugitive dust include demolition activities, unpaved roadway shoulders, vacant lots, material stockpiles, abrasive blasting operations, and offroad vehicles. The amount of fugitive dust created by such activities is dependent largely on the type of soil, type of operation taking place, size of the area, degree of soil disturbance, soil moisture content, and wind speed.

When fugitive dust particles are inhaled, they can travel easily to the deep parts of the lungs and may remain there, causing respiratory illness, lung damage, and even premature death in sensitive people. Fugitive dust also may be a nuisance to those living and working nearby. Dust blown across roadways can lead to traffic accidents by reducing visibility. Fugitive dust can soil and damage materials and property, such as fabrics, vehicles, and buildings. Particulates deposited on agricultural crops can lower crop quality and yield. Additionally, fugitive dust can carry the coccidioides fungal spores that cause San Joaquin Valley Fever. When inhaled into the lungs, the fungi can cause flu-like symptoms. In more severe cases, the infection can develop into chronic pneumonia and also disseminate into other parts of the body, resulting in painful lesions in the bones, meningitis, and other symptoms.

5.4.1.6 Sensitive Receptors

Certain population groups are considered more sensitive to air pollutants than others; in particular, children, elderly, and acutely ill and chronically ill persons, especially those with cardiorespiratory diseases such as asthma and bronchitis. Sensitive receptors (land uses) indicate locations where such individuals are typically found, namely schools, day care centers, hospitals, convalescent homes, residences of sensitive persons, and parks with active recreational uses, such as youth sports.

Persons engaged in strenuous work or physical exercise also have increased sensitivity to poor air quality. Residential areas are considered more sensitive to air quality conditions than commercial and industrial areas because people generally spend longer periods of time at their residences, resulting in greater exposure to ambient air quality conditions. Recreational uses such as parks are also considered sensitive due to the greater exposure to ambient air quality conditions, and because the presence of pollution detracts from the recreational experience.

Sensitive receptors within one mile of the Santa Felicia Dam include visitors to Lake Piru Reservoir, the Rancho Temescal Equestrian Center, filming operations on Rancho Temescal, two residences located on

the Rancho Temescal property immediately downstream of the dam, the dam tender residence located onsite, and rural residents within 1,000 feet of the centerline of Piru Canyon Road as shown in Figure 5.13-1.

5.4.2 Regulatory Framework

5.4.2.1 *Federal*

5.4.2.1.1 Clean Air Act

The Federal Clean Air Act (CAA) was passed by Congress in 1970 and last amended in 1990. The CAA gives the Federal government authority, by way of the USEPA, to establish air quality standards. The USEPA is responsible for implementing most aspects of the CAA, including setting National Ambient Air Quality Standards (NAAQS) for major air pollutants; setting hazardous air pollutant standards; approving State attainment plans; setting motor vehicle emission standards; issuing stationary source emission standards and permits; and establishing acid rain control measures, stratospheric O₃ protection measures, and enforcement provisions. NAAQS are established for criteria pollutants under the CAA, which are O₃, CO, NO₂, SO₂, PM₁₀, PM_{2.5}, and lead.

The NAAQS describe acceptable air quality conditions designed to protect the health and welfare of the citizens of the nation. The NAAQS (other than for O₃, NO₂, SO₂, PM₁₀, PM_{2.5}, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. NAAQS for O₃, NO₂, SO₂, PM₁₀, and PM_{2.5} are based on statistical calculations over one- to three-year periods, depending on the pollutant. The CAA requires the USEPA to reassess the NAAQS at least every five years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that exceed the NAAQS must prepare a State implementation plan that demonstrates how those areas will attain the standards within mandated time frames.

5.4.2.2 *State*

5.4.2.2.1 California Clean Air Act

The Federal CAA delegates the regulation of air pollution control and the enforcement of the NAAQS to the states. In California, the task of air quality management and regulation has been legislatively granted to the CARB, with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. The CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for ensuring implementation of the California Clean Air Act of 1988, responding to the Federal CAA, and regulating emissions from motor vehicles and consumer products.

The CARB has established California Ambient Air Quality Standards (CAAQS), which are generally more restrictive than the NAAQS. Air quality is considered "in attainment" if pollutant levels are continuously below the CAAQS and violate the standards no more than once each year. The CAAQS for O₃, CO, SO₂ (1-hour and 24-hour), NO₂, PM₁₀, PM_{2.5}, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. The NAAQS and CAAQS are presented in Table 5.4-2.

5.4.2.2.2 Off-road Engine Standards

The CARB regulates mobile sources of air pollution in the State of California. Self-propelled, off-road construction equipment is considered a vehicle, as defined by the California Vehicle Code. A vehicle may have an engine that both propels the vehicle and powers equipment mounted on the vehicle. As such, vehicles are generally exempt from regulation by local air districts. However, not included in exemption provisions is any equipment mounted on a vehicle that would otherwise require a permit per VCAPCD's rules and regulations.

Federal Tier 1 standards for off-road diesel engines were adopted as part of the California requirements for 1995. Federal Tier 2 and Tier 3 standards were adopted in 2000 and selectively apply to the full range of diesel off-road engine power categories. Both Tier 2 and 3 standards include durability requirements to ensure compliance with the standards throughout the useful life of the engine (40 CFR sections 89.112, 13; California Code of Regulations [CCR] section 2423).

On May 11, 2004, the USEPA signed the final rule implementing Tier 4 emission standards, which are to be phased-in over the period between 2008 and 2015 (69 Federal Register 38957-39273, 29 June 2004). The Tier 4 standards require that PM and NO_x emissions be further reduced by approximately 90-percent. Such emission reductions can be achieved through the use of advanced control technologies – including advanced exhaust gas after treatment similar to those required by the 2007–2010 standards for highway diesel engines.

5.4.2.2.3 Air Toxics Control Measures

On July 26, 2007, the CARB adopted a regulation to reduce diesel particulate matter (DPM) and NO_x emissions from in-use (existing) off-road heavy-duty diesel vehicles in California. Such vehicles are used in construction, mining, and industrial operations. This regulation supplements existing tiered emission standards for off-road diesel engines in California.

5.4.2.2.4 Portable Equipment Registration Program

The statewide Portable Equipment Registration Program establishes a uniform program to regulate portable engines and portable engine-driven equipment units. Once registered, engines and equipment units may operate throughout the State of California without the need to obtain individual permits from local air districts. Owners or operators of portable engines and certain types of equipment can register their units under the PERP to operate their equipment anywhere in the State.

5.4.2.3 Local

The VCAPCD is primarily responsible for planning, implementing, and enforcing Federal and State ambient air quality standards within the Ventura County portion of the SCCAB. As part of its planning responsibilities, VCAPCD prepares an Air Quality Management Plan (AQMP), Rules and Regulations to regulate sources of air pollution in Ventura County, and the VCAQAG.

5.4.2.3.1 Ventura County Air Quality Management Plan

Pursuant to the Federal CAA Amendments of 1990, the 2016 Ventura County AQMP presents Ventura County's: (1) strategy to attain the 2008 Federal 8-hour ozone standard; (2) attainment demonstration for the Federal 8-hour ozone standard; and (3) reasonable further progress demonstration for the Federal 8-hour ozone standard (VCAPCD 2017b). Building on previous Ventura County AQMPs, the 2016 AQMP presents a combined local and State clean air strategy based on concurrent ROC and NO_x emission reductions to bring Ventura County into attainment of the 2008 Federal 8-hour ozone standard. ROC and NO_x emitted by both anthropogenic and natural sources react in the atmosphere to produce photochemical smog. Ventura County was the first area in the nation to institute such a dual-emissions strategy for meeting ozone standards.

The 2016 AQMP control strategy consists of a local component implemented by the VCAPCD and a combined State and Federal component implemented by the CARB and the USEPA. The local strategy includes emission control measures carried forward from previous Ventura County clean air plans plus new and further study emission control measures. It also includes a transportation conformity budget that sets the maximum amount of on-road motor vehicle emissions produced while continuing to demonstrate progress towards attainment.

5.4.2.3.2 VCAPCD Rules

Each rule is designed to reduce air pollution from a specific source category within Ventura County. VCAPCD rules that may be relevant to the Project are as follows:

- > VCAPCD Rule 50 – Opacity. This rule prohibits discharge of air contaminants or other material, which are as dark or darker in shade as that designated No. 1 on the Ringelmann Chart or obscure an observer's view.
- > VCAPCD Rule 51 – Nuisance. This rule prohibits discharge of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or that endanger the comfort, repose, health, or safety of any such persons or the public; or that cause, or have a natural tendency to cause, injury or damage to business or property.
- > VCAPCD Rule 55 – Fugitive Dust. The purpose of this rule is to control the amount of PM entrained in the atmosphere from man-made sources of fugitive dust. The rule limits visible dust opacity and visible dust plumes beyond property lines, requires control of track-out onto paved roads, prohibits visible dust plumes from earth moving to extend more than 100 feet, and specifies dust control requirements for truck hauling of bulk materials.
- > VCAPCD Rule 55.1 – Paved Roads and Public Unpaved Roads. This regulation requires the owner/operator of paved public roads to remove visible roadway accumulations, provides construction requirements for new roads with average daily trips of more than 1,000, and requires that activity on public unpaved roads not cause dust plumes that would exceed 100 feet in length or violate specified opacity requirements.
- > VCAPCD Rule 74.2 – Architectural Coatings. Architectural coating Rule 74.2 limits the volatile organic compound (VOC) content of paints applied to various surfaces and applies to any construction painting operation.
- > VCAPCD Rule 74.29 – Soil Decontamination Operations. The rule specifies the allowed methods for soil decontamination. This rule, which applies to soils contaminated with gasoline, diesel fuel, or jet fuel would only apply if contaminated soils are encountered during Project construction. This rule does not apply to naturally occurring petroleum hydrocarbons.
- > VCAPCD Rules 10, 23, and 26 to 26.13 – Permitting. These rules require the permitting of stationary sources and requires new emission sources use best available control technology (BACT) to control criteria pollutant emissions and requires offsetting emissions if permitted emissions would exceed designated thresholds. Portable internal combustion engines may be used during Project construction and would require permits if they are not permitted under the CARB PERP program.

5.4.2.3.3 Ventura County Air Quality Assessment Guidelines

The VCAQAG is an advisory document that provides a framework and uniform methods for preparing air quality evaluations for environmental documents. The VCAQAG recommend specific criteria and threshold levels for determining whether a proposed project may have a significant adverse air quality impact. The VCAQAG also provide mitigation measures to control fugitive dust, ROC, and NO_x emissions from construction and to control Valley Fever fungal spore entrainment.

5.4.2.3.4 Ventura County General Plan Goals and Policies

Although Santa Felicia Dam is located in unincorporated Ventura County, it is exempt from local permit requirements (with the exception of air quality requirements) because it is a water storage and power generation facility and regulated by a license issued by FERC under the Federal Powers Act. Therefore, the Project is not subject to the provisions of the Ventura County General Plan, which presents goals and

objectives for the County's air quality. Relevant goals from the Ventura County General Plan (Ventura County 2016) are summarized below for informational purposes only:

- > Goal 1.2.1-1. Diligently seek and promote a level of air quality that protects public health, safety, and welfare, and seek to attain and maintain the State and Federal Ambient Air Quality standards.
- > Goal 1.2.1-2. Ensure that any adverse air quality impacts, both long-term and short-term, resulting from discretionary development are mitigated the maximum extent feasible.
- > Policy 1.2.2-1. Discretionary development that is inconsistent with the AQMP shall be prohibited, unless overriding considerations are cited by the decision-making body.
- > Policy 1.2.2-2. The air quality impacts of discretionary development shall be evaluated by use of the Guidelines for the Preparation of Air Quality Impact Analysis.
- > Policy 1.2.2-3. Discretionary development that would have a significant adverse air quality impact shall only be approved if it is conditioned with all reasonable mitigation measures to avoid, minimize or compensate (offset) for the air quality impact. Developers shall be encouraged to employ innovative methods and technologies to minimize air pollution impacts.
- > Policy 1.2.2-5. Development subject to APCD permit authority shall comply with all applicable APCD rules and permit requirements, including the use of best available control technology (BACT) as determined by the APCD.

5.4.3 Impacts and Mitigation Measures

5.4.3.1 *Significance Criteria*

UWCD reviewed Appendix G of the CEQA Guidelines to determine whether the Project would result in significant impacts related to air quality. The criteria listed below consider if the Project would:

- a. Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
- b. Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors).
- c. Expose sensitive receptors to substantial pollutant concentrations.
- d. Create objectionable odors affecting a substantial number of people.
- e. Conflict with or obstruct implementation of the applicable air quality plan.

The primary objective of the Ventura County AQMP is to provide continuous air pollutant emission reductions over time, with the goal of attaining the Federal and State standards for ozone. According to the VCAQAG, project consistency with the AQMP can be determined by comparing the actual population growth in the county with the projected growth rates used in the AQMP. The Project would not result in any increase in population (refer to Section 5.14, Population and Housing); thus, the Project would not conflict with or obstruct implementation of the AQMP. Therefore, no impacts would occur with regard to significance criterion e, and it is not discussed further.

5.4.3.2 Proposed Project

Impact AQ-1: The Project's ozone precursor emissions would not contribute substantially to an existing air quality violation (Construction – significant but mitigable to less than significant, Operation – no impact).

Construction

Construction would result in a temporary increase in criteria pollutant emissions from engine exhaust during on-road vehicle and truck trips and off-road construction equipment operations, and fugitive dust during earthmoving activities. Primary criteria pollutants emitted during construction projects are NO_x, ROC, PM₁₀, and PM_{2.5}. Construction-related ozone precursor (ROC and NO_x) emissions were quantified using the California Emissions Estimator Model (CalEEMod) Version 2016.3.1, as recommended by the VCAPCD. This model uses widely accepted methodologies and data to quantify emissions estimates that include the: (1) USEPA AP-42 Emissions Factors, (2) CARB OFFROAD2011 emissions factors for off-road equipment and, (3) EMFAC2014 emissions factors for on-road vehicles. Emissions rates and quantification of the maximum daily ROC and NO_x emissions for the Project were generated using: the Project's specific location information; the estimated construction schedule; construction equipment list, including vehicle quantity and duration of use; and, vehicle and truck trip counts for each of the alternatives (GEI 2017b, c, Catalyst 2018a). As specified in the GEI Constructability Analysis (GEI 2017b, c), the spillway modifications are planned to be constructed after the new outlet works facilities are in operation, and, therefore, the construction activities for the options would not occur concurrently. Generally, construction activities for the outlet works component is expected to occur in the late summer and take about two years to complete followed by construction of the spillway component which is expected to take another two years for a total of four years of construction. As a result, the estimated emissions for each of the options were separately quantified and do not require the emissions from the options to be summed.

The VCAPCD has established quantitative significance criteria thresholds for ozone precursors, ROC and NO_x, of 25 pounds per day each in the Project area (VCAPCD 2003). However, construction-related emissions of these ozone precursors are not counted towards the significance thresholds because they are temporary. Table 5.4-4 summarizes the estimated maximum daily ROC and NO_x emissions from the Project's construction-related activities for each of the outlet works (i.e., sloping intake and intake tower) and spillway (i.e., spillway widening and spillway deepening) design options. The VCAPCD has not established significance thresholds for construction-related emissions of ROC and NO_x. Nonetheless, the VCAPCD has recommended mitigation for such impacts as incorporated into this EIR as MM AQ-1. Implementation of MM AQ-1 would minimize daily emissions from equipment during construction; therefore, the impact is classified as significant but mitigable to less than significant.

Table 5.4-4 Estimated Maximum Daily Construction Emissions

Project Construction Option	ROC (lbs/day)	NO_x (lbs/day)
Outlet Works with Sloping Intake Structure	8.91	89.37
Outlet Works with Intake Tower	8.89	88.71
Spillway Widening Option	4.63	39.60
Spillway Deepening Option	4.05	34.14

Source: CalEEMod Emissions Summary Reports in Appendix A. The higher emissions value of the winter and summer reports generated from CalEEMod for each of the options were used in this table.

Operation

No long-term impacts on air quality relative to Impact AQ-1 would occur due to Project operation and maintenance because they would remain unchanged from current conditions.

Mitigation Measures

MM AQ-1: Implement ROC and NO_x Construction Mitigation Measures

The following measures will be implemented during construction:

1. Minimize equipment idling time in accordance with the Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling (Title 13, Division 3, Chapter 10, Section 2435).
2. Maintain equipment engines in good condition and in proper tune as per manufacturers' specifications.
3. Lengthen the construction period during smog season (May through October), to minimize the number of vehicles and equipment operating at the same time.
4. Use alternatively fueled construction equipment, such as compressed natural gas, liquefied natural gas, or electric, if feasible.

Residual Impacts

Implementation of MM AQ-1 would ensure that residual impacts from ROC and NO_x emissions during construction would be less than significant by minimizing emissions during construction of the Project.

Impact AQ-2: The Project's PM₁₀ emissions would not contribute substantially to an existing air quality violation (Construction - significant impact but mitigable to less than significant, Operation – no impact).

Construction

The VCAPCD (2003) notes that a project will have a significant adverse air quality impact if it may be reasonably expected to generate fugitive dust emissions in such quantities as to cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which may endanger the comfort, repose, health, or safety of any such person or the public, or which may cause, or have a natural tendency to cause, injury or damage to business or property.

The VCAPCD (2003) recommends the implementation of fugitive dust mitigation measures during all project-related dust generating activities rather than quantifying fugitive dust (PM₁₀ and PM_{2.5}) emissions. Although not calculated, construction activities associated with the Project could potentially generate substantial volumes of fugitive dust during earth-moving activities, such as excavating an estimated 72,000 cubic yards of material from the adjacent slope to facilitate the widened channel as part of the option to widen the spillway chute, drilling and blasting associated with the option to lower the spillway chute, and grading associated with realigning access roads. The Project would be required to comply with VCAPCD Rule 55 – Fugitive Dust, which is intended to control the amount of PM entrained in the atmosphere from man-made sources of fugitive dust. The rule limits visible dust opacity and visible dust plumes beyond property lines, requires control of track-out onto paved roads, prohibits visible dust plumes from earth moving to extend more than 100 feet, and specifies dust control requirements for truck hauling of bulk materials. Compliance with Rule 55 is incorporated as MM AQ-2. Implementation of MM AQ-2 would minimize and suppress fugitive dust emissions during construction. As such, fugitive dust emissions resulting from construction activities are considered significant but mitigable to less than significant.

Operation

No long-term impacts to air quality relative to Impact AQ-2 would occur during operations and maintenance because operations and maintenance would remain unchanged from current conditions.

Mitigation Measures

MM AQ-2: Prepare and implement a fugitive dust control plan. The following measures shall be included in the plan and implemented during construction to control fugitive dust emissions and minimize potential risks associated with Valley Fever:

1. The area disturbed by clearing, grading, earth moving, or excavation operations shall be minimized to prevent excessive amounts of dust.
2. Pre-grading/excavation activities shall include watering the area to be graded or excavated before commencement of grading or excavation operations. Application of water (preferably reclaimed, if available) should penetrate sufficiently to minimize fugitive dust during grading activities.
3. Fugitive dust produced during grading, excavation, and construction activities shall be controlled by the following activities:
 - a. All trucks shall be required to cover their loads as required by California Vehicle Code Section 23114.
 - b. All graded and excavated material, exposed soil areas, and active portions of the construction site, including unpaved on-site roadways, shall be treated to prevent fugitive dust. Treatment shall include, but not necessarily be limited to, periodic watering, application of environmentally safe soil stabilization materials, and/or roll-compaction as appropriate. Watering shall be done as often as necessary and reclaimed water shall be used whenever possible.
4. Graded and/or excavated inactive areas of the construction site shall be monitored by (indicate by whom) at least weekly for dust stabilization. Soil stabilization methods, such as water and roll-compaction, and environmentally safe dust control materials, shall be periodically applied to portions of the construction site that are inactive for over four days. If no further grading or excavation operations are planned for the area, the area shall be seeded and watered until grass growth is evident, or periodically treated with environmentally safe dust suppressants, to prevent excessive fugitive dust.
5. Signs shall be posted on-site limiting traffic to 15 miles per hour or less.
6. During periods of high winds (i.e., wind speed sufficient to cause fugitive dust to impact adjacent properties), all clearing, grading, earth moving, and excavation operations shall be curtailed to the degree necessary to prevent fugitive dust created by on-site activities and operations from being a nuisance or hazard, either off-site or on-site. The site superintendent/supervisor shall use his/her discretion in conjunction with the APCD in determining when winds are excessive.
7. Adjacent paved streets and roads at Project site entrances and exits shall be swept at least once per day, preferably at the end of the day, if visible soil material is carried over to adjacent streets and roads.
8. Personnel involved in grading operations, including contractors and subcontractors, shall be advised to wear respiratory protection in accordance with California Division of Occupational Safety and Health regulations.
9. Signs displaying the APCD Complaint Line Telephone Number (805) 654-2797 for public complaints shall be posted in a prominent location onsite but clearly visible to the public off the site.

Residual Impacts

Implementation of MM AQ-2 would reduce the temporary fugitive dust emissions in a manner that complies with VCAPCD requirements as well as minimize potential risks associated with Valley Fever. Implementation of the fugitive dust control plan described in MM AQ-2 would reduce potential dust emissions and ensure that residual impacts from fugitive dust emissions would be less than significant.

Impact AQ-3: The Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment (Construction - less than significant impact, Operation – no impact).

Construction

As shown in Table 5.4-3, Ventura County is in non-attainment for Federal and State ozone standards and the State PM₁₀ standard. Therefore, this analysis primarily considers ozone precursors (NO_x and ROC) and PM₁₀ emissions. As noted above, the VCAQAG indicates that construction-related emissions of the ozone precursors, ROC and NO_x, are not counted towards the 25 pounds per day significance threshold that the VCAPCD has determined will individually and cumulatively jeopardize attainment of the Federal 1-hour ozone standard, and thus would not have a significant adverse impact on air quality in Ventura County because these emissions are temporary.

The VCAQAG also notes that a project that is determined to be inconsistent with the AQMP would have a significant cumulative adverse air quality impact. The Project would not conflict with or obstruct implementation of the Ventura County AQMP and would not result in long-term increases in criteria pollutant emissions. Accordingly, the Project's incremental contribution to criteria pollutant emissions is not cumulatively considerable; therefore, cumulative impacts of Project construction on criteria air pollutants would be less than significant.

Operation

No impacts on air quality relative to Impact AQ-3 would occur during operations and maintenance because operations and maintenance would remain unchanged from current conditions.

Impact AQ-4: The Project would not expose sensitive receptors to substantial pollutant concentrations (Construction - less than significant impact, Operation – no impact).

Construction

The Project area is characteristically remote and in a scarcely populated area. The nearest potential sensitive receptor to the Project area is a residence approximately 0.5 mile to the southwest, along Piru Canyon Road. Recreationists at Lake Piru Recreation Area would only be present for a matter of hours at a time and therefore, any exposure to criteria pollutants would be temporary. Because all construction activities would be short-term compared to long-term exposure criteria (70 years), no significant exposures (i.e., defined in the AQMP as exposure for at least 14 percent of one's lifetime) to diesel engine exhaust or fugitive dust would occur. Due to these factors, the Project would not expose sensitive receptors to substantial pollutant concentrations. Impacts would be less than significant.

Operation

No impacts on air quality relative to Impact AQ-4 would occur during operations and maintenance because operations and maintenance would remain unchanged from current conditions.

Impact AQ-5: The Project would not create objectionable odors affecting a substantial number of people (Construction - less-than-significant impact, Operation – no impact).

Construction

Diesel fuel would be used in trucks and construction equipment. California ultralow sulfur diesel fuel with a maximum sulfur content of 15 ppm by weight would be required to be used in all diesel-powered equipment, which would minimize emissions of sulfurous gases (SO₂, hydrogen sulfide, carbon disulfide, and carbonyl sulfide) and, thus, would minimize odors. Additionally, any odors emitted during construction would be temporary and localized. Therefore, Project impacts would be less than significant.

Operation

No impacts on air quality would occur during operations and maintenance because operations and maintenance would remain unchanged from current conditions.

5.4.3.3 Labyrinth Alternative

Potential impacts associated with construction of the Labyrinth Alternative would be similar to those of the Project. The estimated maximum daily ROC and NO_x emissions from the construction-related activities of the Labyrinth Alternative are identified in Table 5.4-5. The estimated maximum emissions generated from the Labyrinth Spillway Deepening Option are analogous to the estimated emissions from the proposed Project options. Labyrinth Alternative Spillway Widening Option maximum daily emissions estimates are higher than the other spillway options due to a combination of overlaps between construction phases and an increase in on-road trips to construct the weir. Nonetheless, given that a majority of the construction details and methods between the Labyrinth Alternative and the options of the proposed Project are similar, and that the estimated emissions for both are still temporary, the significance determinations described for the proposed Project also apply to the Labyrinth Alternative.

Table 5.4-5 Labyrinth Alternative Estimated Maximum Daily Construction Emissions -

Project Construction Option	ROC (lbs/day)	NO_x (lbs/day)
Outlet Works with Sloping Intake Structure ()	8.91	89.37
Outlet Works with Intake Tower	8.89	88.71
Spillway Widening Option	5.91	51.52
Spillway Deepening Option	4.14	38.98

Source: CalEEMod Emissions Summary Reports in Appendix A. The higher emissions value of the winter and summer reports generated from CalEEMod for each of the options were used in this table.

5.4.3.4 No Project Alternative

No impacts on air quality would result from the No Project Alternative because no construction would occur, nor would any changes in operations or maintenance be implemented.

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5.5 Biological Resources

This section addresses aquatic and terrestrial biological resources in the Project area, which includes the Project footprint as depicted in Figure 3-1, and adjacent areas, including Lake Piru Reservoir, Piru Creek below Santa Felicia Dam, and areas immediately surrounding these waterbodies.

Table 5.5-1 summarizes the impacts of the Project and alternatives on biological resources.

Table 5.5-1 Summary of Impacts on Biological Resources

Impact	Project	Labyrinth Alternative	No Project Alternative	Mitigation Measures
Impact BIO-1: The Project would adversely affect individual special-status plant species.	Construction – S/Operation – ○	Construction – S/Operation – ○	Operation – ○	MM BIO-1: Conduct pre-construction vegetation surveys; MM BIO-2: Identify and implement BMPs
Impact BIO-2: The Project would cause a temporary disturbance or permanent loss of riparian and other sensitive native plant communities.	Construction – S/Operation – ○	Construction – S/Operation – ○	Operation – ○	MM BIO-1: Conduct pre-construction vegetation surveys; MM BIO-2: Identify and implement BMPs; MM BIO-3: Prepare and implement vegetation restoration plan; MM BIO-4: Design and construct a geomorphically stable channel
Impact BIO-3: The Project would result in temporary disturbance to terrestrial special-status, migratory, and nesting birds.	Construction – S/Operation – ○	Construction – S/Operation – ○	Operation – ○	MM BIO-1: Conduct pre-construction vegetation surveys; MM BIO-2: Identify and implement BMPs; MM BIO-3: Prepare and implement vegetation restoration plan; MM BIO-4: Design and construct a geomorphically stable channel; MM BIO-5: Implement nesting bird protections
Impact BIO-4: The Project would result in temporary disturbance to special-status mammals.	Construction – L/Operation – ○	Construction – L/Operation – ○	Operation – ○	None required.
Impact BIO-5: The Project would result in disturbance to special-status amphibians and reptiles.	Construction – S/Operation – ○	Construction – S/Operation – ○	Operation – ○	MM BIO-2: Identify and implement BMPs; MM BIO-3: Prepare and implement vegetation restoration plan; MM BIO-4: Design and construct a geomorphically stable channel;

				MM BIO-6: Conduct pre-construction amphibian and reptile surveys; MM BIO-7: Species relocation during lower Piru Creek dewatering
Impact BIO-6: Project relocation of the outlet works would impact special-status fish species and their critical habitat.	Construction – S/Operation - O	Construction – L/Operation - O	Operation - O	MM BIO-4: Design and construct a geomorphically stable channel; MM BIO-8: Fish relocation during lower Piru Creek dewatering
Impact BIO-7: Project relocation of the outlet works would affect special-status fish species due to impaired water quality.	Construction – S/Operation - O	Construction – S/Operation - O	Operation - O	MM BIO-9: Implement turbidity controls
Impact BIO-8: Project construction would impact jurisdictional wetland and waters resources.	Construction – S/Operation - O	Construction – S/Operation - O	Operation - O	MM BIO-4: Design and construct a geomorphically stable channel
Impact BIO-9: The Project would temporarily disturb wildlife movement and nursery sites.	Construction – L/Operation - O	Construction – L/Operation - O	Operation - O	None required
Impact BIO-10: The Project would be consistent with local policies and ordinances protecting biological resources.	Construction – L/Operation - O	Construction – L/Operation - O	Operation - O	None required
The Project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or State habitat conservation plan.	Construction – O/Operation - O	Construction – O/Operation - O	Operation - O	None required

Notes:

- O = No Impact
- L = Less than Significant Impact
- S = Significant Impact, but Mitigable to Less than Significant
- U = Significant Unavoidable Impact
- B = Beneficial Impact

5.5.1 Methodology

The following is a description of the methods used in preparing this section, including literature review and field survey methods.

5.5.1.1 Database and Literature Review

Multiple biological studies have been completed in the Project area in support of FERC relicensing and compliance monitoring at Santa Felicia Dam. A review was conducted of relevant literature and databases to identify potential special-status species and habitats that may be present in the Project area (within the construction/operation footprint of the Project) or within 5 to 10 miles of the construction area

(Project vicinity). A list of target special-status species with the potential to occur was created from the literature search based on regional distribution, historical occurrences, and habitat requirements. Relevant literature included the following:

- > California Natural Diversity Database (CNDDDB) (CDFW 2017a)
- > California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (CNPS 2017)
- > USFWS Information for Planning and Consultation (IPaC) (USFWS 2017a)
- > USFWS Critical Habitat Portal (USFWS 2017b)
- > Santa Felicia Project (FERC No. 2153) FERC license (FERC 2008), Exhibit E documents, Final Environmental Assessment (FERC 2007) and associated biological survey reports, including:
 - o Section 3.3, Report on Botanical Resources (UWCD 2004a)
 - o Section 3.2, Report on Wildlife Resources (UWCD 2004b)
 - o Section 3.1, Report on Aquatic Resources (UWCD 2004c)
 - o Final Biological Opinion for the Issuance of a New License to United Water Conservation District for Operations of the Santa Felicia Hydroelectric Project FERC Project No. 2153-012. May 5, 2008 (NMFS 2008)
 - o Special-status Amphibian and Reptile Survey Report (Sandburg 2004)
 - o Special-Status Avian Survey Report (Greaves 2004)
- > Resource protection plans and annual monitoring compliance reports prepared for the Santa Felicia Project, including:
 - o 2016 Annual Vegetation and Noxious Weed Management Report (UWCD 2016a)
 - o 5-Year Update to Noxious Weed Baseline Inventory (BRC 2016)
 - o Arroyo Toad Protection Plan (UWCD 2009b)
 - o Revised Lower Piru Creek Herpetological Monitoring Plan (UWCD 2012b)
 - o Santa Felicia Water Release Plan for Santa Felicia Project (FERC Project No. 2153) (UWCD 2012a)
 - o 2012 Combined Annual Report for Revised Herpetological Monitoring and Arroyo Toad Protection Plans for Santa Felicia Project (FERC Project No. 2153) (UWCD 2012c)
 - o 2013 Combined Annual Report for Revised Herpetological Monitoring and Arroyo Toad Protection Plans for Santa Felicia Project (FERC Project No. 2153) (UWCD 2013)
 - o 2014 Combined Annual Report for Revised Herpetological Monitoring and Arroyo Toad Protection Plans for Santa Felicia Project (FERC Project No. 2153) (UWCD 2014)
 - o 2015 Combined Annual Report for Revised Herpetological Monitoring and Arroyo Toad Protection Plans for Santa Felicia Project (FERC Project No. 2153) (UWCD 2015a)
 - o 2016 Combined Annual Report for Revised Herpetological Monitoring and Arroyo Toad Protection Plans for Santa Felicia Project (FERC Project No. 2153) (UWCD 2016b)
 - o The Status of the Least Bell's Vireo and Four Other Riparian Bird Species at United Water Conservation District, Saticoy and Piru, California in 2016 (Griffith Wildlife Biology 2016)
 - o Piru Creek Snorkel Survey Results – August 4, 2015 (UWCD 2015b)
 - o Piru Creek Snorkel Survey Results – October 20, 2016 (UWCD 2016c)
- > Relevant State and Federal listing packages and maintained species lists (CDFW 2017b-e)
- > Ventura County General Plan (Ventura County 2016a; Piru Area Plan (Ventura County 2011))
- > Ventura County lists of Locally Important Plants and Animals (Ventura County 2014a, 2014b)

Special-status Species Lists. Various databases and online resources were investigated to develop a list of potentially occurring special-status plant and wildlife species. For the purposes of this EIR, “special-status” species include the following:

- > Federally listed as endangered (FE), threatened (FT), proposed (FP), or candidate (FC) under the Federal Endangered Species Act;
- > State-listed as endangered (SE), threatened (ST), proposed (SP), or candidate (SC) under the California Endangered Species Act;
- > CNPS California Rare Plant Rank (CRPR) 1B, 2, 3 and 4;
- > California Species of Special Concern (CSSC); and
- > California fully protected (CFP) species.

The CNPS Inventory database queries included the Piru Creek 7.5-minute quadrangle, as well as the surrounding eight quadrangles of Devils Heart Peak, Cobblestone Mountain, Whitaker Peak, Fillmore, Val Verde, Moorpark, Simi Valley and Santa Susana. Additionally, the CNDDDB query included three quadrangles to the east: Warm Spring Mtn., Newhall, and Oat Mtn.

Online IPaC resources provided by the USFWS Sacramento District included a query of the entire Project area. The species list that was generated included Federally listed species, critical habitat, and other Federally recognized resources including wetlands and migratory birds (USFWS 2017a). The list was used to cross-reference and/or supplement the target special-status species list.

All species generated from the literature review were evaluated for their potential to occur within the Project area or within the Project vicinity (within 5 to 10 miles of the Project) using the following rankings:

- > **NONE** – Species have no potential to occur in the Project area or its vicinity due to the lack of suitable habitat, or the Project area is outside of the species’ known or historical range.
- > **LOW** –The elevation or habitat requirements for this species are not met in the Project area (i.e., no suitable habitat exists), and/or the species has a very specific and limited distribution but known occurrences have been recorded and/or appropriate habitat for the species is available within the vicinity of the Project. No recent historical records for the species occur within the Project area or vicinity, and any habitat or specific environmental conditions needed to support the species do not exist or are of poor quality.
- > **MODERATE** – There are known historic occurrences in the Project area and/or direct vicinity (<5 miles), and preferred habitat conditions are present in the Project vicinity; however, only poor-quality habitat occurs within the immediate Project area.
- > **HIGH** – Species are known to occur in the Project area (recent or current recorded occurrences), and their preferred habitat conditions are present in the Project area.
- > **KNOWN** – The species has been observed within the Project area during protocol level surveys or during other incidental surveys conducted in the Project area.

Table 5.5-2 shows the listing status of the special-status species; their potential to occur in the Project area based on habitat range and needs, environmental conditions, and observations in the area; and if they have designated critical habitat within five miles of the Project area. Special-status species known to occur as well as those with high or moderate potential to occur within the Project area have been carried through for the evaluation of potential impacts from the Project and alternatives (Section 5.5.3). Of the 45 special-status plant species, one, slender mariposa lily, is known to occur in the Project area; nine have a high potential to occur; ten have a moderate potential to occur; and the remaining have low or no potential to occur. Of the 38 special-status terrestrial and aquatic species, ten are known to occur in the Project area; three have a high potential to occur; 11 have a moderate potential to occur; and, the

remaining species have low or no potential to occur. See Appendix B Tables 1 and 2 for a more detailed description of species' habitats and explanation of the potential to occur in the area.

Table 5.5-2 Special-status species and their Potential to Occur in the Project Area

Scientific Name	Common Name	Listing Status	Potential to Occur in the Project Area	Critical Habitat
Vegetation				
<i>Calochortus clavatus</i> var. <i>gracilis</i>	Slender mariposa lily	CRPR 1B.2	KNOWN (BRC 2016)	No
<i>Calochortus catalinae</i>	Catalina mariposa lily	CRPR 4.2	HIGH	No
<i>Calochortus clavatus</i> var. <i>clavatus</i>	Club-haired mariposa lily	CRPR 4.3	HIGH	No
<i>Calochortus plummerae</i>	Plummer's mariposa lily	CRPR 4.2	HIGH	No
<i>Calystegia peirsonii</i>	Peirson's morning-glory	CRPR 4.2	HIGH	No
<i>Deinandra paniculata</i>	Paniculate tarplant	CRPR 4.2	HIGH	No
<i>Horkelia cuneata</i> var. <i>puberula</i>	Mesa horkelia	CRPR 1B.1	HIGH	No
<i>Juglans californica</i>	Southern California black walnut	CRPR 4.2	HIGH	No
<i>Juncus acutus</i> ssp. <i>leopoldii</i>	Southwestern spiny rush	CRPR 4.2	HIGH	No
<i>Pseudognaphalium leucocephalum</i>	White rabbit-tobacco	CRPR 2B.2	HIGH	No
<i>Acanthoscyphus parishii</i> var. <i>parishii</i>	Parish's oxytheca	CRPR 4.2	MODERATE	No
<i>Chorizanthe parryi</i> var. <i>fernandina</i>	San Fernando Valley spineflower	SE/ CRPR 1B.1	MODERATE	No
<i>Dodecahema leptoceras</i>	Slender-horned spineflower	FE/SE/ CRPR 1B.1	MODERATE	No
<i>Lupinus paynei</i>	Payne's bush lupine	CRPR 3.1	MODERATE	No
<i>Monardella linoides</i> ssp. <i>oblonga</i>	Tehachapi monardella	CRPR 1B.3	MODERATE	No
<i>Navarretia ojaiensis</i>	Ojai navarretia	CRPR 1B.1	MODERATE	No
<i>Orcuttia californica</i>	California Orcutt grass	FE/SE/ CRPR 1B.1	MODERATE	No
<i>Pentachaeta lyonii</i>	Lyon's pentachaeta	FE/SE/ CRPR 1B.1	MODERATE	No
<i>Phacelia hubbyi</i>	Hubby's phacelia	CRPR 4.2	MODERATE	No
<i>Senecio aphanactis</i>	Chaparral ragwort	CRPR 2B.2	MODERATE	No
<i>Acanthoscyphus</i> (= <i>Oxytheca</i>) <i>parishii</i> var. <i>abramsii</i>	Abrams' oxytheca	CRPR 1B.2	LOW	No
<i>Calochortus fimbriatus</i>	Late-flowered mariposa lily	CRPR 1B.3	LOW	No
<i>Castilleja gleasonii</i>	Mt. Gleason paintbrush	SR/ CRPR 1B.2	LOW	No

Scientific Name	Common Name	Listing Status	Potential to Occur in the Project Area	Critical Habitat
<i>Cercocarpus betuloides</i> var. <i>blancheae</i>	Island mountain-mahogany	CRPR 4.3	LOW	No
<i>Clarkia exilis</i>	Slender clarkia	CRPR 4.3	LOW	No
<i>Clinopodium mimuloides</i>	Monkey-flower savory	CRPR 4.2	LOW	No
<i>Convolvulus simulans</i>	Small-flowered morning-glory	CRPR 4.2	LOW	No
<i>Deinandra minthornii</i>	Santa Susana tarplant	SR/ CRPR 1B.2	LOW	No
<i>Delphinium parryi</i> ssp. <i>purpureum</i>	Mt. Pinos larkspur	CRPR 4.3	LOW	No
<i>Delphinium umbracolorum</i>	umbrella larkspur	CRPR 1B.3	LOW	No
<i>Dudleya parva</i>	Conejo dudleya	FT/ CRPR 1B.2	LOW	No
<i>Arenaria paludicola</i>	Marsh sandwort	FE/ CRPR 1B.1	LOW	No
<i>Berberis nevinii</i>	Nevin's barberry	FE/SE/ CRPR 1B.1	LOW	No
<i>Galium grande</i>	San Gabriel bedstraw	CRPR 1B.2	LOW	No
<i>Harpagonella palmeri</i>	Palmer's grapplinghook	CRPR 4.2	LOW	No
<i>Helianthus inexpectatus</i>	Newhall sunflower	CRPR 1B.1	LOW	No
<i>Helianthus nuttallii</i> ssp. <i>parishii</i>	Los Angeles sunflower	CRPR 1A	LOW	No
<i>Hordeum intercedens</i>	<u>Bobtail</u> barley	CRPR 3.2	LOW	No
<i>Lepechinia rossii</i>	Ross' pitcher sage	CRPR 1B.2	LOW	No
<i>Monardella sinuata</i> ssp. <i>gerryi</i>	Gerry's curly-leaved monardella	CRPR 1B.1	LOW	No
<i>Nasturtium (=Rorippa) gambelii</i>	Gambel's watercress	FE	LOW	No
<i>Navarretia fossalis</i>	Spreading navarretia	FT/ CRPR 1B.1	LOW	No
<i>Opuntia basilaris</i> var. <i>brachyclada</i>	Short-joint beavertail	CRPR 1B.2	LOW	No
<i>Stylocline masonii</i>	Mason's neststraw	CRPR 1B.1	LOW	No
<i>Symphotrichum greatae</i>	Greata's aster	CRPR 1B.3	LOW	No
Invertebrates				
<i>Streptocephalus woottoni</i>	Riverside fairy shrimp	FE	NONE	No
<i>Branchinecta lynchi</i>	Vernal pool fairy shrimp	FT	NONE	No

Scientific Name	Common Name	Listing Status	Potential to Occur in the Project Area	Critical Habitat
Birds				
<i>Icteria virens</i>	Yellow-breasted chat	CSSC	KNOWN (Greaves 2004, Griffith 2016)	No
<i>Setophaga petechia</i>	Yellow warbler	CSSC	KNOWN (Griffith 2016)	No
<i>Vireo bellii pusillus</i>	Least Bell's vireo	FE/SE	KNOWN (Griffith 2016)	Yes
<i>Empidonax traillii extimus</i>	Southwestern willow flycatcher	FE/SE	HIGH	Yes
<i>Gymnogyps californianus</i>	California condor	FE/SE/CFP	HIGH	Yes
<i>Lanius ludovicianus</i>	Loggerhead shrike	CSSC	HIGH	No
<i>Athene cunicularia</i>	Burrowing owl	CSSC	MODERATE	No
<i>Polioptila californica californica</i>	Coastal California gnatcatcher	FT/CSSC	MODERATE	No
<i>Elanus leucurus</i>	White-tailed kite	CFP	MODERATE	No
<i>Buteo swainsoni</i>	Swainson's hawk	ST	LOW	No
<i>Ammodramus savannarum</i>	Grasshopper sparrow	CSSC	LOW	No
<i>Coccyzus americanus occidentalis</i>	Western yellow-billed cuckoo	FT/SE	LOW	No
<i>Riparia riparia</i>	Bank swallow	ST	LOW	No
Mammals				
<i>Antrozous pallidus</i>	Pallid bat	CSSC	MODERATE	No
<i>Eumops perotis californicus</i>	Western mastiff bat	CSSC	MODERATE	No
<i>Lepus californicus bennettii</i>	San Diego black-tailed jackrabbit	CSSC	MODERATE	No
<i>Neotoma lepida intermedia</i>	San Diego desert woodrat	CSSC	MODERATE	No
<i>Taxidea taxus</i>	American badger	CSSC	MODERATE	No
<i>Euderma maculatum</i>	Spotted bat	CSSC	LOW	No
<i>Macrotus californicus</i>	California leaf-nosed bat	CSSC	LOW	No
Amphibians and Reptiles				
<i>Aspidoscelis tigris stejnegeri</i>	Coastal whiptail (=San Diego tiger whiptail)	CSSC	KNOWN (Greaves 2004)	No
<i>Emys marmorata (=Actinemys pallida)</i>	Western pond turtle (=Southern western pond turtle)	CSSC	KNOWN (UWCD 2004b)	No
<i>Phrynosoma blainvillii</i>	Blainville's horned lizard	CSSC	KNOWN (Greaves 2004)	No
<i>Thamnophis hammondi</i>	Two-striped gartersnake	CSSC	KNOWN (UWCD 2004b)	No

Scientific Name	Common Name	Listing Status	Potential to Occur in the Project Area	Critical Habitat
<i>Spea hammondi</i>	Western spadefoot	CSSC	MODERATE	No
<i>Arizona elegans occidentalis</i>	California glossy snake	CSSC	MODERATE	No
<i>Salvadora hexalepis virgulata</i>	Coast patch-nosed snake	CSSC	MODERATE	No
<i>Anaxyrus californicus</i>	Arroyo toad	FE/CSSC	LOW	Yes
<i>Rana draytonii</i>	California red-legged frog	FT/CSSC	LOW	Yes
<i>Taricha torosa</i>	Coast Range newt	CSSC	NONE	No
<i>Rana boylei</i>	Foothill yellow-legged frog	CSSC	NONE	No
Fish				
<i>Gila orcuttii</i>	Arroyo chub	CSSC	KNOWN (UWCD 2004c, 2015c, 2016c)	No
<i>Oncorhynchus mykiss irideus</i>	Steelhead - Southern California DPS	FE	KNOWN (UWCD 2004c, 2015c, 2016c)	Yes
<i>Catostomus santaanae</i>	Santa Ana sucker	FT	KNOWN (UWCD 2004c)	No
<i>Gasterosteus aculeatus williamsoni</i>	Unarmored threespine stickleback	FE/SE/CFP	NONE	No

Sources: CDFW 2017a, Greaves 2004, Griffith Wildlife Biology 2016, CNPS database, UWCD 2004b, 2004c, 2015c, 2016c.

LISTING STATUS CODES: FC - Federal Candidate; FE - Federal Endangered; FT - Federal Threatened; CFP - California Fully Protected; SCT - State Candidate Threatened; SE - State Endangered; ST - State Threatened; SR - State Rare; CSSC - CA Species of Special Concern

California Native Plant Society designation: List 1B - Plants rare, threatened, or endangered in California and elsewhere; List 2 – Plants rare, threatened, or endangered in California, but more common elsewhere; List 3 – Plants about which we need more information - a review list; List 4 – Plant of limited distribution – a watch list; 0.1 Seriously threatened in California (high degree/immediacy of threat); 0.2 Fairly threatened in California (moderate degree/immediacy of threats); 0.3 – Not very threatened in California (low degree/immediacy of threats or no current threats known)

Critical Habitat. GIS layers of Federally designated critical habitat were obtained from the USFWS online Critical Habitat Portal (USFWS 2017b), and critical habitat was evaluated within a five-mile buffer of the Project area. GIS layers for southern California steelhead critical habitat were obtained from the NOAA Fisheries protected resources website and specific descriptions from the Federal Register (NOAA 2005).

5.5.1.2 Field Surveys

Terrestrial

A general reconnaissance survey of the Project area was completed on April 24, 2017, by biologists with specialization in botany and terrestrial biology. Prior to the survey, the biologists reviewed the available literature to familiarize themselves with special-status species that could occur in the area.

Survey methods consisted of walking and/or driving the Project area and surveying surrounding vegetation communities and general habitat conditions from ground level. Areas that were difficult to access, such as the north and east shore of Lake Piru Reservoir, and inaccessible areas associated with the lower reaches of Piru Creek were observed from a nearby vantage point with binoculars. Vegetation communities were mapped according to classifications provided in *A Manual of California Vegetation, Second Edition* (Sawyer et al. 2009). Communities were mapped in the field with a combination of ground survey and aerial interpretation and then integrated into a GIS database.

A general assessment of wildlife habitat was conducted, including an evaluation of habitat quality for nesting birds, ground dwelling and burrowing mammals, large mammals, bats, reptiles and amphibians, and aquatic species. Habitat conditions in the Project area were compared to habitat requirements for special-status species to assist in the determination of the likelihood of each species to occur in the Project area. All incidental wildlife sightings, including signs (track, scat, etc.), were recorded.

Aquatic

Aquatic habitat in lower Piru Creek from the town of Piru to Santa Felicia Dam was mapped during the relicensing of the Santa Felicia Hydroelectric Project in 2004 and again by UWCD biologists in 2009. Presence/absence fish surveys were conducted in November 2003 at various locations in lower Piru Creek during relicensing efforts for the Santa Felicia Hydroelectric Project. These surveys were conducted by isolating habitat units with blocknets and using seine nets to collect fish and other aquatic species. Informal fish surveys have been conducted intermittently by UWCD biologists using mask and snorkel methods since 2008. Two snorkel surveys were conducted, one in 2015 and the other in 2016, in a 1,200-foot reach of lower Piru Creek extending from the Santa Felicia Dam outlet works downstream to the UWCD-Rancho Temescal property line. The surveys were used to identify and catalogue fish species presence. These surveys were conducted by UWCD biologists with expertise in identifying southern California fish species as well as other fish and aquatic species.

5.5.2 Existing Conditions

The following section presents a discussion of the literature search and field survey results. Nomenclature for plants follows the *Jepson Manual, Vascular Plant of California, Thoroughly Revised and Expanded* (Baldwin et al. 2012), and nomenclature for wildlife follows recent taxonomic changes as reflected in the most recent listing packages (CDFW 2017b-e).

5.5.2.1 Vegetation Communities

Vegetation communities were mapped in 2004 during the relicensing of the Santa Felicia Hydroelectric Project (UWCD 2004a). Community descriptions followed the *Preliminary Descriptions of Terrestrial Natural Communities of California* (Holland 1986), and the relevant parts of those descriptions are provided below. Vegetation community mapping and classification was refined and updated during recent surveys in 2017, using *A Manual of California Vegetation, Second Edition* (Sawyer et al. 2009). Vegetation communities observed within the Project area and immediate vicinity consisted of shrub-dominated sage scrub and chaparral scrublands, non-native grassland, and ruderal areas. Riparian and wetland communities were represented by woodlands, scrub, and herbaceous communities adjacent to Lake Piru Reservoir, lower Piru Creek, the lower Piru Creek release channel, and the spillway channel, and alluvial fan sage scrub dominated historically flood-prone areas outside of the riparian zone. Two unvegetated categories – bare exposed rock/open water and developed land – were also mapped.

These communities regularly intergraded throughout the Project area with chaparral and sage scrub communities dominating on hot south- and west-facing slopes, while mixed chaparral, oak woodlands, and riparian communities occupied the cooler north- and east-facing slopes and canyons and along stream corridors. Figure 5.5-1 provides a map of vegetation communities observed in the Project area. The following acreage is shown in the figure: 51.57 acres of toyon chaparral (*Heteromeles arbutifolia* Shrubland Alliance); 393.24 acres of California sagebrush-black sage scrub (*Artemisia californica-Salvia mellifera* Shrubland Alliance); 7.97 acres of California buckwheat scrub (*Eriogonum fasciculatum* Shrubland Alliance); 25.57 acres of scale broom scrub (*Lepidospartum squamatum* Shrubland Alliance); 34.21 acres of Fremont cottonwood forest (*Populus fremontii* Forest Alliance); 22.07 acres of non-native grassland; 19.42 acres of ruderal area; 52.86 acres of open water/rock; and 155.99 acres of developed land.

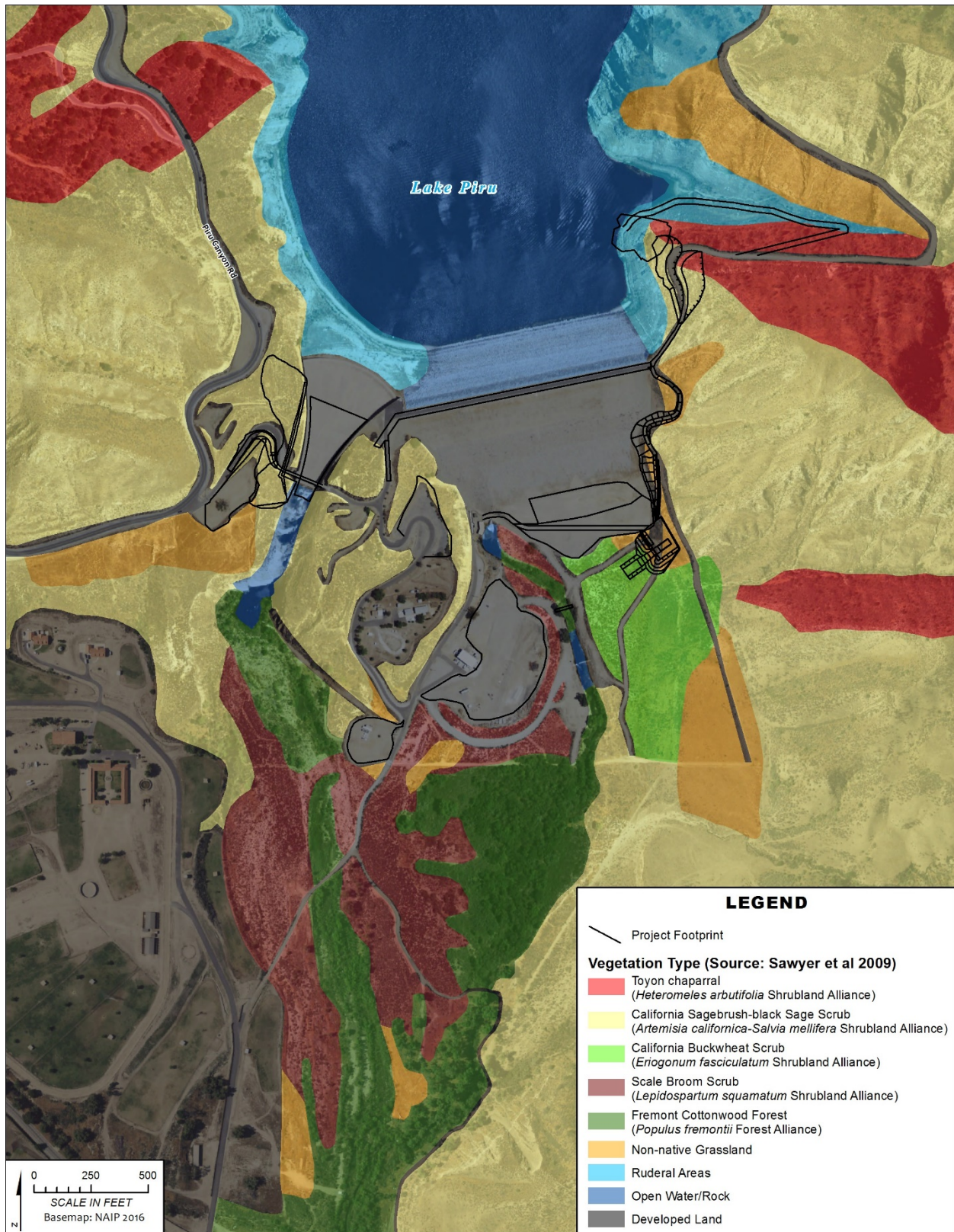


Figure 5.5-1 Vegetation Communities

Chaparral. Chaparral communities dominated steep south- and west-facing slopes where they commonly intergraded with woodland and sage scrub communities. Within the Project area, chaparral community types were mapped in the vicinity of the new proposed outlet structure. Toyon chaparral (*Heteromeles arbutifolia* Shrubland Alliance) dominated the north-facing slope adjacent to Lake Piru Reservoir. Dominant species included toyon (*Heteromeles arbutifolia*), California sagebrush (*Artemisia californica*), coyote brush (*Baccharis pilularis*), and California ash (*Fraxinus dipetala*).

Sage Scrub. Sage scrub communities are characterized by low, mostly soft-woody shrubs, 0.5-2 meters tall, with crowns usually touching, and bare ground underneath and between shrubs. Dominant plants lie dormant through summer and fall, with growth occurring in late winter and spring following the onset of winter rains. Most flowering occurs in spring, but some species (primarily members of the family Asteraceae) continue into summer. This community is adapted to fire by crown-sprouting. This cover type typically occupies drier south facing slopes and tends to intergrade with chaparral and oak woodland communities on more mesic slopes and canyons (Holland 1986).

Within the Project area and vicinity, Venturan sage scrub (Holland 1986) best describes the heterogeneous mix of soft-woody shrubs. According to *A Manual of California Vegetation* these areas would be classified as California sagebrush scrub (*Artemisia californica* Shrubland Alliance), black sage scrub (*Salvia mellifera* Shrubland Alliance), California sagebrush-black sage scrub (*Artemisia californica-Salvia mellifera* Shrubland Alliance), and/or California buckwheat scrub (*Eriogonum fasciculatum* Shrubland Alliance) depending on variations in dominant species cover (Sawyer et al. 2009). Two dominant communities, California sagebrush-black sage scrub and California buckwheat scrub, were mapped on most of the slopes within and surrounding the Project area. Dominant species cited in the literature and observed on site include California sagebrush, California buckwheat (*Eriogonum fasciculatum*), various sages (*Salvia apiana*, *S. mellifera*, *S. leucophylla*), bush sunflower (*Encelia californica*), deerweed (*Acmispon glaber*), bush monkey-flower (*Mimulus aurantiacus*), and chaparral yucca (*Hesperoyucca whipplei*).

Southern alluvial fan scrub (Holland 1986), also known as scale broom scrub (*Lepidospartum squamatum* Shrubland Alliance) (Sawyer et al. 2009) hosts scale broom (*Lepidospartum squamatum*), an open to moderately dense, broad-leaved phreatophyte evergreen scrub that attains a height of about three to five feet. Membership rules include >1 percent cover by scale broom, which is primarily restricted to floodplain habitats but is not considered a wetland indicator (Sawyer et al. 2009). Alluvial fan scrub/SBS is primarily restricted to floodplain habitats containing riverine cobbles, boulders, and sand. These areas apparently flood only occasionally (i.e., 5 to 10 years); therefore, many upland species become established in the streamside habitat. Within the Project area and vicinity, common subdominant shrub species included a heterogeneous mix of coastal sage scrub, chaparral, and riparian species, including California buckwheat, California sagebrush, chaparral yucca, yerba santa (*Eriodictyon crassifolium*), mulefat (*Baccharis salicifolia*), blue elderberry (*Sambucus nigra* ssp. *caerulea*), and Fremont cottonwood (*Populus fremontii* ssp. *fremontii*) (Sawyer et al. 2009). The open understory areas were dominated by grasses and ruderal herbaceous species (native and non-native).

Grasslands. Non-native grasses are present in the Project area and vicinity near developed areas including roads and dam facilities. Prevalence of non-native vegetation in these areas is likely due to disturbance during the original construction of Santa Felicia Dam and the placement of fill material (see Figure 2-5). Areas dominated by grassland and/or mustard would be classified as upland mustards (Other Mustards Semi-Natural Herbaceous Stands) and/or annual brome grasslands (*Bromus (diandrus, hordeaceus)-Brachypodium distachyon* Semi-Natural Herbaceous Stands) (Sawyer et al. 2009). Dominant species observed included summer mustard (*Hirschfeldia incana*), various species of brome grass (*Bromus* spp.), wild oat (*Avena fatua*), and rattail fescue (*Festuca myuros*). These areas were mapped as non-native grasslands.

Riparian and Wetland Areas. Within the Project area and vicinity, riparian and wetland areas were identified adjacent to Lake Piru Reservoir, lower Piru Creek, lower Piru Creek release channel, and the spillway channel and ponds. One additional drainage was identified at the northern-most end of the Project area in the vicinity of the proposed new outlet works; however, the channel was highly ephemeral and did not host a riparian community.

The dominant riparian community in the Project area was Fremont cottonwood forest (*Populus fremontii* Forest Alliance) (Sawyer et al. 2009), also described as southern cottonwood willow riparian forest (Holland 1986). Fremont cottonwood forest is a tall, open, broadleaved winter-deciduous woodland dominated by an overstory of Fremont cottonwood and various tree willows (*Salix* sp.) and an understory of shrubby willows. Other common species described in the literature and found in the Project area include coast live oak (*Quercus agrifolia*), white alder (*Alnus rhombifolia*), California sycamore (*Platanus racemosa*), mugwort (*Artemisia douglasiana*), mulefat, Cucamonga manroot (*Marah macrocarpus*), and nettles (*Urtica* sp.). This cover type is commonly distributed on floodplains, low-gradient rivers, perennial or seasonally intermittent streams, and springs and alluvial fans with a dependable sub-surface water supply (Sawyer et al. 2009). The dominant species require moist, bare mineral soil for germination and establishment, which is provided after flood waters recede, leading to uniform-aged stands in this seral type. Fremont cottonwood forest is mapped along the lower reaches of Piru Creek as well as portions of the spillway channel and lower Piru Creek release channel.

Limited areas within the Project area riparian zone were dominated by a heterogeneous mix of shrubby willows and mulefat. Classified by Sawyer et al. (2009) separately as mulefat thickets (*Baccharis salicifolia* Shrubland Alliance), sandbar willow thickets (*Salix exigua* Shrubland Alliance), and/or arroyo willow thickets (*Salix lasiolepis* Shrubland Alliance), these communities intergraded consistently, and were mapped as Fremont cottonwood forest due to the presence of that species in the tree layer.

Lake Piru Reservoir and open water sections of the spillway channel and lower Piru Creek release channel were classified as "open water/rock". The upper reach of the spillway channel composed of bare rock hosting small isolated plunge pools is also included in this cover type.

Freshwater emergent wetlands dominated by cattail (*Typha* sp.) occupied shallow depths of the spillway channel, spillway pond, and small isolated patches within the wetted portion of the lower Piru Creek release channel. These areas are classified as cattail marshes (*Typha [angustifolia, domingensis, latifolia]* Herbaceous Alliance) (Sawyer et al. 2009); however, these areas were too small to warrant mapping and have been included in the open water/rock cover type.

Vegetation colonization along the exposed lakeshore below the typical inundation zone consists of a sparse to dense cover of ruderal species of both native and exotic origin. Mapped as "ruderal areas", this cover type thrives in disturbed areas, where a mix of opportunistic vegetation can colonize. The substrate in ruderal areas is frequently composed of fill dirt, rock slope protection (i.e., rip rap), or in the case of the Lake Piru Reservoir, frequently disturbed soils that are subject to prolonged periods of inundation and exposure. Vegetation in this habitat is sparse and consists primarily of annual grasses and forbs found in the adjacent sage scrub. Occasional riparian species (i.e., cattail, mulefat, and Fremont cottonwood) occupied the wetted area and/or emergent zone or perched on the lakeshore at a location associated with a past water inundation level.

Anthropogenic Areas. Developed land is a blend of urban, industrial, and rural development with low-density structural development. The majority of areas characterized as developed land in the Project area are hydroelectric facilities (i.e., Santa Felicia Dam and Santa Felicia Powerhouse), roads, parking lots, and other cleared areas maintained devoid of vegetation. Other developed areas representing rural development, including houses, barns, equipment/tank storage, and exotic plant landscaping are also mapped as "developed."

5.5.2.2 Common Terrestrial and Aquatic Wildlife Resources

Terrestrial Species. Species common in scrub communities and recorded in the Project area include western fence lizard (*Sceloporus occidentalis*), American crow (*Corvus brachyrhynchos*), red-tailed hawk (*Buteo jamaicensis*), desert cottontail (*Sylvilagus audubonii*), and mule deer (*Odocoileus hemionus*). Typical wildlife species that often breed in annual grassland habitats include fence lizard (*Sceloporus occidentalis*), gopher snake (*Pituophis catenifer*), horned lark (*Eremophila alpestris*), burrowing owl (*Athene cunicularia*), western meadowlark (*Sturnella neglecta*), black-tailed jack rabbit (*Lepus californicus*), California vole (*Microtus californicus*), American badger (*Taxidea taxus*), and coyote (*Canis latrans*). Other common species that use grassland habitats for foraging but breed elsewhere include turkey vulture (*Cathartes aura*), white-tailed kite (*Elanus leucurus*), and American kestrel (*Falco sparverius*) (UWCD 2004b).

Wildlife species recorded in wetland, riparian, or lacustrine habitat during surveys in 2004 included western grebes (*Aechmophorus occidentalis*), deer (*Odocoileus hemionus*), rabbits, and bullfrogs (*Lithobates catesbeianus*) (UWCD 2004b). Bare rock is used by nesting raptors and bank swallows (vertical sandstone cliffs) and is roosting habitat for bats (small caves) (UWCD 2004b).

Common wildlife species using developed land include gopher snake, scrub jay (*Aphelocoma californica*), northern mockingbird (*Mimus polyglottos*), house finch (*Carpodacus mexicanus*), California quail (*Callipepla californica*), bushtit (*Psaltriparus minimus*), oak titmouse (*Baeolophus inornatus*), striped skunk (*Mephitis mephitis*), Virginia opossum (*Didelphis virginianus*), and black-tailed jack rabbit (UWCD 2004b).

Fish Species. Fish species observed in lower Piru Creek during surveys conducted in 2003 included partially armored threespine stickleback (*Gasterosteus aculeatus microcephalus*)¹, Owens sucker (*Catostomus fumeiventris*), Santa Ana/Owens sucker hybrids, fathead minnow (*Pimephales promelas*), largemouth bass (*Micropterus salmoides*), and prickly sculpin (*Cottus asper*). During these surveys, partially armored threespine stickleback was the dominant fish species, comprising 90.6% of the fish fauna in lower Piru Creek at that time. In 2013, UWCD biologists observed the non-native Shimofuri goby (*Tridentiger bifasciatus*) in lower Piru Creek below Santa Felicia Dam. Fish species observed and collected in the isolated spillway channel pools consisted of non-native species including bluegill (*Lepomis macrochirus*), green sunfish (*Lepomis cyanellus*), largemouth bass, and prickly sculpin.

Fish that are known to occupy Lake Piru Reservoir or Piru Creek upstream of the reservoir include rainbow trout, partially armored threespine stickleback, Owens sucker, Santa Ana-Owens sucker hybrids, Florida-strain largemouth bass (*Micropterus salmoides floridanus*), bluegill, green sunfish, redear sunfish (*Lepomis microlophus*), black crappie (*Pomoxis nigromaculatus*), white crappie (*Pomoxis annularis*), channel catfish (*Ictalurus punctatus*), white catfish (*Ameiurus catus*), brown bullhead (*Ameiurus nebulosus*), common carp (*Cyprinus carpio*), goldfish (*Carassius auratus auratus*), prickly sculpin, threadfin shad (*Dorosoma petenense*), Shimofuri goby, and fathead minnow (UWCD 2004c, CDFW 2014).

Amphibians and Reptiles. Common amphibians in Piru Creek include California toad (*Anaxyrus boreas halophilus*), California tree frog (*Pseudacris cadaverina*), Baja California chorus frog (*Pseudacris hypochondriaca hypochondriaca*), bullfrog (*Lithobates catesbeianus*), African clawed frog (*Xenopus laevis*), and red-eared slider (*Trachemys scripta elegans*). Common amphibian and reptile species observed in the isolated spillway channel pools included the native Baja California chorus frog and non-native American bullfrog (*Rana catesbeiana*), African clawed frog, and red-eared slider (UWCD 2012c, 2013, 2014, 2015a, and 2016b).

¹ Per the American Fisheries Society Seventh Edition Common and Scientific Names of Fishes from the United States, Canada, and Mexico (2013), it is recommended nomenclature to capitalize common fish species names. However, common fish species names are not capitalized in this section to maintain consistency with terrestrial species.

5.5.2.3 *Invasive Plants and Wildlife*

Invasive plants

UWCD initially identified 14 species as target noxious weed species during surveys conducted in 2004 as part of the relicensing efforts associated with the Santa Felicia Hydroelectric Project; these surveys were conducted on Los Padres National Forest lands within the FERC boundary including exposed areas of Lake Piru Reservoir (UWCD 2004a). The following 12 species were observed within the Santa Felicia Hydroelectric Project boundary on Los Padres National Forest lands: wild oat (*Avena fatua* and *A. barbata*), black mustard (*Brassica nigra*), ripgut brome (*Bromus diandrus*), red brome (*Bromus madritensis* ssp. *rubens*), cheatgrass (*Bromus tectorum*), tocalote (*Centaurea melitensis*), yellow star thistle (*Centaurea solstitialis*), bull thistle (*Cirsium vulgare*), tree tobacco (*Nicotiana glauca*), Russian thistle (*Salsola tragus*), and tamarisk (*Tamarix* spp.). The two additional species, wild fennel (*Foeniculum vulgare*) and castor bean (*Ricinus communis*), were observed infrequently elsewhere in the Project vicinity. The findings of the 2004 survey indicated that grassland habitat in the area is dominated by exotic Mediterranean grass species that are nearly ubiquitous in lower-elevation California. UWCD does not implement practices to control these naturalized and ubiquitous species (UWCD 2004a).

In accordance with its *Vegetation and Noxious Weed Management Plan*, which was approved by FERC in 2011, UWCD implements practices to control and eradicate noxious weed species that are both listed as A, B, or Q species by the CDFA and identified as weed species of concern by the Los Padres National Forest in the *Vegetation and Noxious Weed Management Plan Area* (UWCD 2010a). Six species fit these criteria: giant reed (*Arundo donax*), hairy white top (*Cardaria pubescens*), spotted knapweed (*Centaurea maculosa*), pampas grass (*Cortaderia jubata/selloana*), scotch thistle (*Onopordum acanthium* ssp. *acanthium*), and tamarisk (*Tamarix ramosissima*). Tamarisk was the only one of these species observed in the Project area in the 2004 survey as well as annual surveys conducted from 2011-2016. During 2016 focused surveys, approximately 4,700 individual Tamarisk plants occupying approximately 12.2 total acres were identified within the Management Area, which consists of areas adjacent to Santa Felicia Dam, the area along the western shore of Lake Piru Reservoir, and the accessible portion of the eastern shore at the north end of Lake Piru Reservoir above 1,055 feet elevation (UWCD 2016a). Tamarisk is a non-native invasive tree-shrub that can grow in dense patches, out-compete native vegetation, change soil chemistry by depositing salts from deep ground water on the soil surface, and remove water from streams and riparian areas through evapotranspiration. In 2012, UWCD developed a *Strategy for Treatment and Eradication of Tamarix ramosissima* in consultation with the Los Padres National Forest to identify priority areas of infestation, eradication protocols, goals, and adaptive management, and resource protection measures (UWCD 2012d). Pursuant to this plan, UWCD conducts annual tamarisk eradication and monitoring activities.

Invasive wildlife

Quagga mussels (*Dreissena rostriformis bugensis*) were discovered in Lake Piru Reservoir on December 18, 2013. The mussels were found in the Cow Cove area of the reservoir. Currently, adult mussels and veligers have been observed throughout Lake Piru Reservoir with hotspots in the northeast and southeast parts of the lake and on human-made infrastructure (i.e., the floating docks, the intake barge for potable water, and the intake structure for the dam), and along lower Piru Creek in the reach situated between the dam release pool downstream to UWCD's property boundary with Rancho Temescal. Monitoring activities to date have not detected veligers along the reach of lower Piru Creek that is situated between the confluence of the Santa Clara River to approximately 0.25 miles upstream (adjacent to UWCD's Piru Spreading Grounds facility). However, 18 small (4-6 mm), adult quagga mussels were detected on cobbles (20 cobbles surveyed) at this location during UWCD's monthly streambed survey on October 17, 2017. Since the discovery of quagga mussels in 2013, UWCD has researched, developed, tested, and implemented various monitoring, containment, and control measures to delineate, characterize, and address the infestation. UWCD has also developed a Draft Quagga Mussel Monitoring and Control Plan

to identify an integrated pest management program framework to guide monitoring, containment, and control efforts (UWCD 2018b).

The American bullfrog, African clawed frog, red swamp crayfish (*Procambarus clarkii*), and invasive fishes are also present in the Project area. Per the *Revised Lower Piru Creek Herpetological Monitoring Plan* (UWCD 2012b), UWCD implements eradication activities for these species in the spillway pools to remove species that may compete with or predate upon native species.

5.5.2.4 Special-status Plant Species

Protocol floristic surveys completed in 2004 as part of the relicensing efforts for the Santa Felicia Hydroelectric Project encompassed the current Project area, and no special-status species were observed (UWCD 2004a). Additional reconnaissance level/non-protocol surveys have been completed by qualified biologists annually within the entire Vegetation and Noxious Weed Management Plan Area since 2012 (UWCD 2010a, BRC 2016).

Slender mariposa lily (*Calochortus clavatus* var. *gracilis*) was observed within the Project area and vicinity during annual vegetation monitoring in 2016 (BRC 2016). This species has a CRPR of 1B.2. Slender mariposa lily is a perennial herb (bulb) that is native to California. It is generally encountered within chaparral habitat on shaded hillsides of canyons at elevations below 1,000 meters. This species generally blooms from May to June (BRC 2016). Sixteen locations of slender mariposa lily were incidentally observed during the 2016 noxious weed survey. Approximately 153 individuals were observed to be in full bloom at the time of the surveys; the majority were found on moderately sloped hills north of the Juan Fernandez Boat Launch Area, and one population, composed of 20 individuals, was observed in native scrub habitat between the Santa Felicia Dam hydroelectric plant and the main access road (BRC 2016). The species was not observed during the 2017 general reconnaissance survey, but suitable habitat still exists, and it is presumed the species still occurs in the Project area and vicinity.

5.5.2.5 Special Plant Communities

The following special communities were identified during the CNDDDB query: California Walnut Woodland, Canyon Live Oak Ravine Forest, Cismontane Alkali Marsh, Coastal and Valley Freshwater Marsh, Mainland Cherry Forest, Riversidian Alluvial Fan Sage Scrub, Southern California Threespine Stickleback Stream, Southern Coast Live Oak Riparian Forest, Southern Cottonwood Willow Riparian Forest, Southern Mixed Riparian Forest, Southern Riparian Scrub, Southern Sycamore Alder Riparian Woodland, Southern Willow Scrub, Valley Oak Woodland, and Walnut Forest.

Of the 15 communities generated by the literature search, six occur within the Project area and vicinity. Coastal and Valley Freshwater Marsh occurs intermittently along the margins of Lake Piru Reservoir and within the spillway channel, lower Piru Creek release channel, and lower Piru Creek. These areas are mapped as ruderal, open water/rock, and Fremont cottonwood forest. Riversidian Alluvial Fan Sage Scrub, mapped as scale broom scrub, is found on floodplain areas associated with the spillway and lower Piru Creek release channels, and is mapped throughout the southern part of the Project area. Four riparian communities, including Southern Cottonwood Willow Riparian Forest, Southern Mixed Riparian Forest, Southern Riparian Scrub and Southern Willow Scrub are found intermittently along the spillway channel, lower Piru Creek release channel, and lower Piru Creek. Within the Project area, these areas are mapped as open water/rock and Fremont cottonwood forest based on overstory dominance of that species.

5.5.2.6 Special-status Wildlife Species

Birds. Protocol surveys for southwestern willow flycatcher and least Bell's vireo were completed in Spring 2004 in support of relicensing effort for the Santa Felicia Hydroelectric Project. The surveyed area included portions of lower Piru Creek from the Santa Felicia Dam outlet works to the town of Piru (Greaves 2004). Neither species was detected during the 2004 surveys, and according to the author,

neither species was expected to nest in the surveyed area. However, suitable habitat was observed in mature stands of cottonwood and dense stands of mulefat and willow. Observations of special-status bird species recorded in the Project area included the following: Cooper's hawk (*Accipiter cooperi* [CDFW Watch List]), yellow warbler (*Setophaga petechial* [CSSC]), yellow-breasted chat (*Icteria virens* [CSSC]), and loggerhead shrike (*Lanius ludovicianus* [CSSC]) (UWCD 2004b, Greaves 2004). Ninety-six bird species were recorded in the survey area (Greaves 2004).

More recently, protocol surveys for western yellow-billed cuckoo, southwestern willow flycatcher, and least Bell's vireo were conducted within the Project area in the spring of 2016: Least Bell's vireo and yellow warbler were observed below the spillway and along lower Piru creek immediately below the current outlet works (Griffith Wildlife Biology 2016). California condor (*Gymnogyps californianus* [FE/SE/CFP]) was also observed during the protocol surveys and has been observed soaring over the Project area with a few sightings of temporary landings (Griffith Wildlife Biology 2016; UWCD observations). Condor nesting has been observed and is monitored by the USFWS in Agua Blanca Creek, a tributary to middle Piru Creek upstream of Lake Piru Reservoir (USFWS 2016). No southwestern willow flycatcher or western yellow-billed cuckoo were detected in the Project area during 2016 surveys; however, the Project area was found to have suitable habitat for the southwestern willow flycatcher. Habitat was less suitable for the western yellow-billed cuckoo, which prefers large continuous blocks (>200 acres) of dense riparian woodland (Griffith Wildlife Biology 2016).

Least Bell's vireo and southwestern willow flycatcher are well documented along the Santa Clara River (CDFW 2017b-e, UWCD 2004b, Griffith Wildlife Biology 2016). Both species have benefited from control of the nest-parasitizing brown-headed cowbird (*Molothrus ater*), habitat recovery, and focused habitat restoration (UWCD 2004b, Griffith Wildlife Biology 2016).

Mammals. No special-status mammals have been observed or have a high potential to occur in the Project area (Table 5.5-2; Appendix B Table 2). Special-status mammals with a moderate potential to occur in the Project area include pallid bat, western mastiff bat, San Diego black-tailed jackrabbit, San Diego desert woodrat, and American badger due to known ranges of the species and the presence of vegetation communities that provide the potential for suitable habitat.

5.5.2.7 Special-status Aquatic Species

Reptiles and Amphibians. Wildlife surveys were conducted in 2004 as part of the relicensing efforts for the Santa Felicia Hydroelectric Project. The surveys encompassed the area adjacent to and in the vicinity of Santa Felicia Dam and Lake Piru Reservoir as well as all areas covered by the FERC license. The focus of the surveys included two listed amphibian species: arroyo toad (*Anaxyrus californicus* [FE/CSSC]) and California red-legged frog (*Rana draytonii* [FT/CSSC]) (UWCD 2004a, Greaves 2004, Sandburg 2004). During the 2004 surveys, arroyo toads and California red-legged frogs were not observed; however, sightings of special-status reptiles included western pond turtle (*Actinemys marmorata* [CSSC]), Blainville's horned lizard (*Phrynosoma blainvillii*), (coastal) whiptail (*Aspidoscelis tigris stejnegeri* [CSSC]), and two-striped garter snake (*Thamnophis hammondi* [CSSC]). Incidental observations of two CSSC reptiles, coastal whiptail and Blainville's horned lizard, were recorded during annual surveys for the Vegetation and Noxious Weeds Management Plan (BRC 2016).

Additional surveys have been completed annually since 2012 (and are ongoing) in accordance with Revised Lower Piru Creek Herpetological Monitoring Plan requirements (UWCD 2012). This plan includes spring and summer aquatic exotic species management in the spillway channel below Santa Felicia Dam. Methods include using gigs, various traps, hook and line and gill nets to capture exotic aquatic species in isolated pool habitats within the spillway channel habitats. Special-status species observed during these surveys included western pond turtle and two-striped garter snake (UWCD 2012c, 2013, 2014, 2015a, 2016b).

Fish. Arroyo chub (*Gila orcuttii*) and Santa Ana sucker (*Catostomus santaanae*) were observed in lower Piru Creek during surveys conducted in 2003 (UWCD 2004c). These species are also known to occupy Lake Piru Reservoir and Piru Creek upstream of the reservoir (UWCD 2004c).

Southern California steelhead (the form of *O. mykiss* that exhibit the anadromous life history trait) are listed as endangered under the Federal ESA. No *O. mykiss* were observed during surveys conducted throughout lower Piru Creek in 2003. Habitat data supported the hypothesis that spawning habitat was the limiting factor related to the absence of *O. mykiss* in lower Piru Creek at that time. During a spill event at Santa Felicia Dam in 2005, rainbow trout (the form of *O. mykiss* that exhibits the resident life history trait) were observed going over the spillway at the dam. Rainbow trout have been observed at various locations in lower Piru Creek from 2005 through 2016, mostly in the release channel immediately below the dam.

Resident rainbow trout have been reported historically by sport fishers in Lake Piru Reservoir. Stocking of hatchery rainbow trout in Lake Piru Reservoir was common, with 40,000 pounds of fish stocked annually until February 2010 when trout stocking ended (C. Strahan pers. comm.). UWCD conducted a creel census survey of Lake Piru Reservoir sport fishers from August 2014 to May 2015. Of the 26 sport fishers surveyed, the following species were reported: 22 largemouth bass; two crappie; one redear sunfish; and one potential rainbow trout (illegible form). Additionally, rainbow trout were not detected during a fish survey conducted by CDFW in 2014 (CDFW 2014).

5.5.2.8 Critical Habitat

Critical habitat as provided by USFWS ArcGIS Online Web Services (USFWS 2017b) is depicted in Figure 5.5-2. Critical habitat for six Federally listed species has been designated within a five-mile radius of the Project area. Designated critical habitat located within the Project area includes habitat for southern California steelhead, which has been designated along the length of lower Piru Creek extending from the Santa Felicia Dam outlet works to the confluence with the Santa Clara River and along the Santa Clara River downstream to the Pacific Ocean. The Project area also includes designated critical habitat for the southwestern willow flycatcher, which occurs along the entirety of the Santa Clara River from the Pacific Ocean to Castaic Junction at Interstate 5 and along Piru Creek upstream from its confluence with the Santa Clara River, encompassing the ordinary high-water line of Lake Piru Reservoir and extending north to approximately 2 miles downstream of Pyramid Lake. Portions of the Santa Felicia Dam spillway and the main access road for heavy equipment occur within designated critical habitat for the southwestern willow flycatcher.

The Sespe Condor Sanctuary, which is designated critical habitat for the California condor, occurs approximately 2.5 miles west of the Project area. Critical habitat for California condor also occurs in Piru Creek and tributaries approximately 5.5 miles upstream of Santa Felicia Dam. Designated critical habitat for arroyo toad and California red-legged frog occurs approximately 2.7 and 3.4 miles, respectively, upstream of Santa Felicia Dam. The nearest critical habitat for least Bell's vireo is a segment of the Santa Clara River located approximately 2 miles east of the town of Piru and upstream to Castaic Junction, near Interstate 5. This critical habitat area is approximately 3.5 miles southeast of the Project area (USFWS 2017a).

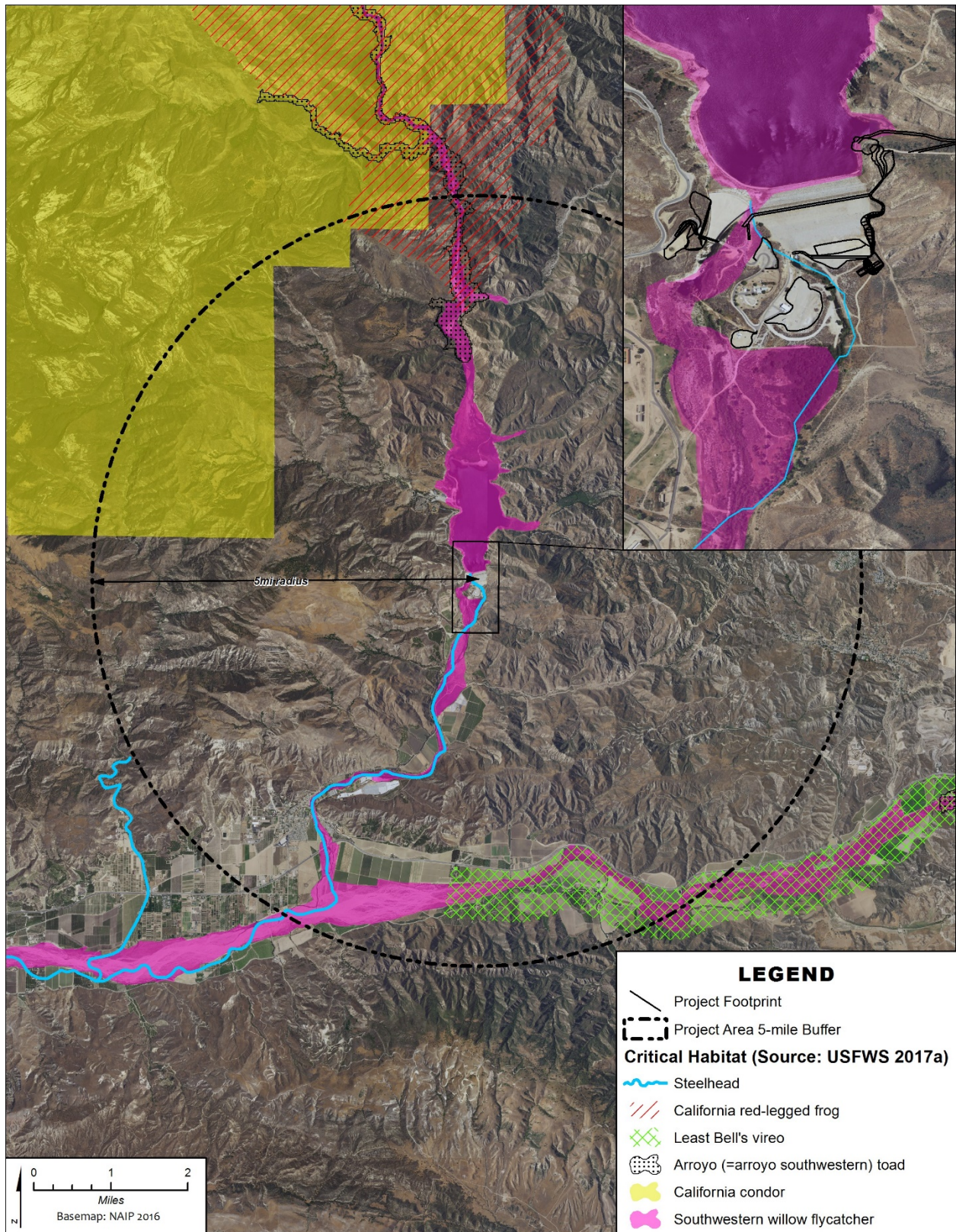


Figure 5.5-2 Critical Habitat

5.5.2.9 Waters and Wetland Resources

Water bodies are potentially subject to State and Federal jurisdiction. Waters of the United States (Waters of the US), as defined by Section 404 of the Clean Water Act, include all waters susceptible to use in interstate or foreign commerce, including waters subject to the ebb and flow of the tide and all tributaries of those waters. Wetlands that are situated adjacent to water bodies or those wetlands with a significant biological nexus to a jurisdictional water are often considered jurisdictional wetlands, which are a subset of Waters of the US and are defined as “areas that are inundated or saturated by surface or ground water at a frequency sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Three parameters are used in the field to delineate wetlands: hydrophytic vegetation, hydric soils, and wetland hydrology. A protocol-level wetland delineation is required to gather data sufficient to support a potential jurisdictional delineation of wetland areas.

Waters of the State are defined more broadly than Waters of the US and are defined in California Water Code section 13050 (e) as “any surface water or groundwater, including saline waters, within the boundaries of the state”. The jurisdiction of the State also extends to the top of bank and/or the upslope edge of the riparian corridor, and those areas subject to authorizations under the Streambed Alteration Program.

Within the Project area, waters and wetland areas include Lake Piru Reservoir, lower Piru Creek, and the spillway channel. Additionally, one small ephemeral drainage was observed in the northeastern portion of the Project area near the location of the intake for the proposed outlet works.

Lake Piru Reservoir and lower Piru Creek. Lake Piru Reservoir is created by the impoundment of Piru Creek by Santa Felicia Dam. Hydraulic connectivity to lower Piru Creek is maintained via the outlet works at the base of the dam and through the spillway channel when spills occur. Water releases from Santa Felicia Dam are prescribed in the Santa Felicia Water Release Plan, which includes schedules for habitat, migration, and alternative operations water releases (UWCD 2012a). Under the water release plan, UWCD is required to release minimum habitat water releases year-round. Minimum required habitat water releases range between 7 and 20 cfs and are based on cumulative rainfall criteria. Water releases can be reduced to no less than 5 cfs under certain conditions to allow for conducting dam safety activities that require closure of the penstock. Minimum required water releases are increased to 200 cfs when migration water release trigger criteria are met.

No protocol wetland delineation surveys have been completed within the Project area; however, based on this hydraulic connectivity to the Pacific Ocean, all areas within the Ordinary High Water Mark (OHWM) of the features listed above are considered potential jurisdictional Waters of the US. Likewise, all surface water and groundwater associated with those features are considered Waters of the State.

Spillway Channel. The upper portion of the spillway channel immediately below the Santa Felicia Dam spillway consists of a narrow, bedrock-dominated channel that includes several small, spring-fed pools. Spills from Lake Piru Reservoir only occur in very wet years with the last one occurring in 2006. These isolated pools are partly vegetated with a mix of cattails and other herbaceous wetland vegetation. The channel begins at the spillway crest and plunges approximately 100 feet into the largest of the three perennial pools. This pool is lined with emergent cattails as well as willows, mulefat, and Fremont cottonwood. Downstream of the largest pool, two or three smaller intermittent pools exist, depending on hydrologic conditions. The lower reach of the spillway channel downstream of the pools is dry and is ephemeral. The confluence of the spillway channel with lower Piru Creek is approximately 0.4 miles downstream of the spillway crest.

5.5.2.10 Wildlife Movement Corridors

The Project area is mapped within both the Santa Monica-Sierra Madre and the Sierra Madre-Castaic Connection. The Santa Monica-Sierra Madre connection stretches from the Santa Monica Mountains at

the coast to the Santa Susana and Sierra Madre Ranges off the Los Padres National Forest. The Sierra Madre-Castaic Connection serves as a linkage between the Los Padres and the Angeles National Forests (South Coast Wildlands 2008).

Wildlife corridors are defined as areas that connect suitable habitat in a region otherwise fragmented by rugged terrain, changes in vegetation, or human development. Natural features, such as drainages, ridgelines, or areas with dense vegetation cover can provide corridors for wildlife movement. Wildlife corridors (1) provide access to shelter, mates, food, and water; (2) allow the dispersal of individuals away from high population density areas; and (3) allow immigration and emigration of individuals to other populations for gene flow between populations. Wildlife corridors are considered sensitive by resource and conservation agencies.

Within the Project area, drainage features including lower Piru Creek and the spillway channel represent important wildlife corridors. These areas provide dense vegetative cover, water, and important linkages to larger, more continuous and un-fragmented habitat areas associated with the Santa Clara River.

Santa Felicia Dam currently acts as a barrier to upstream and downstream migration of *O. mykiss* and other aquatic species. Reasonable and Prudent Alternative No. 3 (RPA 3), a condition of the FERC license for the Santa Felicia Hydroelectric Project (FERC Project No. 2153-CA) and the associated NMFS biological opinion, requires UWCD to provide passage of steelhead at or around the Santa Felicia Dam or other suitable alternatives to passage (NMFS 2008). This work is independent of the proposed Project and is discussed further in Section 6, Cumulative Impacts.

5.5.3 Regulatory Framework

5.5.3.1 *Federal*

5.5.3.1.1 Federal Endangered Species Act of 1973

Enacted in 1973, the Federal ESA prohibits take, possession, sale, or transport of proposed, candidate, or listed species. "Take" is broadly defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (50 CFR Section 17.3). For endangered plants, the ESA prohibits removing, possessing, maliciously damaging, or destroying any endangered plant on Federal land and removing, cutting, digging-up, damaging, or destroying any endangered plant on non-Federal land in knowing violation of State law (16 USC 1538). The ESA also designates critical habitat for Federally listed species and protects these species from interference with vital breeding and behavioral activities and from critical habitat degradation.

Under Section 7(a) (2) of the ESA, Federal agencies with discretionary authority must consult with NMFS and/or USFWS if a Federal action may jeopardize the continued existence of threatened or endangered species or could result in the destruction or adverse modification of habitat of such species. Section 10(a) of the ESA provides for issuance of incidental take permits to private parties (non-Federal) with the development of a habitat conservation plan (HCP).

The Santa Felicia Hydroelectric Project is subject to Section 7(a) (2) of the ESA under the license issued to UWCD by FERC (FERC Project No. 2153-CA). When the license for the Santa Felicia Hydroelectric Project was issued in 2008, seven Federally listed aquatic and wildlife species were identified as potentially occurring in the vicinity of the Project: southern California steelhead, arroyo toad, California red-legged frog, mountain yellow-legged frog, California condor, southwestern willow flycatcher, and least Bell's vireo. USFWS concurred with the finding that relicensing the Santa Felicia Hydroelectric Project with, recommended measures, would have no effect on mountain yellow-legged frog, California condor, southwestern willow flycatcher, and the least Bell's vireo, and would be not likely to adversely affect the arroyo toad and California red-legged frog (FERC 2008). NMFS issued a biological opinion for the Santa Felicia Hydroelectric Project on May 5, 2008 and concluded the project was likely to jeopardize the continued existence of the endangered Southern California DPS of steelhead and was likely to destroy or

adversely modify critical habitat for the species (NMFS 2008). RPAs were included in the biological opinion that NMFS considered necessary and appropriate to avoid the likelihood of jeopardizing the continued existence of the southern California steelhead DPS or resulting in the destruction or adverse modification of critical habitat (NMFS 2008).

UWCD, as FERC's designated non-Federal representative, is currently receiving Technical Assistance from NMFS for the proposed Project. FERC will comply with Section 7 of the ESA and consult with NMFS, when it conducts NEPA review of the Project.

5.5.3.1.2 Migratory Bird Treaty Act, as Amended (16 USC 703-711)

Under the Migratory Bird Treaty Act (MBTA), it is illegal to pursue, kill, harm, collect, purchase, or sell North American birds or their parts, nests, or eggs. It applies to most bird species that spend all or a portion of their life cycle in the United States. Some game bird species are allowed to be hunted during specific periods with a valid hunting license issued by the Federal or State government, and permits may be issued for certain activities such as scientific collection and propagation. These regulations would require that elements of the Project (specifically vegetation removal or construction near nest trees) be reduced or eliminated during critical phases of the nesting cycle unless surveys by a qualified biologist demonstrate that nests, eggs, or nesting birds will not be disturbed, subject to approval by the CDFW and/or the USFWS.

5.5.3.1.3 Bald and Golden Eagle Protection Act, as Amended (16 USC 668-668c)

The Bald and Golden Eagle Protection Act (BGEPA) legally protects the bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*), in addition to the protection provided by the MBTA. The BGEPA prohibits the "take" of bald and golden eagles and their parts, nests, or eggs, and it is illegal to pursue, shoot, shoot at, wound, kill, capture, trap, collect, molest, or disturb them. The illegal act of "disturbing" bald or golden eagles includes any activities that may cause injury, disruption to productivity, and/or interference with normal behaviors. "Disturbance" also covers any manmade alterations near a previously used eagle nest site that agitate an eagle to a degree that it interferes with normal behaviors and leads to injury, death, or nest abandonment. These regulations would require that elements of the Project (specifically vegetation removal or construction near nest trees) be reduced or eliminated during critical phases of the nesting cycle unless surveys by a qualified biologist demonstrate that nests, eggs, or nesting birds will not be disturbed, subject to approval by the CDFW and/or the USFWS.

5.5.3.1.4 Executive Order 11990: Protection of Wetlands

The purpose of Executive Order 11990 is to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands". It directs Federal agencies to consider alternatives to wetland sites for any developments, and to limit potential damage if activities affecting a wetland cannot be avoided. Activities that will affect wetlands should not commence unless the agency has determined that there are no practicable alternatives, measures are included to minimize impacts on wetlands, and that any impacts will be minor. Additionally, Federal agencies should avoid giving direct or indirect support to proposed projects that encroach on wetlands.

5.5.3.1.5 Executive Order 13112: Invasive Species

Executive Order 13112 instructs Federal agencies to take actions to prevent the introduction and spread of non-native, invasive species in the United States. Invasive species are defined as "any species, including its seeds, eggs, spores, or other biological material capable of propagating the species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health." The National Invasive Species Council (NISC) is responsible for overseeing the implementation of the order. The goals of the NISC include increased interagency coordination and enhanced effectiveness in controlling invasive species. Invasive plants that must be

addressed as part of the NEPA analysis for a proposed project can be found on the State's noxious weed list, as directed by the Federal Highway Administration Guidance.

UWCD has prepared a Vegetation and Noxious Weed Management Plan for the Santa Felicia Project (FERC Project No. 2153-012) to comply with Article 405 of its 2008 FERC license. The plan was prepared in consultation with the US Department of Agriculture Forest Service (USDA-FS), the California Department of Food and Agriculture, and the Ventura County Agricultural Commissioner. The Plan describes the measures implemented to identify characterize, monitor, and control noxious weeds within the Project area and the approach to managing and restoring vegetation within the Project area. In addition, UWCD has developed a *Strategy for Treatment and Eradication of Tamarix ramosissima* in consultation with the Los Padres National Forest to identify priority areas of infestation, eradication protocols, goals, and adaptive management, and resource protection measures for this invasive species (UWCD 2012).

UWCD has also prepared a Draft Quagga Mussel Monitoring and Control Plan, in consultation and coordination with CDFW, FERC, and NMFS, to comply with California FGC §2301.

5.5.3.1.6 Clean Water Act of 1977, Sections 401 and 404 (Public Law 95-217)

The CWA (33 USC Section 1251 et seq.), formerly the Federal Water Pollution Control Act of 1972, was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. Under Section 404 of the CWA, the USACE and the USEPA regulate the discharge of dredge or fill material into waters of the United States. Waters of the United States include navigable waterways and wetlands adjacent to navigable waterways, and non-navigable waterways and wetlands adjacent to non-navigable waters that are contiguous with navigable waterways. The term "waters of the United States" is defined by 33 CFR Part 328 and currently includes (1) all navigable waters (including all waters subject to the ebb and flow of the tide), (2) all interstate waters and wetlands, (3) all other waters (e.g., lakes, rivers, intermittent streams) that could affect interstate or foreign commerce, (4) all impoundments of waters mentioned above, (5) all tributaries to waters mentioned above, (6) the territorial seas, and (7) all wetlands adjacent to waters mentioned above. For regulatory purposes, "wetlands" are defined as areas "...inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated solid conditions" (333 CFR 328.3, 40 CFR 230.3). Applicants must obtain a permit from the USACE under Section 404 of the CWA for all discharges of fill material into waters of the United States, including wetlands, before proceeding with a proposed action.

The State of California regulates discharge of material into waters of the State pursuant to Section 401 of the CWA. Jurisdictional waters of the State requiring a CWA Section 404 permit, would also require a Section 401 Water Quality Certification. The SWRCB and/or the local Regional Water Quality Control Board (RWQCB) are the relevant permitting agencies.

The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point sources discharges into surface water. Those discharges are regulated by the NPDES permit process (CWA Section 402).

5.5.3.2 State

5.5.3.2.1 California Endangered Species Act (Fish and Game Code, Sections 2050-2115.5)

The CDFW is responsible for administering the CESA. CESA prohibits the "take" of State-listed species unless an incidental take permit is granted. Exceptions are California Fully Protected Species for which no take is authorized.

Section 2081 of the California FGC gives the CDFW the authority to issue an incidental take permit for projects that have the potential for take of special-status species, including State-listed species, as long as the impacts are minimized and fully mitigated and will not jeopardize the continued existence of a State-listed species. The measures required to minimize and fully mitigate impacts must be roughly proportional to the extent of the proposed impact on the species and must be capable of successful implementation while maintaining the applicant's objectives to the greatest extent feasible.

Section 2080.1 provides an alternative to the Section 2081 permit process by allowing for "take" once an applicant obtains a Federal Incidental Take Permit, which can be approved (via Consistency Determination letter) within 30 days by the CDFW Director. If the Federal Incidental Take Statement is determined not to be consistent with CESA, then application for a State Incidental Take Permit (pursuant to Section 2081) is required.

5.5.3.2.2 State CEQA Guidelines, Section 15380

Enacted in 1970, CEQA requires an applicant to fully disclose potential environmental impacts before issuance of a permit by State and local agencies. State CEQA Guidelines Section 15380(b) provides that a species not listed on the Federal or State list of protected species may be considered rare or endangered if the species can be shown to meet certain criteria. According to the CNPS, plants having a CRPR of 1A (plants presumed extirpated in California and either rare or extinct elsewhere), 1B (plants rare, threatened, or endangered in California and elsewhere), 2A (plants presumed extirpated in California, but common elsewhere), 2B (plants rare, threatened, or endangered plants in California), or 3 (plants about which more information is needed – a review list) fit the definition of "Rare or Endangered" under CEQA Guideline Section 15380. According to CNPS's Rare Plant Program, species with these CRPR rankings meet the definition of "rare and endangered" under the aforementioned Section 15380 criteria. Impacts on these species would be considered "significant" and would require mitigation. Plants with a CRPR rank of 1A-3 with the potential to occur in the project area are identified in Section 5.5.2.6, and potential impacts of the Project on these species are discussed in Sections 5.5.4.2-5.5.4.4.

5.5.3.2.3 California Species of Special Concern

CSSC is an administrative designation by CDFW and carries no formal legal status. These species are designated by the CDFW with the goal of focusing attention on animals with conservation risk, to stimulate research on poorly known species, and to achieve conservation and recovery of these animals before they meet criteria for listing under CESA. CSSC should be considered during the environmental review process.

CEQA (California Public Resources Code Sections 21000-21177) requires State agencies, local governments, and special districts to evaluate and disclose impacts from "projects" in the State. Section 15380 of the CEQA Guidelines clearly indicates that species of special concern should be included in an analysis of project impacts if they can be shown to meet the criteria of sensitivity outlined therein.

Sections 15063 and 15065 of the CEQA Guidelines, which address how an impact is identified as significant, are particularly relevant to CSSCs. Project-level impacts on listed (rare, threatened, or endangered species) species are generally considered significant, thus requiring lead agencies to prepare an Environmental Impact Report to fully analyze and evaluate the impacts. In assigning "impact significance" to populations of non-listed species, analysts usually consider factors such as population-level effects, proportion of the taxon's range affected by a project, regional effects, and impacts on habitat features. CSSC with the potential to occur in the project area are identified in Sections 5.5.2.8 and 5.5.2.9, and potential impacts of the Project on these species are evaluated in the Section 5.5.4.2-5.5.4.4.

5.5.3.2.4 California Fully Protected Species (Fish and Game Code Sections 3511, 4700, 5050, 5515)

CDFW began to designate species as “fully protected” prior to the creation of the CESA and the ESA. Lists of fully protected species were initially developed to provide protection to those animals that were rare or faced possible extinction, including fish, amphibians, reptiles, birds, and mammals. Many fully protected species have since been listed as threatened or endangered under the CESA and/or the ESA. Fully protected species may not be taken or possessed at any time. The FGC lists birds (Section 3511), mammals (Section 4700), reptiles and amphibians (Section 5050), and fish (Section 5515). CFP species with the potential to occur in the project area are identified in Table 5.5-2 and potential impacts of the Project on these species are evaluated in the Section 5.5.4.2-5.5.4.4.

5.5.3.2.5 Native Plant Protection Act

Under the Native Plant Protection Act (FGC Section 1900-1913), the CDFW must establish criteria for determining whether a species, subspecies, or variety of native plant is endangered or rare. The Native Plant Protection Act is administered by the CDFW. The CDFW Commission has the authority to designate native plants as “endangered” or “rare” and to protect them from take. Under Section 1913(c) of the Native Plant Protection Act, the owner of land where a rare or endangered native plant is growing is required to notify the CDFW at least 10 days in advance of changing the land use, to allow for salvage of rare or endangered plants.

5.5.3.2.6 Streambed Alteration Program (Fish and Game Code Sections 1601-1606)

Under Section 1601 through 1606 of the FGC, the CDFW administers the Lake and Streambed Alteration Program in an effort to regulate “any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake.” Section 1602 requires the CDFW to be notified of any activity that might affect lakes and streams. The CDFW reviews the proposed actions and, if necessary, submits (to the applicant) a proposal that includes measures to protect affected fish and wildlife resources - both during and following construction.

As part of this Project, UWCD would obtain a Streambed Alteration Agreement in accordance with Section 1602 of the FGC for the realignment of the outlet works discharge to lower Piru Creek downstream of Lake Piru Reservoir.

5.5.3.2.7 Non-game Birds, Birds of Prey, Nests and Eggs (Fish and Game Code, Sections 3503, 3503.5, 3513, 3800).

FGC Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird—except as otherwise provided by the FGC or any regulation made pursuant thereto. Section 3503.5 protects all birds of prey (i.e., birds in the orders *Falconiformes* or *Strigiformes*) and their eggs and nests. Section 3513 states that it is unlawful to take or possess any migratory non-game bird as designated in the MBTA. These regulations would require that elements of the Project (specifically vegetation removal or construction near nest trees) be reduced or eliminated during critical phases of the nesting cycle unless surveys by a qualified biologist demonstrate that nests, eggs, or nesting birds will not be disturbed, subject to approval by the CDFW and/or the USFWS.

5.5.3.3 Local

5.5.3.3.1 Ventura County General Plan

Although the Santa Felicia Project is located in unincorporated Ventura County, it is exempt from local permit requirements because it is a water storage and power generation facility, and it is regulated by a license issued by FERC under the Federal Powers Act. Therefore, the Project is not subject to the provisions of the Ventura County General Plan. However, the goals and policies of the Ventura County General Plan (Ventura County 2016a) and Piru Area Plan (Ventura County 2011) related to biological

resources are described below, in order to evaluate CEQA significance criterion "e" listed in Section 5.5.4.1.

Ventura County General Plan

- > Goal 1.5.1. Preserve and protect significant biological resources in Ventura County from incompatible land uses and development. Significant biological resources include endangered, threatened, or rare species and their habitats, wetland habitats, coastal habitats, wildlife migration corridors, and locally important species/communities.
- > Policy 1.5.2-3. Discretionary development that is proposed to be located within 300 feet of a marsh, small wash, intermittent lake, intermittent stream, spring, or perennial stream (as identified on the latest USGS 7½ minute quad map), shall be evaluated by a County-approved biologist for potential impacts on wetland habitats. Discretionary development that would have a significant impact on significant wetland habitats shall be prohibited, unless mitigation measures are adopted that would reduce the impact to a less than significant level; or for lands designated "Urban" or "Existing Community", a statement of overriding considerations is adopted by the decision-making body.
- > Policy 1.5.2-4. Discretionary development shall be sited a minimum of 100 feet from significant wetland habitats to mitigate the potential impacts on said habitats. Buffer areas may be increased or decreased upon evaluation and recommendation by a qualified biologist and approval by the decision-making body. Factors to be used in determining adjustment of the 100-foot buffer include soil type, slope stability, drainage patterns, presence or absence of endangered, threatened or rare plants or animals, and compatibility of the proposed development with the wildlife use of the wetland habitat area. The requirement of a buffer (setback) shall not preclude the use of replacement as a mitigation when there is no other feasible alternative to allowing a permitted use, and if the replacement results in no net loss of wetland habitat. Such replacement shall be "in kind" (i.e., same type and acreage), and provide wetland habitat of comparable biological value. On-site replacement shall be preferred wherever possible. The replacement plan shall be developed in consultation with CDFW.
- > Policy 1.5.2-5. CDFW, USFWS, National Audubon Society, and the CNPS shall be consulted when discretionary development may affect significant biological resources.

Piru Area Plan

The Piru Area Plan contains the following Goals and Policies related to biological resources:

- > Goal 1.5.1-1. Protect and enhance the significant biological resources in the Piru area.
- > Refer to the discussion under Ventura County General Plan Goal 1.5.1.
- > Goal 1.5.1-2. Protect the Piru Creek wildlife migration corridor between the Los Padres National Forest on the north and the Santa Clara River and Oak Ridge Big Mountain habitat on the south.
- > Goal 1.5.1-3. Encourage and support the management policies of the USFWS, CDFW, and the Los Padres National Forest in its attempt to preserve and protect the California condor and its habitat.
- > Policy 1.5.2-2. All discretionary development located within 100 feet of Piru Creek or the Santa Clara River shall be sited and designed to prevent impacts which would significantly degrade riparian habitats. Discretionary projects located within or adjacent to these watercourses shall be conditioned to dedicate wildlife corridor easements if deemed necessary by the County to protect biological resources.
- > Policy 1.5.2-3. The CDFW, the USFWS and the National Audubon Society at the Condor Research Center shall be consulted when discretionary development proposals are submitted which may affect biological resources.

5.5.3.3.2 Ventura County Tree Protection Ordinance

Although the Project is not subject to the Ventura County permit requirements, this discussion evaluates the consistency of the Project with the Ventura County Tree Protection Ordinance in compliance with CEQA requirements. This ordinance applies to the pruning (beyond specified limits), removal, trenching, excavation, or other encroachment into the protected zone (5 feet outside the canopy's edge and a minimum of 15 feet from the trunk) of protected trees in unincorporated areas. Protected trees include all oaks and sycamores 9.5 feet in circumference or larger (measured 4.5 feet above ground), trees of any species with a historical designation, trees of any species 90 feet in circumference or larger, and most 9.5-foot native trees in the Scenic Resources Protection Zone. The ordinance includes the ability for the County to issue ministerial permits for the removal of protected trees when there are safety concerns.

5.5.4 Impacts and Mitigation Measures

Potential impacts associated with the Project can be classified as temporary or permanent and direct or indirect. Temporary impacts generally include those associated with construction activities, including the use of vehicles or other heavy equipment, the use of temporary workspaces, and storage/staging of construction materials and equipment. Permanent impacts generally include impacts associated with construction, installation, and operation of a new facility.

Direct impacts include the physical loss or removal of vegetation due to the installation of new facilities or work at staging areas. Indirect impacts during construction may include the interruption of normal nesting or foraging behaviors, loss of prey items, such as insects or food resources, or the suppression of growth due to excessive dust, noise, or light. Impacts on special-status species may occur either through temporary or permanent habitat loss, interruption of normal species routines, or through direct mortality.

Construction Activities. Construction activities associated with access, staging, and establishing work areas could result in temporary impacts on sensitive native plant communities, which in turn could cause direct or indirect impacts on special-status species. Similarly, the grading, excavation and establishment of new facility areas would result in permanent impacts on these areas. Moving construction vehicles and equipment could affect special-status plants and wildlife by directly crushing individuals while demolition, blasting and other construction activities would cause noise, dust and lighting, resulting in indirect impacts on wildlife using the area. Likewise, potential impacts from hazardous material spills, dust, equipment exhaust, and/or construction-related erosion and sedimentation could directly or indirectly affect native habitats and special-status species.

The construction of Component 1 (outlet works system) and the associated abandonment of a portion of the existing lower Piru Creek release channel would result in direct and permanent impacts on native riparian and scrub habitats and permanent removal of critical steelhead habitat. However, these impacts would be offset by irrigation of the current riparian habitat as discussed in Section 3.1.4 and the construction of a new channel from the new outlet works to lower Piru Creek (described in further detail below).

To allow for efficient construction of the new intake facilities, the reservoir would be lowered to elevation 950 feet msl or lower. The duration of low water conditions is expected to be approximately 48 months, which would allow for the potential establishment of ruderal and riparian-type vegetation on the newly exposed margin of Lake Piru Reservoir. Therefore, available aquatic habitat would be temporarily reduced, while terrestrial habitat would be temporarily increased. Water levels in the reservoir fluctuate under existing conditions due to changes in water inflows and releases, resulting in frequent changes in shoreline habitat conditions. Specific construction impacts on biological resources are discussed below.

Project Operation. Following construction of the new Project facilities, temporary use areas would be restored to pre-construction conditions. Project operations would remain unchanged from current operations; therefore, operation of the Project would have no impacts on biological resources.

5.5.4.1 Significance Criteria

UWCD reviewed Appendix G of the CEQA Guidelines to determine whether the Project would result in significant impacts related to biological resources. The criteria listed below consider if the Project would:

- a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or federal wildlife agencies.
- b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or federal wildlife agencies.
- c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of wildlife nursery sites.
- e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or State habitat conservation plan.

Criteria a through e are relevant to the construction phase of the Project and are discussed in Section 5.5.4.2. No adopted HCPs, Natural Conservation Community Plans, or other approved local, regional, or State habitat conservation plan are present in the Project area; therefore, no impacts would occur related to criterion f, and this criterion is not discussed further.

5.5.4.2 Proposed Project

Impact BIO-1: The Project would adversely affect individual special-status plant species (Construction – significant but mitigable to less than significant impact; Operation – no impact).

Construction

Impacts on special-status plant species could include crushing, damaging, or removing plants during construction; population fragmentation; the introduction of non-native species that may out-compete native plant species; and runoff or sedimentation and erosion that could adversely affect plant populations by altering site conditions. Construction-related dust could also hinder normal plant growth.

One special-status plant species, slender mariposa lily (CRPR 1B), has been observed in the Project area, and 19 have high or moderate potential to occur (Table 5.5-2) but were not observed in the Project area during the 2004 protocol surveys associated with the relicensing of the Santa Felicia Hydroelectric Project or in subsequent annual surveys of the Santa Felicia Hydroelectric Project Noxious Weed Management Area (UWCD 2016, BRC 2016). However, because it has been 13 years since protocol surveys were last completed in the Project area, evidence of the absence of special-status species within the Project area cannot be relied upon. Additionally, due to the annual nature of the majority of these species, the exact location of individuals cannot be known from year to year, and populations are expected to shift spatially within their preferred habitat. The special-status mariposa lily species, Peirson's morning glory, slender-horned spineflower, mesa horkelia, Southern California black walnut, Payne's bush lupine, Ojai navarretia, Lyon's pentachaeta, Hubby's phacelia, white rabbit-tobacco, chaparral ragwort have moderate to high potential to occur in chaparral and scrub communities located in the Project area. San Fernando Valley spineflower, paniculate tarplant, Gerry's curly-leaved monardella have moderate to high potential to occur in scrub habitats. Small areas of temporary and permanent habitat

loss would occur due to spillway widening, the expanded access road on the left abutment, and new hydroelectric facility and could result in significant impacts to special-status species located in these areas. Less than 0.5 acre of these sensitive native plant communities would be temporarily impacted during construction and just over 3 acres would be permanently impacted (Table 5.5-3).

Payne's bush lupine, white rabbit-tobacco, and Southern California black walnut are also associated with riparian habitats. The relocation of the outlet works system from the current right abutment to the left abutment would result in the dewatering of between 480-feet and 1,200-feet of existing channel in lower Piru Creek (depending on the final design) that is situated between the existing outlet works and the confluence of the discharge channel associated with the new outlet works. This change in location of the outlet works has the potential to affect the local shallow subsurface hydrology. A substantial lowering of the water level could result in significant impacts to special-status plant species that exist along the dewatered channel; however, irrigation would be provided for the existing riparian vegetation along the portion of lower Piru Creek that would be abandoned following completion of the Project. Therefore, potential impacts to special-status plant species located in this riparian habitat would be less than significant.

Operation

Following construction of the new Project facilities, temporary use areas would be restored to pre-construction conditions. Project operations would remain unchanged from current operations and existing ranges in water levels in Lake Piru Reservoir would remain the same; therefore, operation of the Project would have no impact on special-status plant species.

Mitigation Measures

UWCD would implement the following mitigation measures to minimize impacts to special-status plant species:

MM BIO-1. Conduct pre-construction vegetation surveys. Prior to construction, UWCD shall ensure that protocol surveys for special-status plant species are completed by a qualified biologist during the appropriate time of year. Surveys shall be conducted according to *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018), and shall occur within one year of construction commencement. If special-status species or plant communities are observed in areas planned for temporary or permanent disturbance, UWCD shall develop a plan to avoid impacts (MM BIO-2) that is specific to each species. If impacts cannot be avoided, UWCD shall consult with CDFW and/or USFWS in accordance with the State and Federal ESA.

MM BIO-2. Identify and implement BMPs. UWCD shall identify BMPs to reduce and/or eliminate construction-related impacts and develop a plan to implement these measures. Measures shall include but not be limited to a Worker Environmental Awareness Program (WEAP), designated work areas, fire prevention, dust control, vehicle/equipment idling restrictions and speed limits, night-time work restrictions, litter control program, biological monitoring, weed prevention, erosion and sediment control, hazardous materials management, and spill prevention and clean up. A Project Biologist shall be present onsite during the Project's ground and/or vegetation disturbances. The Biologist shall have the authority to stop work and shall be present to capture and relocate out of harm's way any species of low mobility that may be killed or injured during construction. Any captured species shall be relocated to adjacent and appropriate habitat not impacted by Project-related disturbance activities. All vegetation removal shall take place in a manner that allows wildlife to escape to contiguous, adjacent habitat.

Residual Impact

MM BIO-1 would serve to identify special-status plants and, in conjunction with MM BIO-2, would ensure that these species are avoided and protected during construction. These mitigation measures would ensure that potential construction impacts to special-status plant species are less than significant.

Impact BIO-2: The Project would cause a temporary disturbance or permanent loss of riparian and other sensitive native plant communities (Construction – significant but mitigable to less than significant impact, Operation – no impact).

Construction

Sensitive plant communities are naturally occurring plant assemblages that are reasonably expected to provide natural diversity and support sensitive and special-status species in the region. Sensitive native plant communities in the Project area include California buckwheat scrub, scale broom scrub, Fremont cottonwood forest, and open water/rock. Non-sensitive communities in the Project area include non-native grassland, ruderal areas, and developed areas; these areas are not expected to provide major ecological value and/or support special-status species. A summary of estimated temporary and permanent impacts (by planned feature) to sensitive and non-sensitive plant community types is provided in Table 5.5-3.

Table 5.5-3 Temporary and Permanent Impacts (acres) by Planned Feature and Vegetation Type

Planned Features	CBS	CSBS	DEV ¹	FCF	NNGL ¹	OWR	RUD ¹	TC	Total
Temporary Impacts									
Staging Area 1	--	--	1.37	--	--	--	--	--	1.37
Staging Area 2	--	--	3.90	--	--	--	--	--	3.90
Staging Area 3	--	0.10	1.06	--	--	--	--	--	1.16
Staging Area 4	--	0.11	0.91	--	0.01	--	--	--	0.92
Spoil Area	--	--	1.21	--	--	--	--	--	1.21
Temporary Bridge	--	--	0.01	0.01	--	--	--	--	0.02
Temporary Haul Road	--	--	0.04	--	--	--	0.54	0.23	0.80
Total Temporary Impacts	--	0.21	8.5	0.01	0.01	0.00	0.54	0.23	9.38
Permanent Impacts									
New Outlet Works	0.23	--	0.28	--	0.34	--	--	--	0.85
Dam Crest Raise	--	0.01	0.86	--	--	--	--	--	0.87
Intake Facilities	--	0.20	--	--	--	0.05	0.43	0.13	0.81
Improved Access Road	--	--	0.25	--	0.06	--	--	--	0.31
Spillway Deepening	--	--	1.27	--	--	0.08	--	--	1.36
Spillway Widening	--	1.60	0.17	--	0.01	0.03	--	--	1.81
Grading Area	--	0.62	0.76	--	0.12	--	--	0.16	1.66
Bridge Replacement	--	0.07	0.16	--	--	--	--	--	0.23
Access Road	--	0.07	0.50	--	--	--	--	0.04	0.61
Total Permanent Impacts	0.23	2.57	4.25	0.00	0.53	0.16	0.43	0.33	8.51

Notes: CBS (California buckwheat scrub), CSBS (California sagebrush-black sage scrub), DEV (developed), FCF (Fremont cottonwood forest), NNGL (non-native grassland), OWR (open water/rock), RUD (ruderal), TC (toyon chaparral).

¹Non-sensitive communities are shown in greyed out columns.

Of the estimated 9.38 acres of construction (temporary) impacts, only 0.45 acre of sensitive native plant communities would be temporarily impacted: California sagebrush-black sage scrub (0.21 acre), Fremont cottonwood forest (0.01 acre), and toyon chaparral (0.23 acre) (Table 5.5-3). Construction activities such

as vegetation removal, grading, and staging would directly affect these resources, while indirect impacts within and outside of these areas could result from dust, sedimentation, and hazardous material spill.

The relocation of the outlet works system from the current right abutment to the left abutment would result in the dewatering of between 480-foot and 1,200-foot of existing channel in lower Piru Creek (depending on the final design) that is situated between the existing outlet works and the confluence of the discharge channel associated with the new outlet works. This change in location of the outlet works has the potential to affect the local shallow subsurface hydrology. A substantial lowering of the water level could adversely affect the cottonwood (and any other) trees along the dewatered channel. Approximately 0.56 acre of cottonwood forest is present along the existing release channel; the majority of the 34.2 acres of cottonwood forest vegetation present in the Project area would remain unchanged.

Permanent impacts on native vegetation communities would result from construction of the permanent facilities, including the outlet works, new outlet works release channel, and spillway widening. In addition to 9.38 acres of temporary impacts, there would be 8.51 acres of permanent impacts, 3.29 acres of which include sensitive native plant communities: California buckwheat scrub (0.23 acre), California sagebrush-black sage scrub (2.57 acres), open water/rock (0.16 acre), and toyon chaparral (0.33 acre). Temporary and permanent alteration or loss of riparian or sensitive native plant communities would be significant.

Operation

Following construction of the new Project facilities, temporary use areas would be restored to pre-construction conditions. Project operations would remain unchanged from current operations and existing ranges in water levels in Lake Piru Reservoir would remain the same; therefore, operation of the Project would have no impact on special-status plant species.

Mitigation Measures

In addition to MM BIO-1 and MM BIO-2, discussed above, UWCD shall implement the following measures to mitigate impacts to riparian and sensitive plant communities:

MM BIO-3. Prepare and implement an Upland Revegetation and Aquatic, Riparian, and Wetland Restoration Plan. Prior to the disturbance of sensitive native plant communities and abandonment of the existing lower Piru Creek release channel, UWCD shall develop an Upland Revegetation and Aquatic, Riparian, and Wetland Restoration Plan (Restoration Plan) to describe measures to be implemented to restore and revegetate all native upland habitats, and create or restore all aquatic riparian habitat, including Federal and State jurisdictional wetlands and waters at a ratio established by Project permits as part of the new proposed outlet works channel. The Restoration Plan shall include details on creating suitable geomorphology and hydrology, as well as revegetation with native plant materials. The Restoration Plan shall establish interim and final performance criteria and a monitoring and reporting schedule. This plan shall be approved by the relevant permitting agencies (USACE, USFWS, NMFS, SWRCB, CDFW) prior to the onset of construction.

MM BIO-4. Design and construct a geomorphically stable channel connecting the new outlet works release point to the main lower Piru Creek channel. All discharges from the downstream control facilities and hydropower plant shall enter a new approximately 200-foot long discharge channel lined with riprap immediately downstream of the release point. Portions of the riprap shall be grouted to increase its resistance to erosion. Flows from the fixed-cone valves shall spray into the open air, with high velocity flows landing within the riprap discharge channel. The discharge channel shall then transition to an unlined channel connecting it to the existing lower Piru Creek channel. In addition to enhancing safety and operations of the Project by conveying the range of flows required by the Santa Felicia Hydroelectric Project FERC license and the DSOD, the new release channel shall be designed to: 1) provide high-quality spawning and rearing habitat for southern California steelhead; 2) create as much aquatic and riparian habitat as possible within the available area downstream of the proposed fish passage facility footprint; and, 3) establish a geomorphically stable channel that would be designed with an appropriate

slope and dimensions to convey the estimated sediment loads without excessive scour or deposition. Accordingly, the following design criteria shall be used to meet these objectives:

- > Pool-riffle habitat at a frequency appropriate with the geomorphic and hydrologic setting in accordance with guidelines provided in the California Salmonid Restoration Manual (Flosi et al. 2010), the Stream Restoration Design – National Engineering Handbook (NRCS 2007), and other relevant design guidelines;
- > High-flow refugia using side channels and/or high-flow bench or floodplain areas;
- > Pools of sufficient depth to provide high-quality rearing habitat in accordance with guidelines provided in the California Salmonid Restoration Manual (Flosi et al. 2010);
- > Aquatic habitat cover and complexity using features such as rootwads, large wood, rock weirs, etc.;
- > Riparian habitat along streambanks to provide cover and minimize erosion at a buffer width appropriate with the geomorphic and hydrologic setting in accordance with guidelines provided in the California Salmonid Restoration Manual (Flosi et al. 2010), the Stream Restoration Design – National Engineering Handbook (NRCS 2007), and other relevant design guidelines; and
- > Consistency with objectives established in other resource protection plans developed in compliance with the 2008 FERC license and associated biological opinion issued by NMFS.

The area available for construction of the new release channel and example conceptual channel cross-section design alternatives are shown in Figures 5.5-3 and 5.5-4, respectively. Technical Assistance from NMFS indicates that there is sufficient room at the location of the new discharge channel to achieve the design criteria and objectives. Final design would be developed during Section 7 consultation with NMFS in coordination with the NEPA process to be led by FERC. Prior to constructing the new channel to connect the new outlet works release point to the main lower Piru Creek channel, the final design of the channel shall be reviewed and approved by appropriate State and Federal agencies.

UWCD shall coordinate early consultation with CDFW to ensure all BMPs for conservation and protection of fish species (including Arroyo chub and Santa Ana sucker) occurs during all phases of Project implementation.

Residual Impact

MM BIO-1, 2, and 3 would ensure that all sensitive plant species are identified and that any potential impacts are mitigated. MM BIO-4 would create suitable habitat for sensitive and riparian species, including cottonwood trees. The physical area of impact to sensitive plant communities is relatively small, similar or higher quality habitat is readily available in the surrounding area, and implementation of the measures described above would mitigate potential impacts; therefore, construction impacts on sensitive plant communities would be less than significant.



Figure 5.5-3 Location of New Outlet Works and Available Area for New Release Channel

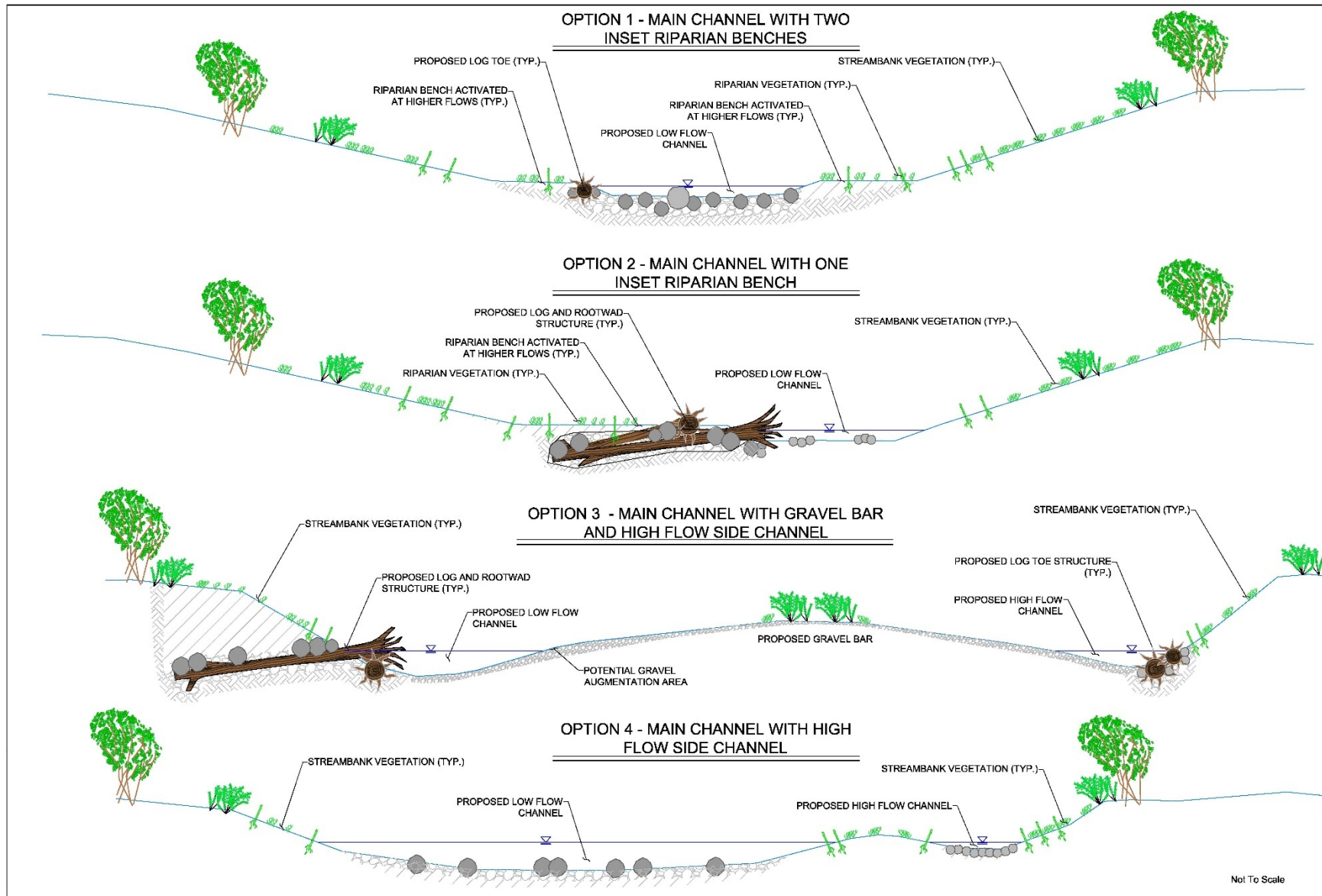


Figure 5.5-4 Example Conceptual Cross-Section Alternatives for New Release Channel

Impact BIO-3: The Project would result in temporary disturbance to special-status, migratory, or nesting birds (Construction - significant but mitigable to less than significant impact; Operation – No Impact).

Construction

Ten special-status bird species are known to occur or have moderate to high potential to occur in the Project area and vicinity (Table 5.5-2). Construction during the breeding season could cause nest removal or disturbance leading to nest failure, and these impacts would be significant. Indirect impacts, such as truck and construction equipment noise and ground disturbance, could also cause nest abandonment and reduced reproductive success. Direct impacts on riparian habitat would result from abandonment of approximately 480 feet of the existing lower Piru Creek release channel due to outlet works relocation, resulting in significant alteration of riparian habitat that represents suitable nesting habitat for various special-status birds. Least Bell's vireo is known to nest in the Project area and along the exiting lower Piru Creek release channel, and southwestern willow flycatcher, yellow-breasted chat, and yellow warbler have been observed in the Project area and have a high likelihood of nesting in the suitable riparian habitat along the channel. However, potential impacts to these species would be less than significant due to irrigation of the current riparian habitat as discussed in Section 3.1.4

Loggerhead shrike, California condor, and white-tailed kite would only be present in the Project area as transient visitors, and habitat for resting during migration is available nearby so that any individuals passing through the area could avoid construction disturbances. Therefore, construction impacts on transient bird species would be less than significant. Other migratory bird species could occur in the Project area and could potentially nest in both sensitive and non-sensitive plant communities. Construction activities would represent a less than significant impact on those species because an abundance of equally or more suitable habitat is available in the Project vicinity.

Coastal gnatcatcher has moderate potential to occur in the Project area and occupies coastal sage scrub. A small area of this habitat would be impacted during construction (less than 3 acres, as shown in Table 5.5-3), and the Project vicinity contains abundant suitable habitat for the species. Thus, impacts to this species would be less than significant.

The burrowing owl has moderate potential to occur in the Project area and makes its nest in the ground. Therefore, it could be affected by ground disturbance activities such as clearing and grading, heavy equipment use, and new facility construction. Potential impacts to burrowing owl would be less than significant as the area of disturbance relative to available habitat is small, and the species is likely to avoid the Project area during construction and would utilize more suitable habitat in the vicinity.

Construction of new intake facilities and a temporary haul road on the left abutment would occur in a small portion of area mapped as critical habitat for southwestern willow flycatcher (0.69 acre). However, no high-quality breeding habitat would be lost, the general land use would remain unchanged once construction is complete, and the footprint for construction activities would be relatively small at both the spillway and the bridge locations.

Operation

Project operations would remain unchanged from current operations; therefore, operation of the Project would have no impact on special-status birds.

Mitigation Measures

In addition to MM BIO-1 through MM BIO-4, UWCD would implement the following procedures to mitigate impacts to special-status terrestrial wildlife and migratory bird species:

MM BIO-5. Protection of nesting birds. UWCD shall coordinate with CDFW to establish a Nesting Bird Plan prior to Project construction. Construction activities shall be scheduled to avoid direct impacts on

riparian habitat (i.e., trimming or removal of vegetation) associated with the spillway, existing outlet channel, and lower Piru Creek during the nesting bird season, from March 15 to September 15. Removal of potential nesting habitat (e.g., trees and shrubs) necessary for construction activities shall be conducted before the nesting bird season to the extent feasible and practicable. If work in habitat suitable for nesting must be scheduled during this period, a pre-construction survey by a qualified biologist shall be completed to confirm that active nests would not be affected. If an active nest is detected within the construction area, work shall be halted and redirected away from the site. In this situation, a qualified biologist, in cooperation with CDFW and USFWS, shall determine a no-work buffer zone to ensure that construction activities would not result in disturbance to the active nest or cause a breeding bird to abandon its nest. The no-work buffer zone shall remain in effect until the young have fledged or the qualified biologist has determined that the nest is no longer active.

Residual Impact

MM BIO-1 would identify potential nesting spots and provide information for MM BIO-5, which would ensure that construction activities are conducted so as to avoid impacts to nesting birds. MMs BIO-3 and BIO-4 would ensure that riparian habitat used by special-status birds is maintained, revegetated to the extent possible, and created, respectively. With implementation of MM BIO-1 through MM BIO-5, construction impacts to special-status birds would be less than significant.

Impact BIO-4: The Project would result in temporary disturbance to special-status mammals (Construction - less than significant impact; Operation – no impact).

Construction

There are no special-status mammals known to occur or with a high potential to occur in the Project area. Special-status mammals with a moderate potential to occur in the Project area include the pallid bat, western mastiff bat, San Diego black-tailed jackrabbit, San Diego desert woodrat, and American badger. The bats could forage in the Project area but are not expected to roost or breed in the area due to lack of suitable habitat. Impacts on foraging would be less than significant due to the relatively small area and short duration of construction activities as well as availability of other foraging areas nearby. Few individuals of the jackrabbit, woodrat, and badger are expected to use the Project area, and these mobile species are expected to avoid the construction area, resulting in less than significant impacts.

Operation

Project operations would remain unchanged from current operations; therefore, operation of the Project would have no impact on special-status mammals.

Impact BIO-5: The Project would result in disturbance to special-status amphibians and reptiles (Construction – significant but mitigable to less than significant impact; Operation – no impact).

Construction

No State or Federally endangered or threatened amphibians are known to occur or have moderate or high potential to occur in the Project area or vicinity. Four CSSC reptile species are known to occur (coastal whiptail, southern western pond turtle, Blainville's horned lizard, and two-striped garter snake) and three have moderate potential to occur (Western spadefoot, California glossy snake, and coast patch-nosed snake) in the Project area. Of these species, the western pond turtle and two-striped garter snake are highly aquatic, and therefore could be significantly impacted by loss of habitat associated with the abandonment of a portion of the existing lower Piru Creek channel. One Federally listed amphibian, arroyo toad, occurred historically in the Project area below Santa Felicia Dam, but surveys conducted during the relicensing of the Santa Felicia Hydroelectric Project did not find this species in the Project area and, based on its habitat requirements, it has a low potential to occur in the Project area (Sandburg 2004). UWCD currently implements measures described in their *Arroyo Toad Protection Plan* and *Herpetological Monitoring Plan* to identify activities in the spillway ponds that could impact these species,

conducts annual monitoring, and removes invasive species from these species' habitats. Impacts to the coastal whiptail, Blainville's horned lizard, western spadefoot, and coast patch-nosed snake from dewatering of a portion of the existing lower Piru Creek channel would be less than significant as these species predominantly utilize terrestrial habitats. However, these species would be affected by vegetation clearing, grading, and heavy equipment used during construction. These impacts would be less than significant as only small areas of disturbance would occur (Table 5.5-3), suitable habitat exists in the Project vicinity, and they would likely avoid construction areas.

Significant impacts to special-status species, namely the two-striped garter snake and western pond turtle could occur if they become stranded during the dewatering of the portion of the existing lower Piru Creek release channel situated upstream of the confluence of the newly constructed channel.

The spillway modification component of the Project could also impact water quality in the spillway pools that may contain special-status aquatic species, including the two-striped garter snake and western pond turtle, which have been found in the pools, and the western spadefoot, which uses vernal pools for breeding/egg-laying. Prior to construction, UWCD would obtain coverage under the NPDES General Construction Permit from the LARWQB to comply with Section 402 of the Federal CWA. The permit requires the development and implementation of a stormwater pollution prevention plan (SWPPP), which must identify BMPs to prevent adverse water quality impacts to receiving water bodies from stormwater runoff, including erosion and sedimentation controls, spill prevention measures, hazardous material clean-up, and monitoring and reporting. Implementation of BMPs associated with the NPDES Permit for the Project construction would minimize potential impacts to water quality; therefore, impacts would be less than significant.

Operation

Project operations would remain unchanged from current operations and existing ranges in water levels in Lake Piru Reservoir would remain the same; therefore, operation of the Project would have no impact on special-status amphibian and reptile species.

Mitigation Measures

Impacts to special-status amphibians and reptiles would be mitigated through implementation of MMs BIO-2, BIO-3, and BIO-4 discussed above; in addition, the following measures would be implemented:

MM BIO-6. Conduct pre-construction special-status amphibian and reptile surveys. Prior to construction activities, USFWS protocol-level surveys shall be performed by a qualified biologist for special-status amphibians and reptiles. If special-status species are observed in areas planned for temporary or permanent disturbance, UWCD shall develop a plan to avoid impacts (MM BIO-2) that is specific to each species. If impacts cannot be avoided, UWCD shall consult with CDFW and/or USFWS in accordance with the State and Federal ESA. Any special status species observed on the project site be recorded on a CNDDDB field data sheet and submitted to the CDFW for inclusion into the CNDDDB.

MM BIO-7. Amphibian and reptile relocation during dewatering of the portion of lower Piru Creek that will be abandoned. A relocation plan shall be prepared prior to any dewatering or adjustments in flows to ensure all aquatic wildlife can be successfully removed from harm's way. In order to prevent stranding, a team of qualified biologists shall attempt to remove all native aquatic species from the affected reach prior to, during, and following dewatering of the portion of lower Piru Creek that will be abandoned. All native species would be relocated to a predetermined location with sufficient habitat features for each species including, but not limited to, instream cover, appropriate dissolved oxygen concentration, and temperature.

Residual Impact

The loss of aquatic habitat in the existing release channel would be replaced by new aquatic and riparian habitat along the newly constructed outlet works release channel through MM BIO-4. MM BIO-2 and MM

BIO-3 would ensure that impacts to special-status species are minimized during construction and habitat is restored following construction, respectively. MM BIO-6 would prevent stranding of species during outlet works channel dewatering. Implementation of these mitigation measures would ensure that construction impacts to special-status species are less than significant.

Impact BIO-6: Project relocation of the outlet works would impact special-status fish species and their critical habitat (Construction - significant but mitigable to less than significant impact; Operation – no impact).

Construction

Relocation of the existing outlet works system from the right abutment to the left abutment would result in the dewatering of between 480-feet and 1,200-feet of existing channel in lower Piru Creek (depending on the final design), which is designated critical habitat for southern California steelhead. Thus, the relocation of the outlet works would remove critical habitat, resulting in a significant impact to the critical habitat, prior to the implementation of mitigation (discussed below).

Following completion of the new outlet works system; water releases from Santa Felicia Dam would be shifted from the existing outlet works to the new outlet works. During this transition, the portion of the existing lower Piru Creek release channel situated upstream of the confluence of the newly constructed channel would be dewatered. If special-status fish, including Santa Ana sucker and Arroyo chub, are present in the creek at the time of dewatering, this activity could result in significant impacts to special status fish due to stranding.

Operation

Project operations would remain unchanged from current operations; therefore, operation of the Project would have no impact on special-status fish or their critical habitat.

Mitigation Measures

In addition to MM BIO-4, the following mitigation measure would be implemented:

MM BIO-8. Fish relocation during dewatering of the portion of lower Piru Creek that will be abandoned. A relocation plan shall be prepared prior to any dewatering or adjustments in flows to ensure all aquatic wildlife can be successfully removed from harm's way. A team of qualified biologists shall attempt to remove all native aquatic species from the affected reach at the minimum release flow of 7 cfs utilizing seine nets and/or electrofishing techniques prior to dewatering to prevent potential stranding impacts. All monitors and biologists shall have current scientific collection permits necessary to handle any wildlife encountered during Project-related activities. After these initial collection activities, releases from Santa Felicia Dam shall be reduced by no more than 1 cfs per hour until a total of 1 cfs is remaining in the affected reach. The team of biologists shall be on-site monitoring the reduction in flows. Once flows in the reach are at 1 cfs, the team of biologists shall once again attempt to remove the remaining native aquatic species from the affected reach within the reduced wetted habitat utilizing seine nets and/or electrofishing techniques. Following these activities, the affected reach would be dewatered and all remaining native aquatic species, if present, would be captured. During the removal activities, all native species shall be relocated to a predetermined location with sufficient habitat features for each species including, but not limited to, instream cover, appropriate dissolved oxygen concentration, and temperature.

Residual Impact

Abandonment of the existing outlet works release channel would be mitigated by the creation of new aquatic habitat via the creation of a new channel from the newly constructed outlet works to lower Piru Creek (MM BIO-4). The potential for fish stranding would be mitigated through MM BIO-7. With implementation of these mitigation measures, impacts to special-status fish due to outlet works relocation would be less than significant.

Impact BIO-7: Project relocation of the outlet works would affect special-status fish species due to impaired water quality (Construction - significant but mitigable to less than significant impact; Operation – no impact).

Construction

Following completion of the new outlet works system; water releases from Santa Felicia Dam would be shifted from the existing outlet works to the new outlet works. The initial watering of the channel connecting the new outlet works system to the lower Piru Creek channel could temporarily result in degraded water quality (e.g., high turbidity) in the channel and downstream. These initial flows could cause temporary instream and lateral scour, flushing sediment and debris through the channel to downstream habitats, resulting in a significant impact to special-status fish species, such as Santa Ana sucker and Arroyo chub.

Operation

Project operations would remain unchanged from current operations; therefore, operation of the Project would have no water quality-related impacts on special-status fish.

Mitigation Measures

MM BIO-9. Implement turbidity controls. Releases from the new outlet works shall be increased by no more than 1 cfs per hour until the minimum required habitat water release is achieved. To ensure aquatic species do not enter the new channel as the flows are being ramped-up, a temporary block net shall be placed downstream of its confluence with the lower Piru Creek channel. A biological monitor shall be present to determine if any aquatic species have navigated the block net and entered the channel. The monitor shall survey for any isolated or stranded aquatic species several times a day while the block net is in place. Turbidity shall be measured in the newly constructed channel as well as downstream in lower Piru Creek during the first 24 hours of the initial releases. When turbidity levels in the new channel do not exceed turbidity levels at the downstream end of the new channel by more than 20%, the block net may be removed to allow aquatic species to disperse upstream into the new channel.

Residual Impacts

The proposed release rates, monitoring, and exclusion of aquatic species from the entering the newly constructed channel until turbidity levels meet acceptable standards as implemented in MM BIO-9 would result in less than significant water quality impacts to special-status fish species.

Impact BIO-8: Project construction would impact jurisdictional wetland and waters resources (Construction – significant but mitigable to less than significant impact; Operation – no impact).

Construction

Based on observations during the preliminary reconnaissance surveys of the Project area, the Project would have temporary and permanent impacts on jurisdictional Waters of the US and Waters of the State. These waters are both vegetated and unvegetated, but because the source of the hydrology is lacustrine or riverine, they would be considered jurisdictional waters. It is assumed in this analysis that the concrete portion of the spillway would not be considered jurisdictional.

Abandonment of the existing intake structure and construction of the new inlet structure would occur within the OHWM of Lake Piru Reservoir. Temporary access roads would also be constructed as needed to allow access for construction of the intake facility and tunnel and could impact the un-named ephemeral drainage adjacent to the left abutment of Santa Felicia Dam and Lake Piru Reservoir. Temporary access roads constructed for access to the new downstream facilities as well as construction of the downstream facilities themselves could impact lower Piru Creek. A temporary bridge would be placed across lower Piru Creek to allow heavy construction equipment to travel to the downstream, left side of the dam. These construction activities could impact Waters of the US or State or wetlands by

increasing the potential for hazardous material spills, erosion, and sedimentation. Implementation of NPDES permit BMPs, including adherence to measures outlined in a SWPPP as discussed in Section 5.10, would ensure potential impacts are minimized and, therefore, less than significant.

Relocation of the outlet works system would result in the dewatering of between 480-feet and 1,200-feet of existing channel in lower Piru Creek (depending on the final design), resulting in a permanent loss of waters and any wetlands associated with the channel. However, in accordance with Section 404 of the Clean Water Act and the California FGC, prior to implementation, UWCD would obtain a Section 404 permit and Streambed Alteration Agreement, both of which would include required compensatory mitigation (most likely in the form of MM BIO-4, Design and Construct a Geomorphically Stable Channel connecting the New Outlet Works Release Point to the Main Lower Piru Creek Channel). Therefore, no additional mitigation is required.

Under the spillway widening option, realigning the existing access road, demolishing the old existing bridge, and constructing a new bridge crossing the spillway channel could result in temporary impacts on waters associated with the spillway channel.

Operation

Project operations would remain unchanged from current operations; therefore, operation of the Project would have no impact on water and wetland resources.

Mitigation Measures

MM BIO-4 would be implemented to mitigate potential temporary impacts to wetlands and Waters of the US.

Residual Impact

The loss of the existing outlet works channel would be mitigated by MM BIO-4 (creation of a new channel from the new outlet works system to lower Piru Creek and associated wetlands).

Impact BIO-9: The Project would temporarily disturb wildlife movement and nursery sites (Construction - less than significant; Operation – no impact).

Construction

Lower Piru Creek and the Santa Felicia Dam spillway channel represent wildlife corridors within the Project area. However, Santa Felicia Dam and its associated infrastructure currently create a barrier to some wildlife (primarily non-avian terrestrial species) movement. While construction of the Project may temporarily cause an additional disruption to local wildlife movements, the impact would be less than significant due to the limited spatial and temporal impacts from construction and lack of current movement corridors through this area.

The water level of Lake Piru Reservoir would be temporarily lowered to an elevation of 950 feet msl (or lower) during Project construction. The duration of low water conditions would be approximately 48 months. Therefore, lowering of the water level of Lake Piru Reservoir would temporarily reduce the aquatic habitat in the lake, particularly shallow water spawning and nursery sites for largemouth bass, crappie and other sunfishes (*Centrarchidae*). No additional barriers to migration or dispersal of aquatic species that do not already exist in lower Piru Creek will occur during construction. Releases from Santa Felicia Dam would not be altered during construction, thus aquatic spawning habitats, including those for *O. mykiss* would not be impacted during construction activities. Accordingly, project construction impacts on aquatic wildlife corridors and nursery sites would be less than significant.

Operation

During Project operation, the continued presence of the barrier caused by the dam would remain unchanged and there would be no changes from existing operation and maintenance; therefore, there would be no impact to wildlife corridors or nurseries.

Impact BIO-10: The Project would be consistent with local policies and ordinances protecting biological resources (Construction - less than significant impact, Operation – no impact).

Construction

Policies relevant to biological resources included in the Ventura County General Plan (Ventura County 2016a) and the Piru Area Plan (Ventura County 2011) are listed in Section 5.5.3.3.

As discussed above for Impacts BIO-1 through BIO-9, the Project could result in potential impacts to special-status species and their habitats, sensitive plant communities, and wetlands. The Project would also occur within 300 feet of lakes and perennial streams and within 100 feet of potential wetlands. However, Project activities would be conducted in accordance with applicable laws and regulations, and necessary permits and consultations would be conducted. Further, because the purpose of the Project is to improve dam safety, the loss of native trees would not constitute a violation of the Ventura County Tree Protection Ordinance. Therefore, construction impacts associated with local policies and ordinances would be less than significant.

Operation

Operations would remain unchanged from the present, and license conditions intended to preserve and protect significant biological resources in the Project area would remain in effect. Therefore, there would be no impact on local policies and ordinances protecting biological resources.

5.5.4.3 Labyrinth Alternative

Operation of this alternative would be the same as that for the Project. Although the amount of concrete required is greater and the construction has a longer duration, the construction footprint and construction methods for the Labyrinth Alternative would be similar to the Project. Indirect impacts from construction activities would be mitigated in the same fashion as discussed above; however, the construction activities and the implementation of applicable mitigation measures would be longer.

5.5.4.4 No Project Alternative

Under the No Project Alternative, there would be no improvements at Santa Felicia Dam, its spillway, or its outlet works system. The Santa Felicia Dam Spillway would continue to have a conveyance capacity less than the established regulatory IDF. As such, there would be no direct impacts to biological resources.

5.6 Cultural Resources

This section discusses the potential impacts on cultural resources that could result from Project implementation. Cultural resources may include archaeological resources such as Native American occupation sites and artifacts, historic-era buildings and structures, and places used for traditional Native American observances or those of special cultural significance. These materials can be found at many locations on the landscape and, along with prehistoric and historic human remains and associated grave-goods, are protected under various regulatory frameworks including CEQA. Under CEQA, paleontological resources are also considered as part of the cultural resources analysis. Paleontological resources are fossilized remains, traces, or imprints of organisms, preserved in or on the earth's crust, that are of paleontological interest and that provide information about the history of life on earth.

Table 5.6-1 summarizes the impacts on cultural resources that would result from implementation of the Project and alternatives.

Table 5.6-1 Summary of Impacts on Cultural Resources

Impact	Project	Labyrinth Alternative	No Project Alternative	Mitigation Measures
Impact CUL-1: Project construction would alter the spillway and outlet works of Santa Felicia Dam, which has been recommended eligible for listing on the CRHR.	Construction – L/Operation - O	Construction – L/Operation - O	Operation - O	None required
Impact CUL-2: Project construction could result in the destruction of or damage to presently undocumented cultural resources.	Construction – S/Operation - O	Construction - S/Operation - O	Operation - O	MM CUL-1: Follow inadvertent discovery procedures.
Impact CUL-3: Project ground-disturbing activities could encounter presently undocumented human remains.	Construction – L/Operation - O	Construction - L/Operation - O	Operation - O	None required
Impact CUL-4: Project ground-disturbing activities could encounter unique paleontological resources.	Construction - S/Operation - O	Construction - S/Operation - O	Operation - O	MM CUL-2: Follow procedures for encountering fossil remains.

Note:

- O = No Impact
- L = Less than Significant Impact
- S = Significant Impact, but Mitigable to Less than Significant
- U = Significant Unavoidable Impact
- B = Beneficial Impact

5.6.1 Area of Potential Effects

The Project's Area of Potential Effects (APE) (or "Project site") is bounded on the south, west, and east by the property lines of the present-day 6,000-acre Rancho Temescal. The APE extends to the north to include Santa Felicia Dam. The APE encompasses an area measuring approximately 73 acres where proposed construction activities would occur. The vertical APE (the depth to which ground disturbances would take place) varies across the Project site. Ground-disturbing activities would include the construction of a new outlet works system (including a new intake structure, tunnel, and release facilities),

enlargement of the current spillway, the construction of a new bridge and access road, and the raising of the dam crest. The vertical APE would include depths of as little as several inches in the proposed staging areas where little or no grading or excavation would occur. More extensive ground disturbance would occur in association with the new tunnel (which would extend up to 150 feet below the ground surface), the spillway expansion area (up to 13 feet below the present-day ground surface), and at the location of the new bridge footings and access road (up to approximately 18 feet primarily on steep slopes).

5.6.2 Methodology

The information presented here is based on previous cultural resources investigations in the Project vicinity, a review of historical maps and photographs, archival research, record searches at South Central Coastal Information Center (SCCIC) of the California Historical Resources Information Center at California State University, Fullerton and University of California Museum of Paleontology (UCMP), and an archaeological/built environment survey.

5.6.2.1 Records Search and Literature Review

To determine whether any previously documented cultural sites, features, or artifacts were present within or near the Project site, a records search of the archival resources was conducted at the SCCIC. The search area consisted of the Project site and a 0.25-mile buffer. The records search included, but was not necessarily restricted to, the following sources:

- > Records of previously documented sites;
- > Reports of previous studies;
- > California Historical Landmarks;
- > National Register of Historic Places;
- > California Register of Historical Resources;
- > Office of Historic Preservation Historic Properties Directory;
- > General Land Office plat maps showing the study area; and
- > US Geological Survey and other historical mapping.

A search of the UCMP online database also was conducted to identify any potentially significant paleontological resources at or adjacent to the Project site.

5.6.2.2 Native American Community Outreach

On March 1, 2017, a request was submitted to the Native American Heritage Commission (NAHC) for contact information for appropriate Native American tribal organizations and individuals who might have an interest in or concerns with the Project. The NAHC responded on March 6, 2017 with a list of regional Native American contacts. On March 31, 2017, UWCD sent letters to each of the individuals listed below inquiring if they had any knowledge of cultural resources or values in the area and if they had any concerns with the proposed Project.

On July 12, 2017, an additional letter was sent to the NAHC for Section 106 compliance purposes requesting a search of the NAHC Sacred Lands File and an additional list of potentially interested Native American representatives and groups. The list of tribes (below) was the same as that provided for CEQA purposes, and the Sacred Lands File search indicated that no culturally sensitive properties were known to be located within or near the Project site.

- > Kenneth Kahn, Tribal Chair – Santa Ynez Band of Chumash Indians

- > Julie Lynn Tumamait-Stenslie, Tribal Chair – Barbareño/Ventureño Band of Mission Indians
- > Patrick Tumamait - Barbareño/Ventureño Band of Mission Indians
- > Eleanor Arrellanes - Barbareño/Ventureño Band of Mission Indians
- > Raudel Joe Banuealos, Jr. - Barbareño/Ventureño Band of Mission Indians
- > Mia Lopez, Tribal Chair – Coastal Band of the Chumash Nation

In addition to the above tribal contact, UWCD sent a letter on September 25, 2017 to the Fernandeño Tataviam Band of Mission Indians following receipt of a request for information on an unrelated project within the Lake Piru Recreation Area.

On August 2, 2017, Mr. Freddie Romero, Cultural Resources Coordinator of the Santa Ynez Band, provided information on the APE and expressed the Band's interest in the Project. Mr. Romero stated that the APE is outside his tribe's traditional territory, and they do not have any concerns with the Project or any information relevant to cultural resources in or near the APE. Mr. Romero also stated that it was unlikely that the Coastal Band of the Chumash Nation would seek to have involvement in the Project but suggested that additional outreach to Ms. Julie Lynn Tumamait-Stenslie be undertaken because the Barbareño/Ventureño Band might have an interest in cultural resources potentially located in the area. UWCD is continuing to engage the Native American community for the Project.

In addition to the letters, UWCD also followed up with emails to Kenneth Kahn, Julie Lynn Tumamait-Stenslie and Mia Lopez on April 3, 2017 and to the Fernandeno Tataviam Band of Mission Indians on October 3, 2017 per information provided by the NAHC. No responses have been received at the time of publication of this EIR.

5.6.2.3 Field Survey

The Project site was subjected to a pedestrian survey utilizing transects spaced at intervals not exceeding 15 meters. Due to the irregular nature of portions of the Project site and variable ground surfaces and contours, most transects were spaced far closer together, or variable survey methods were employed as necessary, maximizing the survey coverage. Areas of exposed mineral soil such as rodent burrows and erosional surfaces were examined closely for possible indications of subsurface traces of prehistoric and/or historic-era deposits and activities.

Built environment documentation for this Project included intensive survey of the Project site. All built environment features and components (Santa Felicia Dam) documented during the survey were photo documented and recorded in the field. Photo documentation of the dam included overviews of the elements and any pertinent details. In addition, the survey documented contextual views of the dam in order to properly assess its setting.

5.6.3 Setting

The following section provides a succinct overview of Project site's prehistory, ethnographic setting, and historic-period background to provide a context for the assessment of cultural resources documented at the Project site and vicinity. This section also reviews cultural sites and features documented at the Project site and vicinity, and summarizes the results of archival research, Native American community outreach, and an archaeological and built environment survey.

5.6.3.1 Regional Prehistory

While people are known to have inhabited Southern California beginning at least 13,000 years before the present day (BP) (Arnold et al. 2004), the first evidence of human occupation in the general vicinity of the Project site dates to at least 7,000 years BP, and the first occupation of the region dates to at least 9,000 BP. These occupations are associated with a period known as the Millingstone Cultural Horizon (7,000-

4,000 BP) (McIntyre 1990; Wallace 1955). Departing from earlier subsistence strategies that may have focused on the nomadic hunting of big game, Millingstone populations established more stable population centers. Settlements were located primarily on the coast and in the vicinity of estuaries, lagoons, lakes, streams, and marshes where a variety of resources, including seeds, fish, shellfish, small mammals, and birds, were exploited. Early Millingstone occupations are typically identified by the presence of handstones (“manos”) and millingstones (“metates”) in archaeological assemblages, while those Millingstone occupations dating later than 5,000 BP typically contain mortars and pestles, suggesting an increased exploitation of new food sources, such as acorns and starchy tubers.

By 3,500 BP, the Middle Period began, continuing until approximately 1,500 BP. Unlike the earlier Millingstone assemblages, this period is well represented in the Santa Clara River Valley region with major site complexes located along the Piru Creek drainage and just to the east in the Castaic drainage. There appears to be a very high degree of interregional variation with relation to village structure during this time (Moratto 1984). Special use sites focusing on resource procurement and production appear in the archaeological record and were probably commonly occupied by small family units. Two mortuaries from this time period indicate that some form of ranking may have occurred. However, the type of burial practice in use (cremation) limits the number of demographic indicators necessary to clearly suggest hereditary ranking (Wessel and McIntyre 1985). During the Middle Period, chlorite schist disk beads, which commonly occur in mortuaries and in the burial practice of cremation, suggest that the population at this time was ancestral to the Shoshonean groups, including the Tataviam, and Gabrielino, which occupied the APE and immediate vicinity at the time of the Spanish arrival.

The Late Period lasted from about 1,500 BP until approximately 1769 when the Spanish arrived in the Ventura County region. This time period saw significant changes in the social and economic systems of the people occupying the Project vicinity. The number of sites in the area increased, which may have been the result of a population increase. Leonard (1971) discusses the Late Period as a time when there is a greater number of more specialized sites in terms of their location and function, and an amplification of all aspects of the cultural system. Other Late Period cultural features, such as pictograph styles, may suggest that two distinctive ethnic groups coexisted in the APE region. Existing information points toward a culture more like the Chumash than Shoshonean by the end of the Late Period. However, it has not been determined whether the recorded differences are due to population movements or the absorption of one economic-social system (Shoshonean) by another (Chumash) (Moratto 1984).

5.6.3.2 Ethnography

Although several Native American groups retain long-standing cultural ties to the region surrounding the Project site, the Tataviam and the Gabrielino Tongva appear to be most closely linked to the immediate area around Lake Piru Reservoir. In general, ethnographically delineated tribal boundaries were often fluid, and nearby groups such as the Ventureño Chumash (immediately to the west) and the Emigdiano Chumash to the north likely resided in or at least passed through the Project site and/or surrounding area on a regular basis. However, historical observations, records, and linguistic analyses indicate that during the ethnographic period, it was primarily the Tataviam and possibly the Gabrielino Tongva and their ancestors who most intensively occupied the Piru Creek area north of the Santa Clara River.

5.6.3.2.1 Tataviam

Due to a general lack of early historic-period accounts, little is known about the late prehistoric and ethnographic-era Tataviam. The name “Tataviam” may be derived from a Kitanemuk word roughly translated as “people of the south-facing slope” due to their settlements typically being situated on south-facing mountain slopes (King and Blackburn 1978). Linguistic accounts indicate the Tataviam spoke a language that was part of the Takic branch of the Uto-Aztecan language family (King and Blackburn 1978). The language was related to that spoken by the nearby Gabrielino-Tongva and Kitanemuk tribes. Tataviam territory was concentrated along the upper reaches of the Santa Clara River drainage between the San Fernando Valley on the south and Pastoria Creek in the Tehachapi Mountains to the north. Their

territory also included the eastern portion of Piru Creek and the southern slopes of Sawmill and Liebre Mountains and extended into the southern end of the Antelope Valley (King and Blackburn 1978). Tataviam territory was bounded by lands traditionally occupied by the Gabrielino-Tongva to the south, the Serrano to the east, the Kitanemuk to the northeast, the Emigdiano Chumash to the north, and the Ventureño Chumash to the west.

Tataviam settlements varied in size from larger population centers with as many as 200 individuals to smaller villages, home to no more than a few families (King and Blackburn 1978). At the time of Spanish contact, the Tataviam population is estimated to have been less than 1,000. According to historical records, a number of Tataviam settlements were located along Piru Creek where Lake Piru Reservoir is now located or in areas immediately to the south or north of the APE. These sites included Akakavaya, Etseng, Huyung, and Kuvung (King and Blackburn 1978). Akakavaya was probably the location of the main settlement in the area. The smaller villages, Etseng, Huyung, and Kuvung, were originally documented by Kroeber in 1915 based at least in part on period mission records and diaries. However, none of these locations has been documented archaeologically.

5.6.3.2.2 Gabrielino-Tongva

The Gabrielino-Tongva are reported to have been second only to the Chumash in terms of population size and regional influence (Bean and Smith 1978). Gabrielino settlements generally ranged from 50 to 100 inhabitants, although larger settlements may have existed. During the pre-contact period, the Gabrielino-Tongva are estimated to have had a population numbering around 5,000 (Kroeber 1925). Villages are reported to have been the most abundant in the San Fernando Valley and along the coast (Gumprecht 2001). Although no Gabrielino villages have been documented in or adjacent to the APE, several were recorded to the south. These included Pasheeknga (or Pasknga), Achooykomenga, Pakooynga, and Wiqanga, and Yaanga. The village of Pasheeknga was located near the site where Mission San Fernando Rey de España was established, about 20 miles southeast of the APE (McCawley 1996). Achooykomenga and Pakooynga were located nearby, although their precise locations are unknown. Wiqanga was located in Cañada de las Tunas, at the west end of the Verdugo Hills about 30 miles southeast of the Project site (McCawley 1996).

Coming ashore on Santa Catalina Island in October of 1542, Juan Rodriguez Cabrillo was the first European to make contact with the Gabrielino-Tongva. Over 100 years later, the 1769 expedition of Gaspar de Portolá also passed through Gabrielino-Tongva territory (Bean and Smith 1978). However, as was common following sustained Euro-American contact, the Gabrielino-Tongva suffered severe depopulation, and their traditional culture was radically altered.

5.6.3.3 Historic Context

5.6.3.3.1 Spanish Period (1769-1821)

Although Spanish explorers made brief visits to the region in 1542 and 1602, sustained contact with Europeans did not commence until the onset of the Spanish Period. In 1769, Gaspar de Portolá led an expedition from San Diego to San Francisco Bay (McCawley 1996), crossed over the slopes of the Transverse Range and entered the interface of the two valleys near Castaic Junction, just to the southeast of the Project site. The expedition turned west and traveled along the Santa Clara River Valley to the Pacific Coast and continued north. De Portolá's expedition was part of the late 18th century Spanish development of missions in California and the forced relocation and confinement of native peoples. Three missions were located in the region: Mission San Gabriel Arcángel, founded in 1771; Mission San Fernando Rey de España, founded in 1797; and Mission San Buenaventura, founded in 1782. Gabrielino-Tongva Indians were primarily sent to Mission San Gabriel to be baptized, although some were also baptized at Mission San Fernando.

In an effort to promote Spanish settlement of Alta California and solidify Spain's political and economic hold over the region, several large land concessions were established in the region surrounding the Project site between 1784 and 1821. However, unless certain requirements were met, Spain retained title to the land (State Lands Commission 1982). Although no Spanish grants were established in or within the immediate vicinity of the Project site, the later Mexican government accelerated the granting of ranchos, including one that encompassed the entire Project site, Rancho Temescal.

5.6.3.3.2 Mexican Period (1821-1848)

The Mexican Period began when Mexico won its independence from Spain in 1821. Mexico continued to promote settlement of California with the issuance of land grants. In 1833, Mexico began the process of secularizing the missions, reclaiming the majority of mission lands and redistributing them as land grants. According to the terms of the Secularization Law of 1833 and regulations of 1834, at least a portion of the lands would be returned to the native populations, but this did not always occur (Milliken et al. 2009). The Project site is contained within the bounds of the 13,339-acre Rancho Temescal, which was granted to Francisco Lopez and José Arellanes in 1842 but was later transferred to Ramon de la Cuesta and Francisco Gonzales Ciminio and patented to de la Cuesta in 1871 (Willey 1886; Worden 2012). The rancho extended from the confluence of Piru Creek and the Santa Clara River, included present-day Lake Piru Reservoir and the town of Piru and extended to the northeast near present-day Interstate 5. Ygnacio del Valle later purchased Rancho Temescal to expand his agricultural endeavors (Triem and Stone 1996), and the del Valles family sold the rancho in 1887 to David C. Cook, the founder of the town of Piru (Rancho Temescal 2018).

Ranchos established throughout California during the Mexican period focused mainly on cattle ranching, and hides and tallow from cattle became a major export for Californios (native Hispanic Californians). Rancho owners typically became wealthy and prominent members of Alta California society (Pitt 1994; Starr 2007).

5.6.3.3.3 American Period (1848-present)

Stemming from a territorial dispute between the United States and Mexico, the Mexican-American War broke out in 1846. Mexican forces were eventually defeated the following year and Mexico ceded California, present-day Nevada and Utah, and parts of New Mexico, Arizona, Colorado, and Wyoming to the United States as part of the Treaty of Guadalupe Hidalgo in 1848. While the treaty recognized the right of Mexican citizens to retain ownership of land granted to them by Spanish or Mexican authorities, the claimant was required to prove their right to the land before a United States patent was issued. The process was lengthy and generally resulted in the claimant losing at least a portion of their land to attorney's fees and other costs associated with proving ownership (Starr 2007).

When the discovery of gold in Northern California was announced in 1848, an enormous influx of people from other parts of North America and throughout the world flooded into California. The increased population provided an additional outlet for the Californios' cattle. As demand increased, the price of beef skyrocketed and Californios reaped the benefits. However, a devastating flood in 1861, followed by droughts in 1862 and 1864, led to a rapid decline of the cattle industry (Dinkelspiel 2008; McWilliams 1949). This decline, coupled with the burden of proving ownership of their lands, caused many Californios to lose their lands during this period (McWilliams 1949). Former ranchos were subsequently subdivided and sold for agriculture and residential settlement. For example, Ygnacio del Valle, the owner of Rancho Camulos (located to the east of Piru), was forced to sell of large portions of his holdings in 1865 due to the alternating flood and drought cycles, which rendered much of his acreage too unpredictable for sustaining an economically viable ranch.

The lands that Ygnacio del Valle sold in 1865 were purchased by the Philadelphia and California Petroleum Company, which began drilling for oil. Unsuccessful in its efforts to locate oil, the company sold the property along with the adjacent Rancho San Francisco in 1875 to Henry Mayo Newhall, who

raised cattle and cultivated wheat and barley on the land (McIntyre 1990). Newhall located his ranching headquarters adjacent to the old Estancia de San Francisco Xavier. Upon Newhall's death in 1883, the rancho was passed on to his descendants, who incorporated the Newhall Land and Farming Company and used much of the acreage in Rancho San Francisco, including lands just to the south and east of the APE, for agricultural purposes, primarily the cultivation of citrus trees (Newhall Foundation 2011).

5.6.3.4 United Water Conservation District and Santa Felicia Dam

UWCD was organized in 1950 with the purpose of developing superior methods of capturing stormwater to further the water conservation efforts of the Santa Clara River Valley. As established, the district boundaries stretched from the valley west to the coastal plain. Studies conducted by the State and County, as well as the previously established Santa Clara Water Conservation District, identified that the construction of dams would provide the best method for conserving water. By December 1952, UWCD absorbed the holdings of Santa Clara Water Conservation District, including its diversions and water-spreading systems at Saticoy, Piru, and Santa Paula, and the Santa Clara Water Conservation District was soon dissolved.

Construction of Santa Felicia Dam, funded by a 1953 bond measure, began in April 1954 and concluded December 1955. The dam was designed by the engineering design consultant Bechtel Corporation and over 30 UWCD engineers, designers, surveyors, geologists and inspectors overseen by UWCD's first General Manager, Julian Hinds. Mr. Hinds previously served as general manager for the Metropolitan Water District of Southern California where he was a key figure in bringing water to Southern California via the Colorado River. Construction of the earthfill dam and its concrete spillway was led by D. & H. Construction Company, Macco Corporation, and M.H. Hasler Construction Company, a joint venture of three Sacramento, California-based construction companies. The dam required over 3,800,000 cubic yards of placed and dumped earth fill, excavated from sources near the dam site. Upon its completion, the dam had a crest length of approximately 1,200 feet, and stood approximately 200 feet above the original streambed, wedged between the bedrock hillsides.

5.6.3.5 Documented Historic and Prehistoric Resources

The SCCIC record search and additional archival research indicates that no previously recorded cultural resources are present within the Project site or within the 0.25-mile records search buffer. Several previous cultural resources investigations conducted in the vicinity of the Project site documented no prehistoric or historic-era resources in or near where the Project would occur.

As noted above, UWCD contacted the NAHC requesting a search of the Sacred Lands File and a list of appropriate Native American tribal contacts who might have an interest in or concerns with UWCD's proposed Project. No culturally sensitive properties have been recorded in or near the Project site, and UWCD will continue to coordinate with the contacted tribes through the CEQA process (following publication of the Draft EIR and prior to preparing the Record of Decision).

No archaeological sites, features, or artifacts were documented during a Project site survey conducted by an archaeologist and architectural historian. One built environment resource, Santa Felicia Dam, was recorded.

Santa Felicia Dam consists of a rolled earth and gravel fill embankment structure with an impervious clay core and a concrete spillway. The dam is located at the south end of Lake Piru Reservoir, which impounds water from Piru Creek, has a capacity of 81,985 acre-feet, and serves as the principal component of UWCD's larger system of groundwater replenishment. The dam has a crest length of 1,260 feet, crest width of 30 feet, and stands 213 feet above the original streambed. Large, aggregate rock covers the north (upstream) side and portions of the south (downstream) side of the dam face. The dam crest is paved, with a three-foot-high concrete block parapet wall on the north side and a metal guardrail on its south side. Modern light fixtures extend from the metal guardrail along the dam crest, lighting the downstream side of the dam.

A large, reinforced concrete spillway is located on a bedrock saddle near the west abutment of the dam. The ungated spillway has an ogee crest built on a 400-foot-radius circular arc, and measures 475 feet long. Water is discharged into a 570-foot-long funnel-shaped chute with a concrete slab floor and vertical concrete walls. Concrete patchwork is evident on the concrete slab floor and spillway face. Stacked concrete blocks, added in 1973, and a chain-link metal fence are located along the top of the spillway walls. Concrete gutters border the east and west sides of the spillway. A short concrete block staircase provides access to the spillway face and upstream side of the dam near the west end of the parapet dam wall.

A single-lane post-tensioned bridge crosses the spillway near its lower end, providing access to the dam. The bridge consists of three pre-stressed concrete spans, with a 122-foot-long central span, and rests on large concrete abutments. A metal guardrail and chain-link fence frame the concrete deck.

The original outlet structure, located about 600 feet upstream from the axis of the dam, was altered from its original design in 1977 when a 29-foot concrete extension with a conical trash rack was added to its peak. Water passes through the upstream 66-inch concrete pressure conduit to the downstream 60-inch-diameter welded steel pipe approximately 1,050 feet through the dam to its downstream end where water is discharged through two 36-inch hollow cone valves set in a concrete chamber on the west side of the dam. The control building is a small, reinforced concrete building with a rectangular footprint and a flat roof. Metal double doors provide access into the building on its south side. The windowless building has two small rectangular vents just below the roofline on its north side. A small powerhouse was constructed just southwest of the storage building in 1987. The powerhouse consists of two joined, raised-seam metal buildings.

Santa Felicia Dam appears eligible for listing in the California Register of Historic Resources (CRHR) under Criterion 1 at the local level for its direct association with the development of water conservation efforts in the Santa Clara River Valley. Upon its completion in 1955, the Santa Felicia Dam became the first dam in California constructed specifically for the purpose of groundwater recharge and provided the first reliable source of water for a region whose economy depended largely on agriculture. The development of Santa Felicia Dam allowed for storage and controlled release of water in the late summer and fall months when the Santa Clara River and its tributaries often ran dry, replenishing groundwater supplies and fighting the constant threat of saltwater intrusion.

While the dam has undergone routine maintenance and utilitarian modifications, in addition to the development of a small powerhouse and alteration of the outlet works in the late 1980s, it has remained largely unaltered since construction and retains integrity of location, setting, design, materials, and workmanship. Santa Felicia Dam continues to function as an earthfill dam, storing water for controlled release to replenish groundwater downstream, therefore maintaining its integrity of feeling and association. The dam's significance, coupled with its retention of integrity, appears to qualify it as eligible for listing in the CRHR under Criterion 1.

Per CRHR Criterion 2, there is no evidence that Santa Felicia Dam has important associations with any person or persons who made significant contributions to history at the local, state, or national level. While the dam was designed under the supervision of Julian Hinds, a notable figure in the development of the Colorado River Aqueduct and water conservation in Southern California, the dam was designed late in Hinds' career and his service with UWCD was relatively brief. Hinds is more closely associated with projects developed during his long tenure as chief engineer and general manager of the Metropolitan Water District of Southern California. As such, it does not appear that there is the potential for significant associations in this regard. Consequently, Santa Felicia Dam is recommended not eligible for CRHR listing under Criterion 2.

Per CRHR Criterion 3, Santa Felicia Dam is not an important example of any type, period, or method of construction or engineering design, and it does not represent the important work of a master engineer. Santa Felicia Dam was constructed according to known and common engineering and design methods of

the period using commonplace building materials sourced on site and does not represent any advancement in design or technology. Consequently, Santa Felicia Dam is recommended not eligible for CRHR listing under Criterion 3.

Per CRHR Criterion 4, Santa Felicia Dam is not significant as a source, or likely source, of important information pertaining to history, building materials, construction techniques, or advancement in dam construction design. This type of infrastructure is well documented and is one of thousands of similar earthfill dams throughout California and the nation. Consequently, Santa Felicia Dam is recommended not eligible for CRHR listing under Criterion 4.

5.6.3.6 Paleontological Resources

Bedrock in the dam and reservoir areas consist primarily of sediments assigned to the Monterey Formation, which was deposited during the middle of the Miocene Epoch (GEI 2015b). The Monterey Formation is a vast area of marine deposits rich in fossils that occurs in a large area of California. Paleontological remains that are of particular interest in the formation consist of fossil whales and dolphins, as well as a large numbers of well-preserved crabs. The formation is best-known for the wide varieties of kelps and other large, soft-bodied seaweeds, which are seldom found in other formations. In general, this formation is rated as having “moderate” paleontological importance (Ventura County 2011). A search of the UCMP online database (UCMP 2017) was conducted in order to identify any potentially significant paleontological resources in or adjacent to the Project site. This research indicated that the closest documented paleontological finds were made in Grimes Canyon (approximately 4 miles south of the town of Fillmore) and consisted of the fossils of at least two species of flowering plants (Magnoliopsida, and Pinopsida). Gastropods and bivalves have been found in Bus Canyon, Simi Valley, and in the Simi hills about 14 miles south of the Project site. In addition, mammal remains from the Miocene have been found in Dry Canyon, also about 14 miles south of Santa Felicia Dam. However, the UCMP database does not contain any records of paleontological remains having been found within or in the immediate vicinity of the Project site and no paleontological remains were found during the archaeological survey.

5.6.4 Regulatory Framework

5.6.4.1 Federal

No Federal regulations related to cultural resources apply to the Project.

5.6.4.2 State

5.6.4.2.1 California Environmental Quality Act

The cultural resources provisions of CEQA provide for the documentation and protection of significant prehistoric and historic-era resources. Before the approval of discretionary projects and the commencement of agency undertakings, the potential impacts of the project on archaeological and historical resources must be considered (PRC Sections 21083.2 and 21084.1 and the CEQA Guidelines [CCR Title 14, Section 15064.5]). The significance of an archaeological or historical resource per the CEQA Guidelines is an important consideration in terms of their management. Listing on the CRHR, or eligibility for listing on the CRHR, is the primary consideration in whether or not a resource is subjected to further research and documentation.

The significance of cultural resources is measured against the criteria outlined in the CRHR. Determining the CRHR eligibility of historic and prehistoric sites located within the study area is guided by the specific legal context of the site’s significance as outlined in PRC Sections 21083.2 and 21084.1, and the CEQA Guidelines (CCR Title 14, Section 15064.5). In the CRHR cultural resources are defined as buildings, sites, structures, or objects that may have historical, architectural, archaeological, cultural or scientific importance. A cultural resource may be eligible for listing on the CRHR if it:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. 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
4. Has yielded, or may be likely to yield, information important in prehistory or history.

As a matter of policy, public agencies should avoid damaging effects on historic and archaeological resources, particularly those that are CRHR-eligible. When impacts cannot be avoided, their effects can be mitigated through avoidance during construction phases, incorporation of a site into open space, capping resources with stable fill, deeding a site into a conservation easement, or data recovery through archaeological testing and excavation.

In addition, the State CEQA Guidelines require consideration of unique archaeological sites (Section 15064.5). If an archaeological site does not meet the criteria for inclusion on the CRHR but does meet the definition of a unique archaeological resource as outlined in the PRC (Section 21083.2), it may be treated as a significant historical resource. Treatment options under Section 21083.2 of CEQA include preserving such resources in place in an undisturbed state. Other acceptable methods of mitigation under Section 21083.2 include excavation and curation, or study in place without excavation and curation (if the study finds that the artifacts would not meet one or more of the criteria for defining a "unique archaeological resource").

PRC Section 15064.5(e) of the State CEQA Guidelines also requires that excavation activities stop whenever human remains are uncovered and that the county coroner be called in to assess the remains. If the coroner determines that the remains are those of Native Americans, the NAHC must be contacted within 24 hours. At that time, Section 15064.5(d) CEQA Guidelines directs the lead agency to consult with the appropriate Native Americans as identified by the NAHC and directs the lead agency (or applicant) to develop an agreement with the Native Americans for the treatment and disposition of the remains.

5.6.4.2.2 Assembly Bill 52

Assembly Bill 52 (AB 52) went into effect July 1, 2015 and requires lead agencies to consult with California Native American tribes that have requested formal consultation on a project, either at the onset of the project or when the NOP of an EIR is released. Additional information regarding Assembly Bill 52 and associated consultation is provided in Section 5.18, Tribal Cultural Resources.

5.6.4.3 Local

Although Santa Felicia Dam is located in unincorporated Ventura County, it is exempt from local permit requirements because it is a water storage and power generation facility and regulated by a license issued by FERC under the Federal Powers Act. Therefore, the Project is not subject to the provisions of the Ventura County General Plan. The relevant goals and policies are provided below for informational purposes. The Project is consistent with these goals and policies because the Project site has been surveyed for cultural resources, impacts have been assessed, and appropriate mitigation measures have been identified.

5.6.4.3.1 Ventura County General Plan

Goals

1. Identify, inventory, preserve and protect the paleontological and cultural resources of Ventura County (including archaeological, historical and Native American resources) for their scientific, educational and cultural value.

2. Enhance cooperation with cities, special districts, other appropriate organizations, and private landowners in acknowledging and preserving the County's paleontological and cultural resources.

Policies

1. Discretionary developments shall be assessed for potential paleontological and cultural resource impacts, except when exempt from such requirements by CEQA. Such assessments shall be incorporated into a County-wide paleontological and cultural resource database.
2. Discretionary development shall be designed or redesigned to avoid potential impacts to significant paleontological or cultural resources whenever possible. Unavoidable impacts, whenever possible, shall be reduced to a less than significant level and/or shall be mitigated by extracting maximum recoverable data. Determinations of impacts, significance and mitigation shall be made by qualified archaeological (in consultation with recognized local Native American groups), historical or paleontological consultants, depending on the type of resource in question.
3. Mitigation of significant impacts on cultural or paleontological resources shall follow the Guidelines of the State Office of Historic Preservation, the State Native American Heritage Commission, and shall be performed in consultation with professionals in their respective areas of expertise.
4. Confidentiality regarding locations of archaeological sites throughout the County shall be maintained in order to preserve and protect these resources from vandalism and the unauthorized removal of artifacts.

5.6.5 Impacts and Mitigation Measures

5.6.5.1 *Significance Criteria*

UWCD reviewed Appendix G of the CEQA Guidelines to determine whether the Project would result in significant impacts related to cultural resources. The criteria listed below consider if the Project would:

- a. Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 of the CEQA Guidelines.
- b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5 of the CEQA Guidelines.
- c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.
- d. Disturb any human remains, including those interred outside of formal cemeteries.

No unique geologic features are present at the Project site; therefore, this portion of criterion c is not considered further.

5.6.5.2 *Proposed Project*

Impact CUL-1: The Project would alter the spillway and outlet works of Santa Felicia Dam, which has been recommended eligible for listing on the CRHR (Construction – less than significant/Operation – no impact).

Construction

The Project would modify the outlet works and the spillway, both of which are character-defining features of the dam. The significance of the dam, however, stems from its function (as the first dam and reservoir in California constructed specifically for the purpose of groundwater recharge) and from its direct association with the development of water conservation efforts in the Santa Clara River Valley, rather than from the design of the dam and its components. The Project would not affect the function of the dam;

thus, its historical purpose and integrity would be maintained. Alteration of the outlet works, which were previously altered during the 1980s, and spillway therefore would not affect the dam's eligibility for listing on the CRHR because these features do not contribute to its eligibility. Because the dam's function would remain unchanged, the dam's eligibility for listing on the CRHR would not be affected, and construction impacts would be less than significant.

Operation

Operation of the facility would remain the same as current conditions and the dam's function would remain unchanged; therefore, there would be no impact.

Impact CUL-2: The Project could result in the destruction of or damage to presently undocumented cultural resources (Construction - significant impact but mitigable to less than significant/Operation – no impact).

Construction

Subsurface disturbances during construction could potentially destroy or damage undiscovered prehistoric or historic cultural resources. If these resources were to represent "unique archaeological resources" or "historic resources" as defined by CEQA, a significant impact would occur. The Project is located in a region where significant prehistoric and historic-era cultural resources have been documented. Although no "unique" or "historic" cultural resources (as per CEQA definitions) have been documented on the Project site, there is a potential that unrecorded cultural resources could be unearthed or otherwise discovered during ground-disturbing and construction activities. If such resources were determined to be unique or historic, a significant impact would occur.

Operation

Existing dam operations would not change following Project construction; therefore, there would be no impact to undocumented cultural resources from Project operation.

Mitigation Measures

MM CUL-1: Follow inadvertent discovery procedures. All contractors and earth moving personnel shall be given Worker Environmental Awareness Program (WEAP) training by a qualified cultural resources specialist prior to any ground-disturbing activities to discuss the Project's potential for impacting cultural resources. The training shall inform personnel of the types of artifacts and features that may be encountered, the procedures to be followed if cultural materials are unearthed at the project site, contact information for appropriate Tribal personnel, and the regulatory requirements for the protection of cultural resources. If unrecorded cultural resources are encountered during Project-related ground-disturbing activities, a qualified cultural resources specialist shall be contacted to assess the potential significance of the find. If an inadvertent discovery of cultural materials (e.g., unusual amounts of shell, animal bone, bottle glass, ceramics, structure/building remains) is made during Project-related construction activities, ground disturbances in the area of the find will be halted, and a qualified professional archaeologist will be notified regarding the discovery. The archaeologist will determine whether the resource is potentially significant per the CRHR and develop appropriate mitigation, such as avoidance or data recovery. A Native American Monitor shall be present for implementation of cultural mitigation measures.

Residual Impacts

Implementation of MM CUL-1 would reduce potentially significant impacts resulting from inadvertent damage or destruction of unknown cultural resources during construction to a less than significant level because appropriate procedures would be followed to ensure that any unanticipated cultural resources discovered during Project-related ground-disturbing activities are appropriately handled and documented and that all appropriate parties are contacted and coordinated with in a timely manner, in order to either avoid or minimize impacts on the cultural resources.

Impact CUL-3: The Project could encounter presently undocumented human remains (Construction - less than significant/Operation – no impact).**Construction**

While no evidence for prehistoric or early historic interments was found in the Project site in surface contexts, this does not preclude the existence of buried human remains. Furthermore, human remains are known to occur in the region surrounding the Project site. California law recognizes the need to protect historic-era and Native American human burials, skeletal remains, and items associated with Native American interments from vandalism and inadvertent destruction.

Although all of the areas that will be used for stockpiling and staging were previously disturbed by the original construction of the dam, it is possible that previously unknown buried human remains could be unearthed and damaged or destroyed during excavation activities associated with the proposed Project, such as grading and excavation related to the outlet works tunnel. Damage to or destruction of human remains during project construction or other project-related activities would be considered a significant impact. However, in accordance with the California Health and Safety Code Sections 7050.5 and 7052, if human remains are uncovered during ground-disturbing activities, all such activities in the vicinity of the find would be halted immediately, and UWCD's designated representative would be notified. UWCD's representative would immediately notify the Ventura County Sheriff/Coroner and a qualified professional archaeologist. The Sheriff/Coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or State lands (Health and Safety Code Section 7050.5[b]). If the coroner determines that the remains are those of a Native American, he or she must contact the NAHC by phone within 24 hours of making that determination (Health and Safety Code Section 7050[c]). UWCD's responsibilities for acting upon notification of a discovery of Native American human remains are identified in detail in the California Public Resources Code Section 5097.9. UWCD or its appointed representative and the professional archaeologist would contact the Most Likely Descendent (MLD), as determined by the NAHC, regarding the remains. The MLD, in cooperation with UWCD, would determine the ultimate disposition of the remains. Compliance with these regulatory requirements would ensure impacts are less than significant.

Operation

Existing dam operations would not change following Project construction; therefore, there would be no impact to undocumented human remains from Project operation.

Impact CUL-4: The Project could encounter unique paleontological resources (Construction - significant impact but mitigable to less than significant/Operation – no impact).**Construction**

Fossil remains are considered important and a paleontological resource if they meet the following qualifications: (1) well preserved; (2) identifiable; (3) type/topotypic specimens; (4) age diagnostic; (5) useful in environmental reconstruction; (6) represent rare and/or endemic taxa; (7) represent a diverse assemblage; and/or (8) represent associated marine and non-marine taxa. Vertebrate and megainvertebrate fossils are considered highly important because they are comparatively rare and allow precise age determinations and environmental reconstructions for the strata in which they occur. Microinvertebrate fossils (microfossils) are much more abundant and, for this reason and because of their small size, would not be adversely impacted to the same degree as vertebrate and megainvertebrate fossils (Ventura County 2011).

Although no fossils have been recorded at the site, vertebrate and megainvertebrate marine fossils contained in the Monterey Formation potentially could be present below the current ground surface. Construction would extend to a depth of up to 13 feet where the spillway expansion would be constructed, up to 18 feet at the location of the new bridge footings and access road, and up to 150 feet during tunnel

excavation. Thus, construction activities could potentially encounter and damage or destroy unique paleontological resources, which would be a significant impact. However, based on the geology of the Project site, significant fossil remains are not anticipated to be encountered.

Operation

Existing dam operations would not change following Project construction; therefore, there would be no impact to unique paleontological resources from Project operation.

Mitigation Measures

MM CUL-2: Follow procedures for encountering fossil remains. If fossil remains are found during construction, construction activities must halt in the area of the remains, a paleontological consultant shall be notified, and a site evaluation shall be conducted as necessary to assess the site and determine curation requirements.

Residual Impact

Implementation of MM CUL-2 would reduce the impact associated with the potential discovery of fossil remains to less than significant because a qualified paleontologist would assess the significance of the fossils and determine appropriate curation requirements.

5.6.5.3 Labyrinth Alternative

The Labyrinth Alternative would require more demolition of existing structures and concrete placement than the Project. However, it would have the same impacts as the Project because the same geographic area would be disturbed during construction, and the dam's function would not change during operations, as described in Section 5.6.4.2. The same mitigation measures would apply and reduce impacts in the same manner as described above for the Project. Impacts would be less than significant with mitigation incorporated.

5.6.5.4 No Project Alternative

Under the No Project Alternative, no impacts on cultural resources would occur because no changes would be made to Santa Felicia Dam.

5.7 Geology and Soils

This section analyzes potential impacts of the Project and alternatives on geological resources and soils, as well as geotechnical hazards that may adversely affect the Project and alternatives or that may be amplified by the Project and alternatives. Santa Felicia Dam is located in an area that is potentially susceptible to strong seismic ground-shaking, seismically induced liquefaction, seismically induced landslides, and soil erosion. Impacts relative to erosion/siltation, geomorphology, and flooding are further discussed in Section 5.10, Hydrology and Water Quality.

Table 5.7-1 summarizes the impacts on geological and soil resources that would result from implementation of the Project and alternatives.

Table 5.7-1 Summary of Impacts on Geology and Soils

Impact	Project	Labyrinth Alternative	No Project Alternative	Mitigation Measures
Impact GEO-1: The Project would reduce exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, ground-shaking, liquefaction, or landslides	Construction – L/ Operation – B	Construction – L/ Operation – B	Operation – U	None required
Impact GEO-2: The Project would result in substantial soil erosion or the loss of topsoil	Construction – L/ Operation – S	Construction – L/ Operation – S	Operation – O	MM BIO-4: Design and Construct a Geomorphically Stable Channel
Impact GEO-3: The Project is located on a geologic unit or a 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 – L/ Operation – L	Construction – L/ Operation – L	Operation – O	None required
The Project would not be located on expansive soil, creating substantial risks to life and property	Construction – O/ Operation – O	Construction – O/ Operation – O	Operation – O	None required
The Project would not require any disposal of wastewater requiring soils capable of support a septic system	Construction – O/ Operation – O	Construction – O/ Operation – O	Operation – O	None required

Note:

- O = No Impact
- L = Less than Significant Impact
- S = Significant Impact, but Mitigable to Less than Significant
- U = Significant Unavoidable Impact
- B = Beneficial Impact

5.7.1 Existing Conditions

5.7.1.1 Geology

5.7.1.1.1 Regional Geology

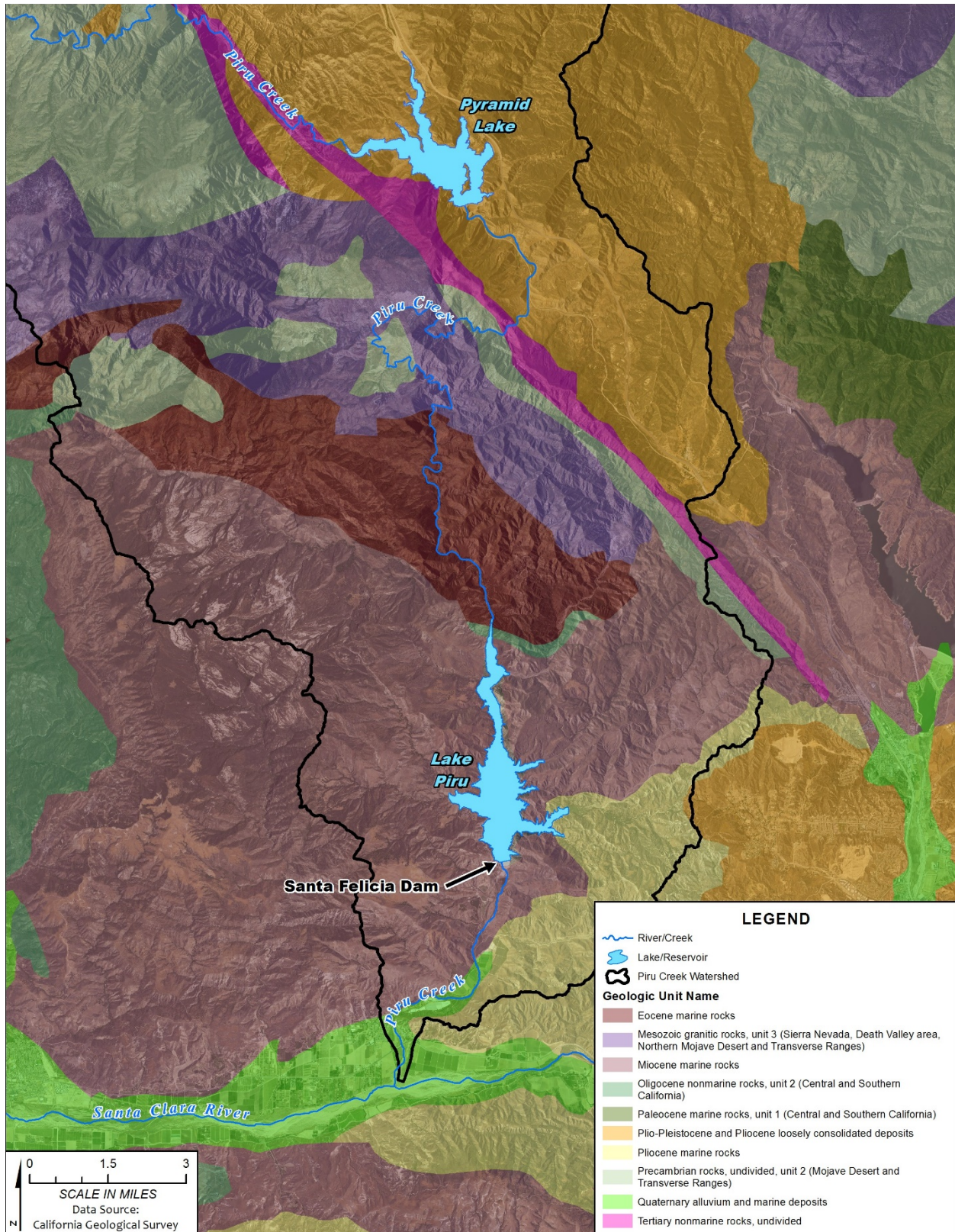
Santa Felicia Dam is located in Piru Canyon, approximately five miles north of the confluence of Piru Creek with the westerly flowing Santa Clara River, in southern Ventura County. The dam site lies within the Transverse Ranges Geomorphic Province of California. This geomorphic province is composed of parallel, east-west trending mountain ranges and sediment-filled valleys that are principally composed of a variety of consolidated marine and terrestrial sedimentary and volcanic rocks of Late Cretaceous through Quaternary age (see Table 5.7-2 for geologic time scale). The Transverse Ranges are relatively young in geological terms and are tectonically active with recent uplift and erosion. In general, the geology of the Piru Creek watershed consists of areas of highly erodible and highly resistant formations, which results in broad alluvial sub-basins alternating with gorges incised in bedrock (USGS 1968).

Table 5.7-2 Simplified Geologic Time Scale

Eon	Era	Period	Dates (mya=million years ago)
Phanerozoic (542.0 mya to present)	Cenozoic (65.5 mya to present)	Quaternary	2.6 mya to present
		Neogene	23 to 2.6 mya
		Paleogene	65.5 to 23 mya
	Mesozoic (251.0 to 65.5 mya)	Cretaceous	145.5 to 65.5 mya
		Jurassic	199.6 to 145.5 mya
		Triassic	251.0 to 199.6 mya
	Paleozoic (542.0 to 251.0 mya)	Permian	299.0 to 251.0 mya
		Carboniferous	359.2 to 299.0 mya
		Devonian	416.0 to 359.2 mya
		Silurian	443.7 to 416.0 mya
		Ordovician	488.3 to 443.7 mya
		Cambrian	542.0 to 488.3 mya
	Precambrian		4,600 to 542.0 mya

Source: Adapted from UCMP 2018

The Piru Creek watershed is bisected by the northwest-trending San Gabriel Fault, which intersects Piru Creek approximately two miles downstream of Pyramid Dam, and approximately 10 miles upstream of the Santa Felicia Dam (USGS 1968). The portion of the watershed situated above Pyramid Lake, between the San Gabriel and San Andreas Faults, is formed by the Ridge Basin (USGS 1968). This basin is composed of non-marine sedimentary groups of Miocene and Pliocene age, which are generally soft and readily erodible (USGS 1968). The geology of the watershed situated between Pyramid Lake and Lake Piru Reservoir is predominantly composed of Mesozoic granitic rock and Eocene marine sedimentary units, and the geology of the watershed situated downstream of the Project is largely composed of Upper Miocene and Upper Pliocene marine units (FERC 2007). The most prevalent formations within the watershed situated between Pyramid Lake and the Santa Clara River include the Sespe Formation, composed of interbedded sandstone and claystone, and the Vaqueros Formation, composed of marine sedimentary strata (FERC 2007). Other formations in the region include the Modelo, Pico, and San Pedro (Saugus) Formations (FERC 2007). The geology in the vicinity of the Project area is shown in Figure 5.7-1.



Source: CGS 2017

Figure 5.7-1 Geology in the Vicinity of the Project

5.7.1.1.2 Project Area Geology

Bedrock in the dam and reservoir area consists primarily of marine sediments assigned to the Monterey (or Modelo) Formation, which was deposited during the middle of the Miocene Epoch in the Neogene Period. In the eastern portions of the Ventura Basin, the Monterey and Modelo Formations are considered equivalent. Based on detailed mapping during pre-construction site investigations, the Monterey Formation in the dam area consists of sandstone and shale strata that are interlayered to various degrees (GEI 2015a). The geology adjacent to the dam is shown in Figure 5.7-2.

Several successive east-west trending anticlinal¹ and synclinal² structures exist in the Piru Creek area. The area of the dam lies on the southern flanks of the Temescal Anticline with the anticlinal axis³ (mapped approximately 1,000 feet upstream of the dam axis. Bedding in the area of the dam generally strikes approximately normal to Piru Creek (east-west), and dips at an average of approximately 50 degrees (measured from horizontal) downstream, to the south. These dips increase locally up to about 70 degrees in locations to the west and south of the immediate area of the dam and spillway (GEI 2015a).

Naturally-occurring hydrocarbons are present in the Project area and consist of small surface oil seeps on the east canyon slopes where the anticlinal axis crosses Piru Creek. Oil was encountered in sandstone recovered from two soil borings installed in the spillway area during the dam's pre-construction exploration phase. In addition, numerous oil seeps were observed at the bottom of the dam core trench excavation during construction (GEI 2015a).

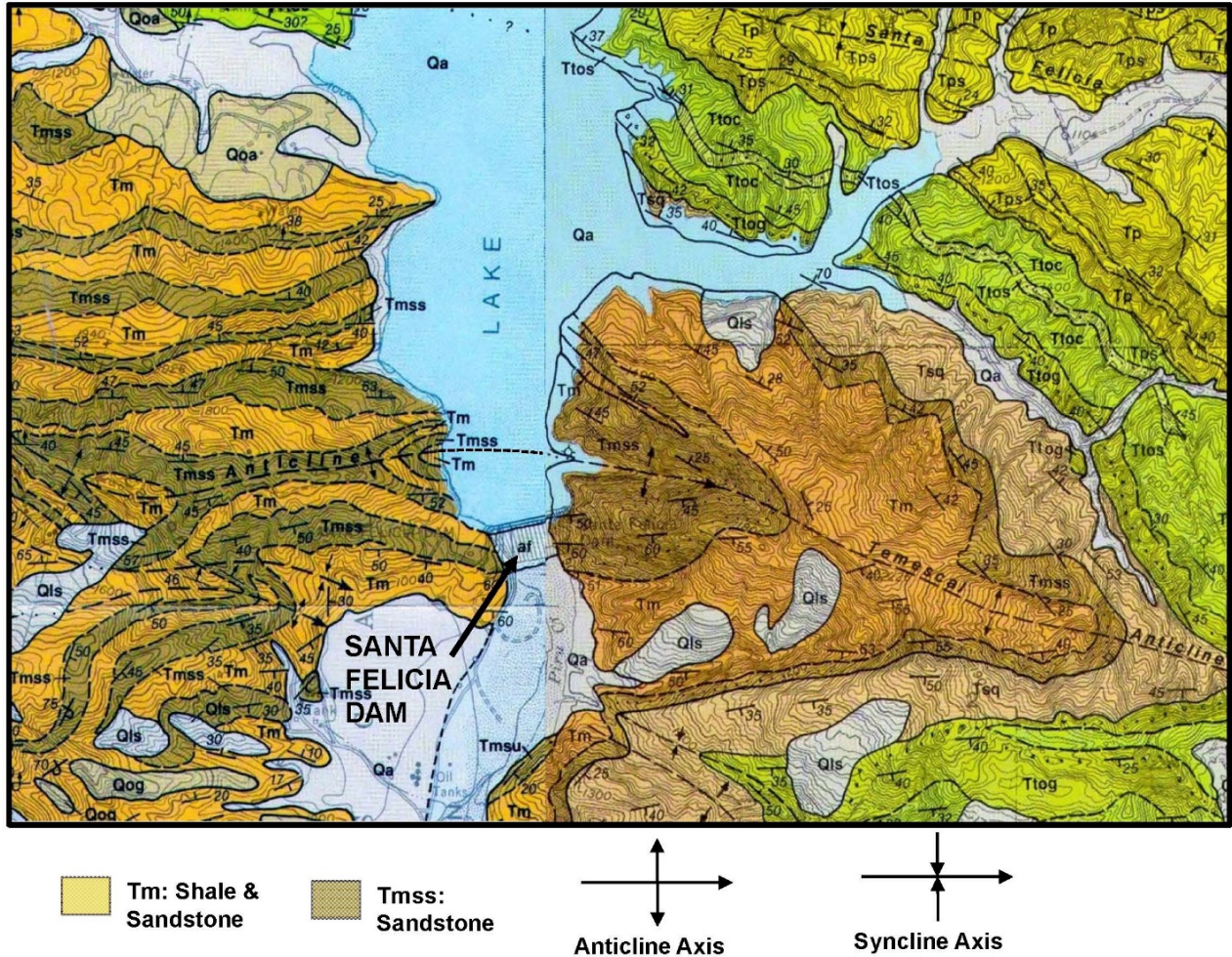
Alluvial deposits in Piru Creek were investigated in the general area of the Santa Felicia Dam footprint prior to its construction through the installation of numerous soil borings. Alluvium consisting of sands, gravels, cobbles, and boulders was encountered to depths of up to 85 feet in these borings. Mappable accumulations of talus deposits⁴ were encountered in the lower portions of the east-facing hillsides west of the spillway (GEI 2015a). Geologically recent stream terrace deposits are present along the right abutment of the dam, the spillway area, and on the hillsides to the south of the dam. These deposits are composed of sand, silt, gravels, boulders, and some clay, which overlie the sedimentary bedrock (GEI 2015a). These younger sediments were encountered in pre-construction boreholes to depths of up to 66 feet and appeared to be thickest in the spillway area with pronounced shallowing to the east and west of the spillway.

¹ An anticline is a type of geological fold that has an arch-like shape and has the oldest beds at its core.

² A syncline is a type of geological fold with layers that dip downward toward the center of the structure and has the youngest beds at its core.

³ An anticlinal axis is a line or ridge from which the strata slope downward on the two opposite sides.

⁴ Talus deposits consist of slopes formed by an accumulation of broken rock debris from adjacent cliff faces, and typically have a concave upwards form with a maximum inclination corresponding to the angle of repose associated with the mean debris size.



Source: Dibblee 1991 and 1993

Figure 5.7-2 Geology Adjacent to Santa Felicia Dam

5.7.1.2 Soils

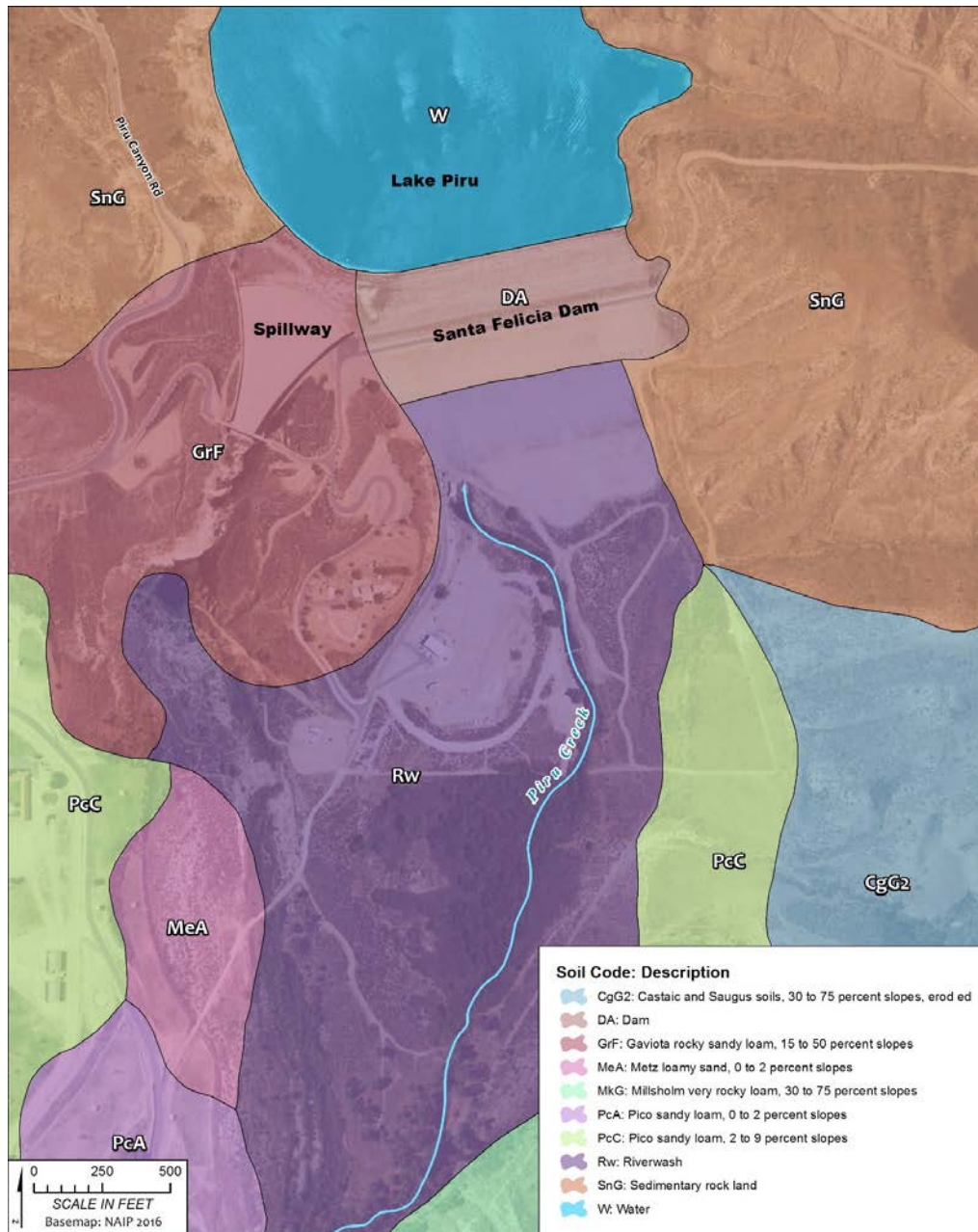
Major soil formations occurring in the Project area consist of Gaviota rocky sandy loam (GrF), Pico sandy loam (PcA and PcC), Metz sandy loam (MeA), and Castaic and Saugus soils (CgG2) (USDA-NRCS 2017). The distribution of these soils is shown in Figure 5.7-3, and an overview of their properties is provided in Table 5.7-3.

Table 5.7-3 Overview of Soil Associations Present in the Vicinity of the Project

Soil Association	General Features
Gaviota rocky sandy loam (GrF)	Very shallow or shallow, well-drained soils formed in material weathered from hard sandstone or meta-sandstone. These soils are located on hills and mountains with slopes of 2 to 100 percent.
Pico sandy loam (PcA and PcC)	Deep, well-drained soils that formed in alluvium from mostly sedimentary rocks. These soils are located on floodplains and alluvial fans with slopes of 0 to 9 percent.

Soil Association	General Features
Metz sandy loam (MeA)	Very deep, somewhat excessively drained soils that formed in alluvial material from mixed, but dominantly sedimentary rocks. These soils are located on floodplains and alluvial fans with slopes of 0 to 15 percent.
Castaic soils (CgG2)	Well-drained soils that occur on strongly sloping to very steep slopes. These soils are formed in residuum weathered from shale, sandstone, and mudstone.
Saugus soils (CgG2)	Deep, well-drained soils that formed from weakly consolidated sediments. These soils are located on dissected terraces and foothills with slopes of 9 to 50 percent.

Source: USDA-NRCS 2017



Source: USDA-NRCS 2017

Figure 5.7-3 Soils in the Vicinity of Santa Felicia Dam

5.7.1.3 Seismicity

Southern California is a seismically active region, dominated by the intersection of the northwest-trending San Andreas fault system and the east-west-trending Transverse Ranges fault system. Both systems are responding to strains produced by the relative motions of the Pacific and North American tectonic plates resulting in mountain building, basin development, deformation of Quaternary marine terraces, widespread regional uplift, and generation of earthquakes. Active faults of the San Andreas system are predominantly strike-slip faults⁵ accommodating translational movement⁶. The Transverse Ranges fault system consists primarily of blind reverse and thrust faults accommodating tectonic compression stresses in the region. Blind faults have no surface expression and have been located using subsurface geologic and geophysical methods. This combination of translational and compressive stresses gives rise to the region's widespread seismicity.

The local seismic environment was studied in a seismicity analysis as part of the seismic deformation analysis of the embankment (GEI 2015c). A map showing the location of faults in the vicinity of Santa Felicia Dam is shown in Figure 5.7-4. The controlling seismic source⁷ for Santa Felicia Dam is the San Cayetano Fault, located about 1.9 miles south of the dam. The San Cayetano Fault is a thrust-faulty that is approximately 28 miles long, and the most recent rupture is listed as less than 5,000 years ago (SCEDC 2017). The peak ground acceleration at the dam site from a moment magnitude (M_w) 7.2 earthquake on this fault was computed to be 1.17g (g is the acceleration due to Earth's gravity), considered to be a relatively large amount of seismic loading (GEI 2015c). In regard to seismic shaking, the Project is located in an area with relatively high shaking potential as shown in Figure 5.7-5.

5.7.1.4 Landslides and Lateral Spreading

The Project area has been classified as an earthquake-induced landslide risk zone by Ventura County (Ventura County 2010a). Quaternary landslides⁸, some very large, are located in the general vicinity of the Project site. Several active and historical landslides have occurred in the area southeast of Santa Felicia Dam although they are not contiguous with it. Three other dormant landslides are situated on the slopes northwest of the dam along the reservoir canyon walls (CDOC 2017a). Figure 5.7-6 shows the landslide areas in the vicinity of the Project including their current status.

Currently, the recognized landslide features are generally considered in a state of quasi-equilibrium. However, intense rainfall and localized erosion can reactivate the existing landslides. In addition, seismic events can induce landslides, especially in areas with historical landslides, as well as lateral spreading⁹. Areas susceptible to earthquake-induced landslides and/or lateral spreading in the vicinity of the Project are shown in Figure 5.7-7.

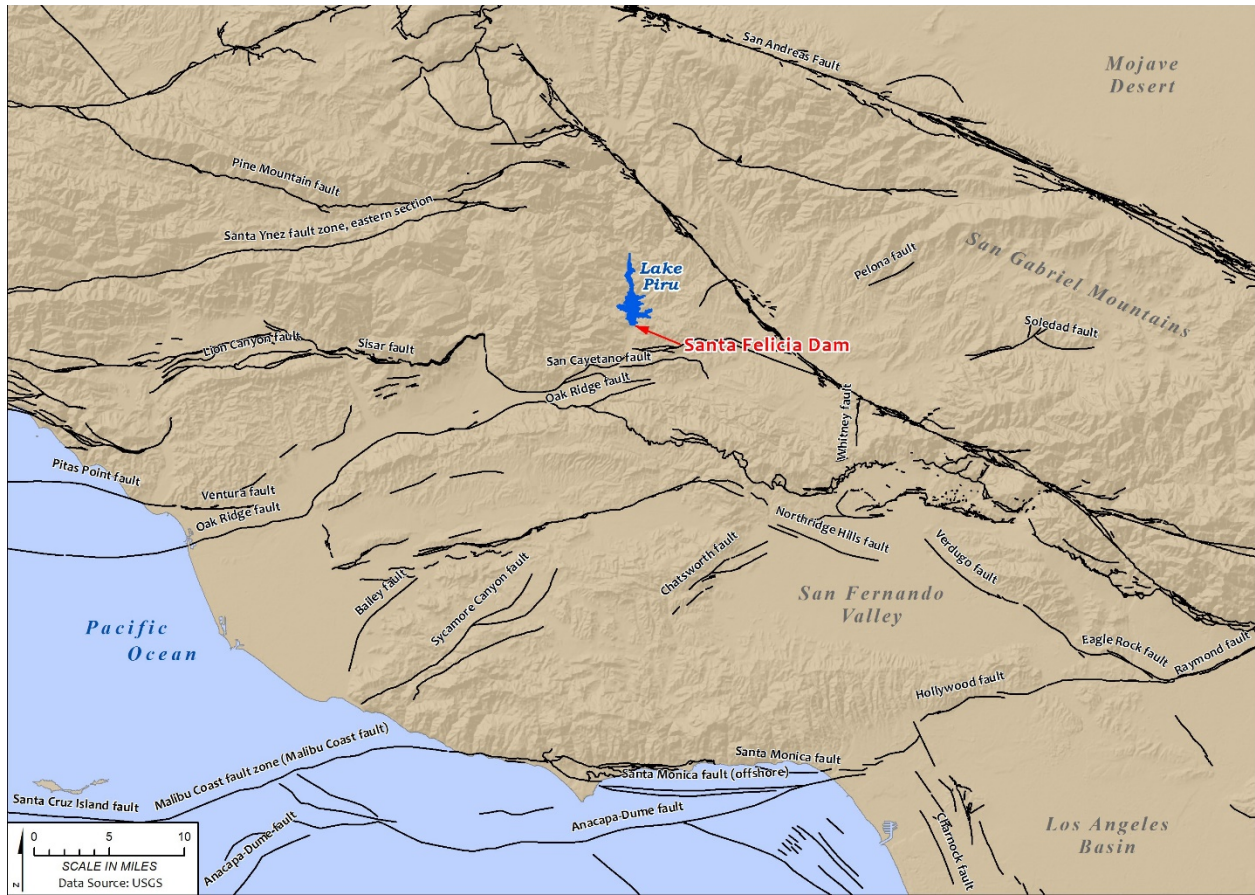
⁵ A fault in which rock strata are displaced mainly in a horizontal direction, parallel to the line of the fault.

⁶ Primarily planar movement with limited rotation.

⁷ The seismic hazard that has the greatest potential for affecting the dam.

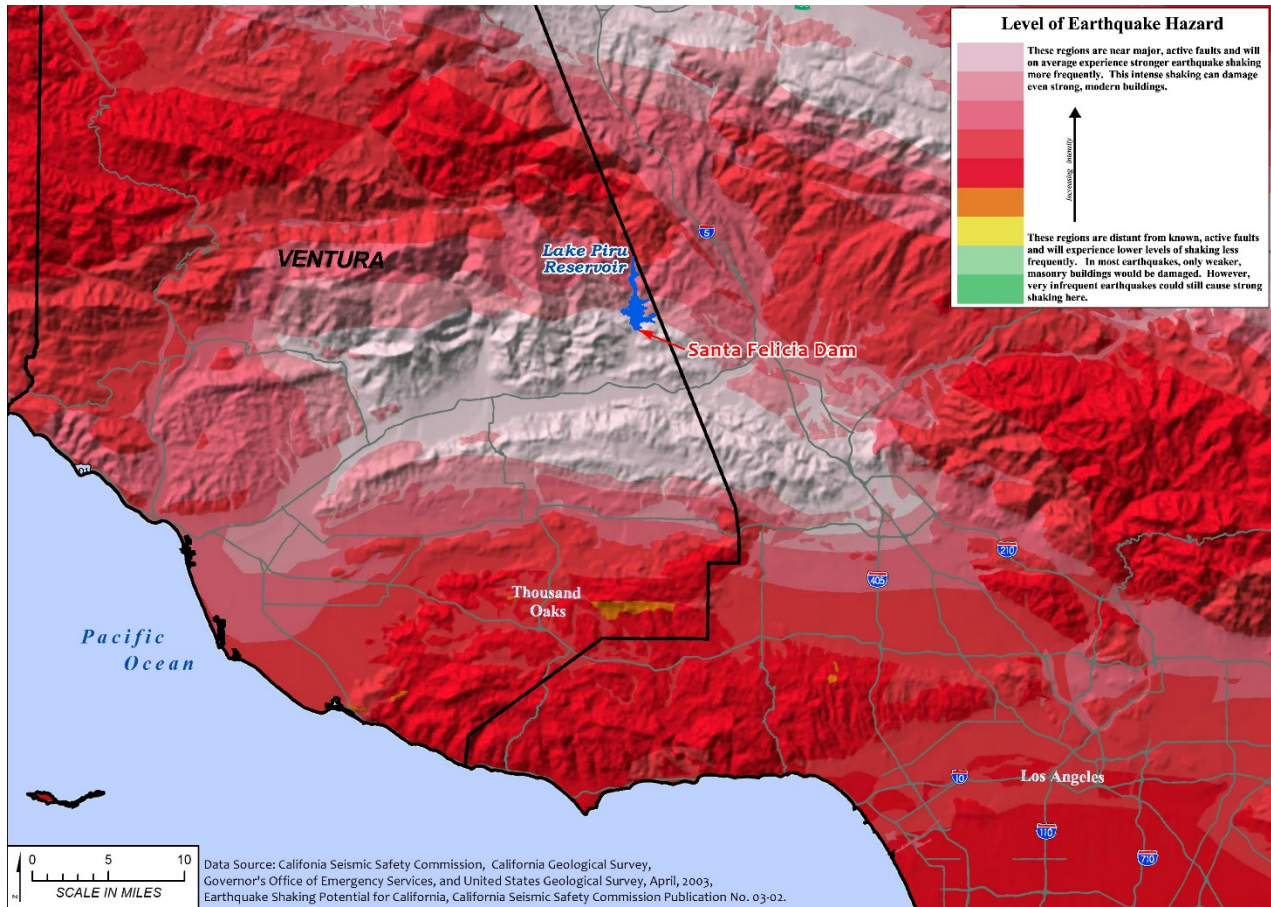
⁸ Landslides that have occurred in the current and most recent period of the Cenozoic Era.

⁹ Lateral spreading is a type of landslide commonly formed on gentle slopes that is induced by liquefaction as a result of strong seismically induced ground shaking.



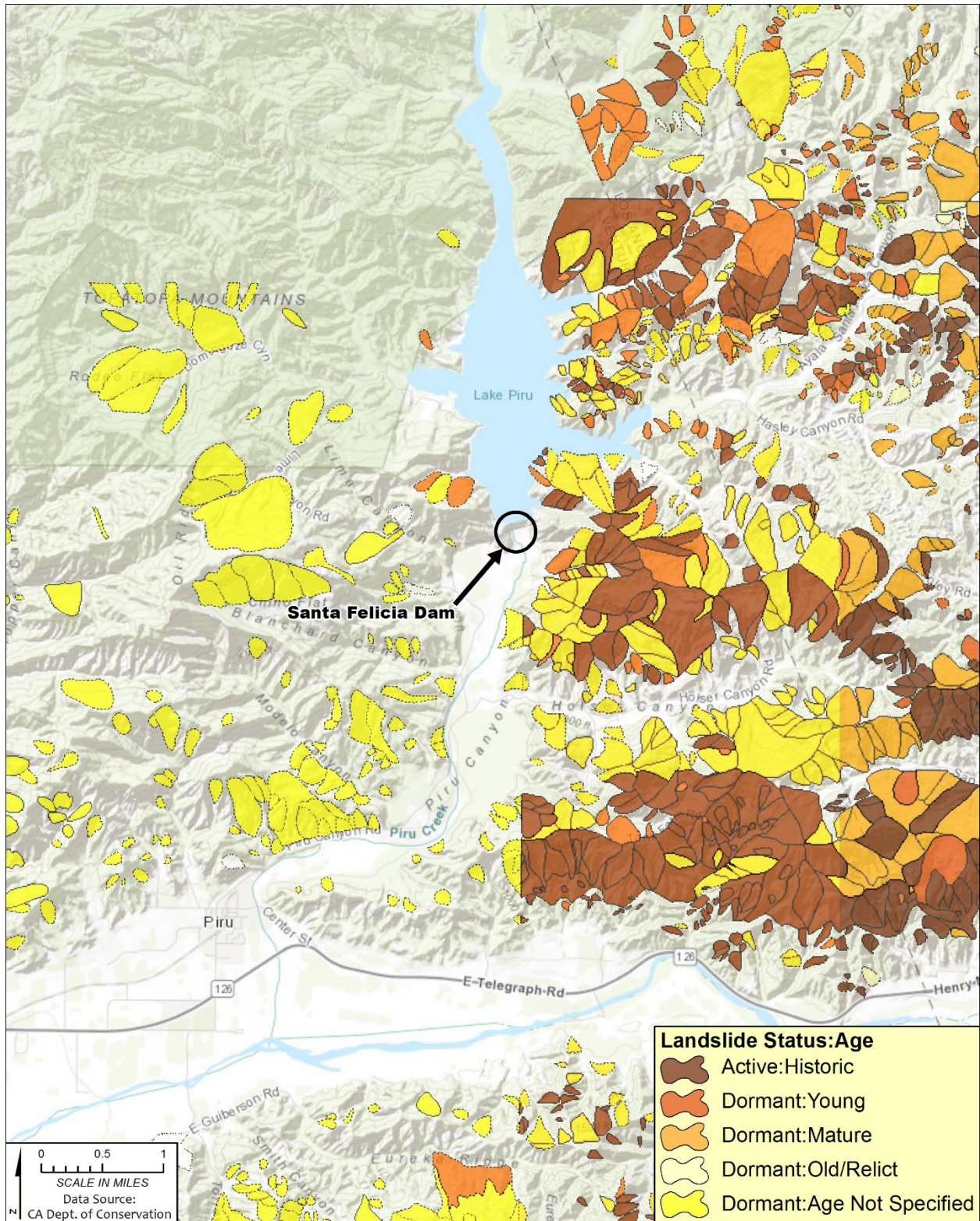
Source: GEI 2015c

Figure 5.7-4 Faults in the Vicinity of Santa Felicia Dam



Source: California Seismic Safety Commission 2017

Figure 5.7-5 Earthquake Shaking Potential in the Vicinity of the Project



Source: California Department of Conservation 2017a

Figure 5.7-6 Landslide Zones in the Vicinity of Santa Felicia Dam



Source: California Department of Conservation 2017b

Figure 5.7-7 Liquefaction Zones and Areas Susceptible to Earthquake-Induced Landslides in Area of Santa Felicia Dam

5.7.1.5 Liquefaction

Liquefaction is another known geological hazard in the Project area due to the local groundwater and soil conditions. Liquefaction is the process in which granular materials temporarily act as a fluid instead of a solid, which can cause permanent ground displacements. Liquefaction zones in the vicinity of the Project are displayed in Figure 5.7-7. This figure shows the channel area immediately downstream of the Santa Felicia Dam as a liquefaction zone (California Department of Conservation 2017b).

Site-specific geotechnical investigations were conducted in 1981 and 2000 (GTC 1981 and Harza 2000) to evaluate the susceptibility of the material underlying Santa Felicia Dam for liquefaction under seismic loading. Both studies concluded that the alluvium is sufficiently dense that it is not likely subject to liquefaction.

In May 2013, FERC requested that the liquefaction potential of the foundation alluvium be reassessed in light of an increase in the computed peak ground acceleration (PGA) for the dam site. In response to FERC, AMEC evaluated the dam site and concluded that the foundation alluvium is not subject to widespread liquefaction due to an increase in the computed PGA (AMEC 2013). In a letter dated June 9, 2014, FERC concurred that widespread liquefaction of the alluvium foundation is unlikely (FERC 2014).

5.7.1.6 Expansive Soils

Expansive soils shrink and swell in volume as a result of the wetting and drying of fine-grained clay-rich sediments. Development on expansive soils can result in damage to overlying structures over a long period due to continued movement of soil. The shrink-swell potential of soils is localized in nature and requires site-specific geotechnical testing to definitively determine if local soil conditions represent a hazard. In addition, hazards associated with expansive soils are mitigated by regulations such as the Uniform Building Code which require soils testing prior to any development in order to identify and address potential issues associated with expansive soils prior to development.

Figure 5.7-8 provides an overview the shrink-swell potential of soils in the vicinity of the Project. The area adjacent and upstream of the Santa Felicia Dam is characterized as having “medium” expansive soil rating and the area immediately downstream is characterized as having a “low” expansive soil rating (Ventura County 2013).

5.7.1.7 Subsidence

Subsidence is any settling or sinking of the ground surface over a regional area that commonly occurs as a result of excessive groundwater and/or oil extraction. As water or oil is removed from the subsurface, the total weight of the overburden that the water/oil used to help to support is placed on the alluvial structure; the overburden can then become compressed. If fine-grained silts and clays make up portions of the aquifer/oil reservoir, the additional load can squeeze the water/oil out of these layers and into the coarser grained portions of the aquifer/oil reservoir. This compaction produces a net loss in volume and hence a depression in the land surface.

Ventura County includes several areas that are experiencing subsidence including, most prominently, the Oxnard Plain (Ventura County 2013). Areas along the Santa Clara River are also at risk for subsidence (Ventura County 2013). The Project is not situated in an area experiencing subsidence as shown in Figure 5.7-9.

5.7.1.8 Seiches

A seiche is defined as water waves that are generated in a closed or restricted body of water such as a lake or within a harbor, in response to a seismic event. The shaking of an earthquake can result in large and destructive oscillations that produce waves significantly above normal lake levels. The extent of most seiches is small, usually no more than ten to twenty feet above water level, and the duration is short, usually only a few minutes (Ventura County 2013).

No seiches have been recorded in Ventura County indicating that the actual threat posed by seiches in Ventura County is small (Ventura County 2013). However, the potential damage associated with seiches could be severe. Accordingly, it is recommended that structures in areas with the potential for seiches evaluate mitigation of potential seiche effects during the preliminary design phase (Ventura County 2013).

5.7.2 Regulatory Framework

Federal, State, and local laws and regulations pertaining to geology and soils in the Project area are summarized in the following paragraphs. State and local requirements are included to characterize the overall context of the analyses, even though some of these requirements do not directly apply to this Federal action.

5.7.2.1 *Federal*

Pursuant to sections 4(e) and 15 of the Federal Power Act, FERC issued a license for operation of the Santa Felicia Hydroelectric Project (the existing dam facility) dated September 12, 2008. The license specifies various conditions for operation and maintenance of the Project. In cooperation with DSOD, FERC is also responsible for regulatory oversight regarding the safety and integrity of Santa Felicia Dam with respect to geologic and seismic hazards. As part of the process, FERC requires an independent BOC to oversee and assess the adequacy of the investigations, designs, and construction activities for the outlet works and spillway remediation for the project. In this regard, FERC coordinates with the Board of Consultants to ensure that the proposed Project complies with applicable design standards.

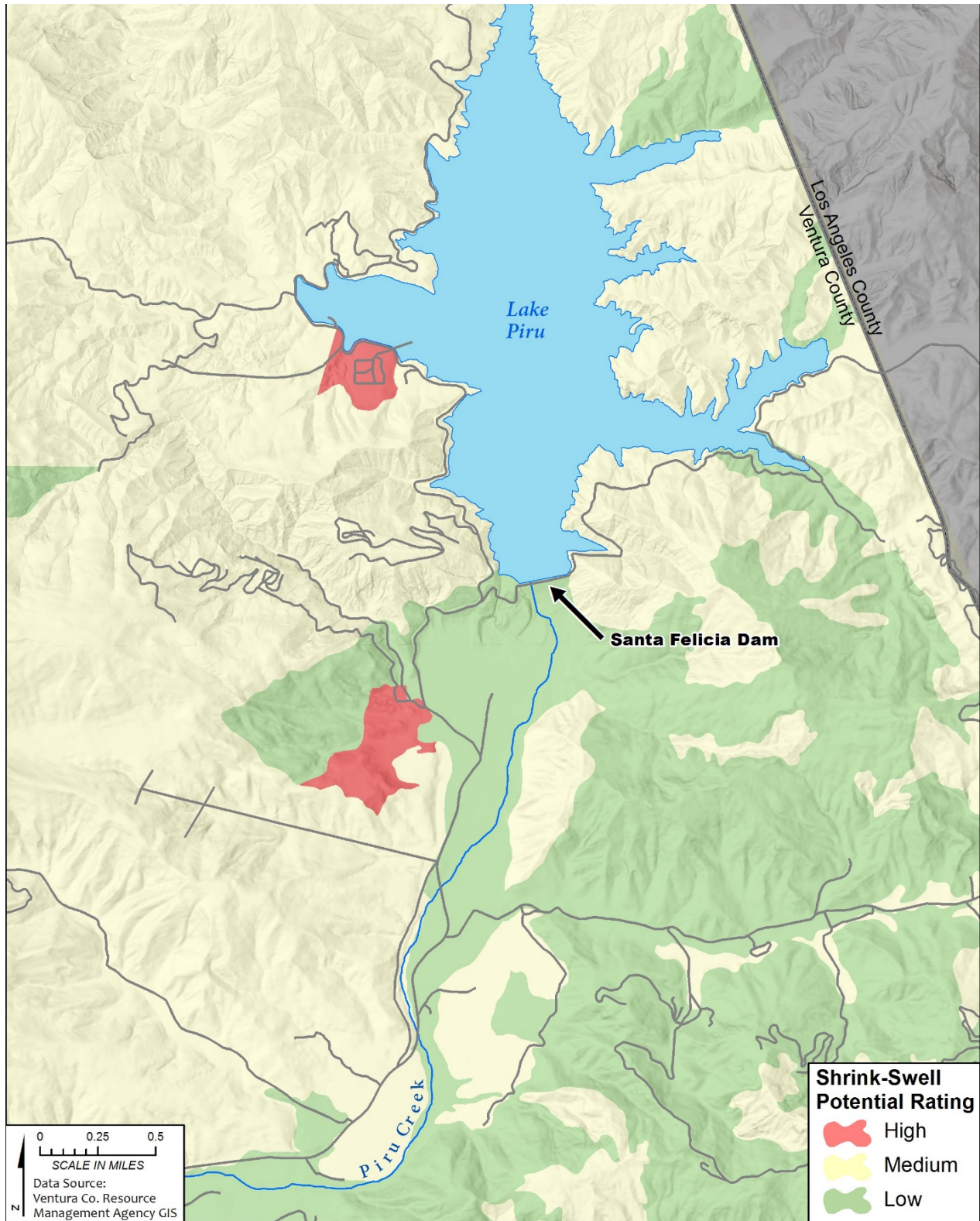
5.7.2.2 *State*

5.7.2.2.1 Alquist-Priolo Earthquake Fault Zoning Act (PRC Section 2621 et seq.)

The 1972 Alquist-Priolo Earthquake Fault Zoning Act requires local agencies to regulate development within earthquake fault zones to reduce the hazards associated with surface fault ruptures. It also regulates construction in earthquake fault zones. The Project site is not located within an Alquist-Priolo Special Fault Study Zone.

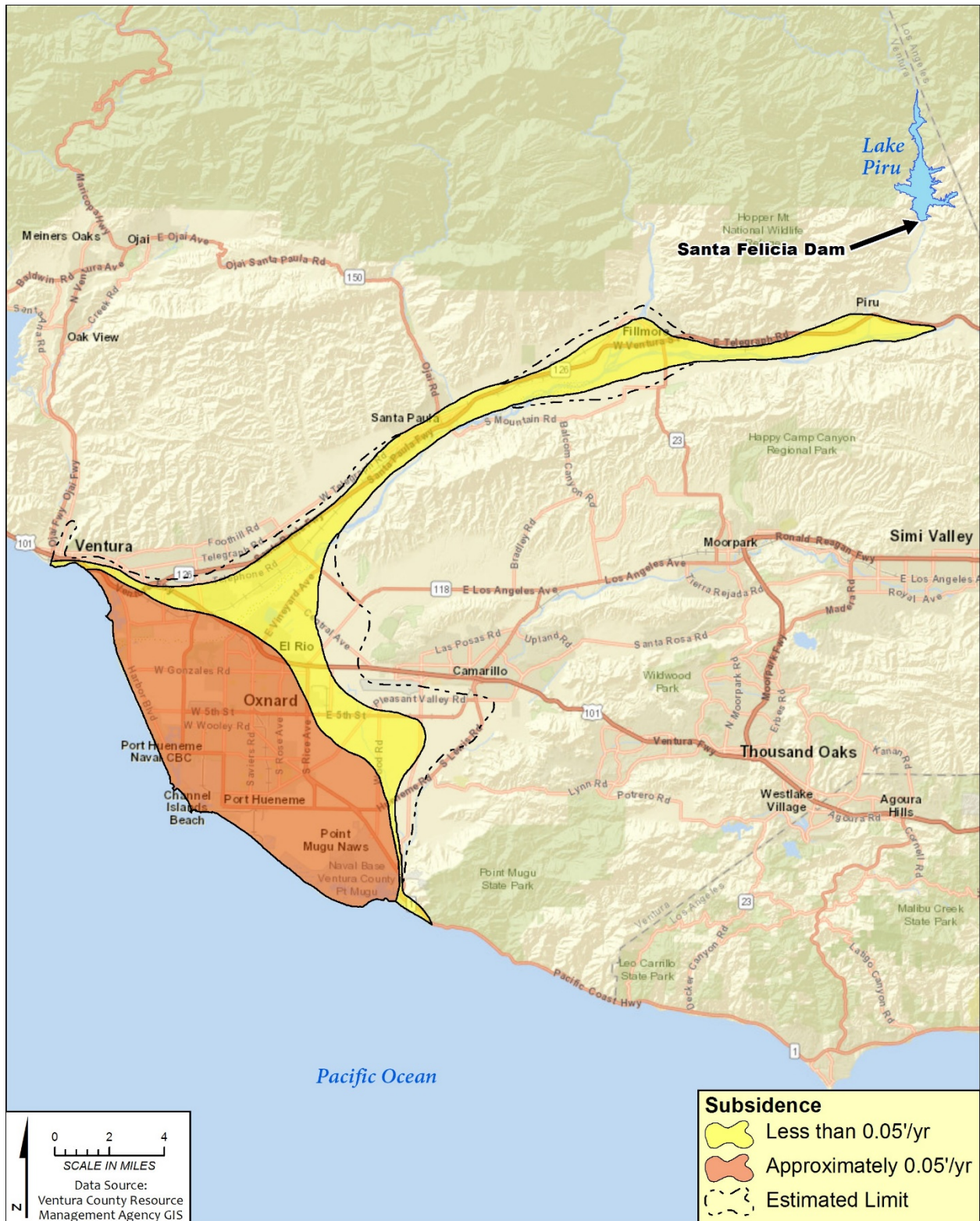
5.7.2.2.2 1990 Seismic Hazards Mapping Act (PRC Sections 2690-2699.6)

The 1990 Seismic Hazards Mapping Act addresses strong ground-shaking, liquefaction, landslides, or other ground failures as a result of earthquakes. This Act requires statewide identification and mapping of seismic hazard zones, which are to be used by cities and counties to adequately prepare the safety elements of their general plans and protect public health and safety. Local agencies are also required to regulate development in any seismic hazard zones, primarily through permitting. Permits for development projects are not issued until geologic investigations have been completed and mitigation has been developed to address any issues. The Project is not subject to County permitting requirements as described previously.



Source: Ventura County Resource Management Agency 2017a

Figure 5.7-8 Expansive Soils in the Vicinity of the Project



Source: Ventura County Resource Management Agency 2017a

Figure 5.7-9 Ventura County Subsidence Areas

5.7.2.2.3 California Division of Safety of Dams (California Water Code Division 3, Dams and Reservoirs)

Since August 14, 1929, the State of California has supervised dams to prevent failure, to safeguard life, and to protect property. Dams and reservoirs are defined in the California Water Code Sections 6002, 6003, and 6004. Certain exemptions to these regulations, such as storage ponds related to waste water control facilities, are included in Sections 6004 and 6025. All dams that are not exempt, including Santa Felicia Dam, are subject to State supervision unless they are owned and operated by the Federal government. Along with FERC, the DSOD is responsible for reviewing and approving the Project design and construction plans to ensure that they comply with applicable design standards. Specifically, the Project would increase the design capacity of the spillway to convey the revised IDF (as discussed in Section 3.0) in order to meet current regulatory requirements and construct a new outlet works system that is designed to comply with current seismic safety standards.

5.7.2.3 Local

Although Santa Felicia Dam is located within unincorporated Ventura County, it is exempt from County permit requirements because it is a State water storage and power generation facility, regulated by a license issued by FERC under the Federal Powers Act. Therefore, the Project is not subject to the provisions of the Ventura County General Plan or other local ordinances, regulations, or policies.

5.7.2.3.1 Ventura County General Plan

The relevant goals and policies related to geology and soils from the Ventura County General Plan (Ventura County 2016a) are provided as follows for informational purposes:

1. Identify all major hazards and other physical constraints to development in Ventura County, and convey this information to all appropriate parties (Section 2.1).
2. Protect public health, safety and general welfare from identified hazards and potential disasters (Section 2.1).
3. Minimize the risk of loss of life, injury, collapse of habitable structures, and economic and social dislocations resulting from fault rupture (Section 2.2.1).
4. Minimize the risk of loss of life, injury, collapse of habitable structures, and economic and social dislocations resulting from ground-shaking (Section 2.3.1).
5. Minimize the risk of loss of life, injury, collapse of habitable structures, and economic and social dislocations resulting from seiche (Section 2.5.1).
6. Minimize the risk of damage to structures from the effects of expansive soils (Section 2.8.1).

While not directly applicable, the Project is consistent with these goals as its objective is to improve the safety of Santa Felicia Dam by ensuring that the spillway can safely convey the outflow from the regulatory IDF and that the outlet works can withstand seismic loading from the MCE.

5.7.3 Impacts and Mitigation Measures

Potential impacts were evaluated through review of available information and assessing the potential for construction and support actions involved with the Project and each alternative to exacerbate geological hazards and/or soil conditions. The factors that are important for evaluating impacts include the proximity of faults and frequency of seismic activity; the characteristics and composition of rock and soils; the depth and areal extent of the blasting, excavation and disturbance of rock and soils; and the physical characteristics of the work site, including site topography, slope, drainages, depth-to-groundwater and susceptibility to flooding. An important consideration in this analysis is that the Project being evaluated is designed with oversight from FERC, DSOD, and the BOC to comply with current seismic safety standards and to withstand site-specific geologic, soil, and seismic conditions to greatly reduce the probability of

dam failure. The analysis also accounts for regulatory controls, BMPs, and associated environmental permit conditions in evaluating the potential for construction-related or induced geologic hazards. If the analysis determines that impacts would be significant even after implementation of BMPs, regulatory controls, and permit conditions, then additional mitigation measures are recommended.

5.7.3.1 Significance Criteria

UWCD reviewed Appendix G of the CEQA Guidelines to determine whether the Project would result in significant impacts related to geology and soils. The criteria listed below consider if the Project would:

- a) Expose people or structures to 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, ground-shaking, liquefaction, or landslides.
- b) Result in substantial soil erosion or the loss of topsoil.
- c) Be located on a geologic unit or a soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.
- d) Be located on expansive soil, as defined in California Building Code (2012), creating substantial risks to life or property.
- e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

Of the criteria listed above, only criteria a, b, and c are applicable to the Project and are evaluated in detail below. Criterion d is not discussed below since the Project is situated in an area with soils that are classified as having low to medium shrink-swell potential, and site-specific geotechnical testing would be conducted during the design-phase of the Project to identify and address potential hazards associated with expansive soils, if present. The Project does not involve the use of septic tanks or alternative wastewater disposal systems, so criterion e is not applicable.

5.7.3.2 Proposed Project

The impact analysis includes a combined discussion of both the spillway modifications and the construction of new outlet works. The impacts associated with the Project components are similar with respect to the significance criteria outlined above. However, where different, the impact analysis addresses each component separately.

Impact GEO-1: The Project would reduce the exposure of people and/or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, ground-shaking, liquefaction, and landslides (Construction – less-than-significant impact; Operation – beneficial impact).

Construction

The Project site is not located within an Alquist-Priolo Special Fault Study Zone or a Ventura County-designated Earthquake Fault Hazard Zone and is not located on a known, active fault. Accordingly, no impacts associated with fault rupture are anticipated during construction.

Strong seismic ground-shaking could potentially damage temporary structures such as field offices and displace staged construction materials placing construction workers at risk. In addition, strong ground-shaking could potentially compromise the integrity of the tunnel during construction of the new outlet works system. In order to minimize impacts, the tunneling activities would be conducted in compliance with applicable seismic safety standards as specified in the construction plan that would be reviewed and approved by FERC and DSOD.

In regard to liquefaction, site-specific geotechnical investigations have determined that liquefaction of the alluvium foundation of the dam is unlikely as discussed in Section 5.7.1.5. However, the channel area below Santa Felicia Dam, where staging of construction equipment and materials would occur, has been identified as having a potential for seismically-induced liquefaction. Accordingly, seismically-induced liquefaction could potentially impact temporary structures, construction equipment, and staged materials in these areas.

While no currently active landslides have been identified adjacent to Santa Felicia Dam (California Department of Conservation 2017a), the Project area is situated within Piru Canyon which includes areas with the potential for future landslides triggered by strong ground-shaking, which could potentially impact temporary structures, construction equipment, and staged materials in adjacent areas.

The construction period for the Project would be temporary and relatively short-term, approximately 24 months for the outlet works system and 24 months for the spillway modifications. The specific date of the last rupture of the San Cayetano Fault, the nearest fault to the Project, is not known, but it is reported to be less than 5,000 years ago (CalTech 2018). Assuming that it ruptures approximately once every 1,000 to 5,000 years, the probability of a rupture in any given year is 0.02 percent to 0.1 percent; therefore, the probability that strong seismic ground-shaking associated with the San Cayetano Fault would occur during the construction period would be low. Accordingly, while impacts associated with an earthquake could be substantial, the impacts are considered less than significant given the low probability of an earthquake occurring during construction period.

Operation

The objectives of the Project are to enhance the safety of the dam by reducing risks of overtopping during significant flood events and to reduce potential dam failure during seismic events. Under current conditions, a seismic deformation analysis performed for the Santa Felicia Dam and outlet works concluded that settlement of the dam crest as a result of seismic loading would be less than the normal 20-foot freeboard of the dam. Therefore, overtopping due to a large earthquake, such as the design conditions consisting of an earthquake with a moment magnitude (M_w) of 7.2 on the San Cayetano Fault, would not be expected (GEI 2015c). In addition, site-specific geotechnical investigations have determined that seismically-induced liquefaction of the alluvium foundation of the dam is unlikely (GEI 2015c). However, a study conducted in 2012 indicated that the existing intake tower and steel penstock portion of the outlet works system would likely fail under seismic loading conditions, and that failure of this infrastructure would compromise the safety of the dam and impact the ability for UWCD to conduct water releases from the dam (GEI 2012). As such, the Project would reduce this potential risk by constructing a new outlet works system that complies with current seismic standards and would provide a beneficial impact.

Impact GEO-2: The Project would not result in substantial soil erosion or the loss of topsoil (Construction – less-than-significant impact; Operation – significant impact, but mitigable to a less-than-significant level).

Construction

Project construction would require grading and excavation of previously disturbed and undisturbed soils and bedrock, which would result in exposed soils subject to erosion. The largest source of potential erosion would be uncontrolled runoff over exposed slopes during construction. Project excavation, grading, and stockpiling would result in a temporary increase in the amount of soil exposed to wind and water erosion. However, implementation of sediment and erosion control measures, such as silt fences, sandbag barriers, watering of exposed soils, and other BMPs as required under the NPDES General Stormwater Discharge Associated with Construction and Land Disturbance Activities permit, (refer to Section 5.10, Hydrology and Water Quality) would reduce the potential for erosion and loss of topsoil.

With implementation of the requirements of the NPDES permit, potential impacts would be less than significant.

Operation

The Project would increase the design capacity of the spillway to convey the revised IDF in order to meet current regulatory requirements as well as construct a new outlet works system to protect the integrity of Santa Felicia Dam in the case of a seismic event, creating a more reliable system to deliver water releases downstream of the dam. The preferred alternative spillway modification component of the Project would modify the existing spillway structure by either deepening or widening the spillway chute with a crest raise. These modifications would permanently alter the spillway structure and adjacent topography. However, it would not alter the drainage pattern as flood flows would still be conveyed through the spillway channel. The Project does not include any changes to the current operations. Given that flood flows would continue to be conveyed through the spillway chute and associated channel, with current operations remaining unchanged, operation of the modified spillway would not result in substantial erosion or loss of topsoil, and impacts would be less than significant.

Upstream of Santa Felicia Dam, the proposed 6.5-foot increase in the dam crest elevation would not increase the working capacity of Lake Piru Reservoir. There would be no change to the existing operations or the existing ranges in water levels in Lake Piru Reservoir, as described in Section 2.4, Lake Piru Reservoir operation. Based on the available hydrologic record, the probability of occurrence of the updated IDF of 220,000 cfs is approximately 0.05 percent in any given year (approximately once every 2,000 years). For context, the estimated 500-year peak inflow to Lake Piru Reservoir is 146,400 cfs (which is 3.7 times the inflow of the January 10, 2005 storm event) and the estimated 100-year flood is 68,800 cfs. Thus, the probability of occurrence of the updated IDF is extremely low, and impacts associated with substantial soil erosion or loss of topsoil upstream of the dam are considered less than significant.

The new outlet works system would be constructed along the left abutment of Santa Felicia Dam and the existing outlet works on the right abutment of the dam would be decommissioned. The shift from the right abutment to the left abutment would result in the dewatering of between 480 feet and 1,200 feet of existing channel in lower Piru Creek (depending on the final design) that is situated between the existing outlet works and the confluence of the discharge channel associated with the new outlet works. This component of the Project would alter the existing drainage pattern downstream of Santa Felicia Dam and has the potential to result in a significant impact through substantial erosion or loss of topsoil. However, with incorporation of MM BIO-4 discussed in Section 5.5.4.2, the potential impact would be reduced to a less than significant level.

Lastly, the Project would reduce the likelihood that flood flows would overtop the dam and the resulting potential for dam failure due to erosion of the dam face. As a result, the Project would provide a beneficial long-term impact associated with the reduction in the potential for erosion downstream of the dam.

Mitigation Measures

MM BIO-4. Design and Construct a Geomorphically Stable Channel connecting the New Outlet Works Release Point to the Main Lower Piru Creek Channel. This mitigation measure is discussed in Section 5.5.4.2 as MM BIO-4.

Residual Impact

Implementation of MM BIO-4 would reduce impacts associated with abandonment of between 480-foot and 1,200-foot of existing channel in lower Piru Creek (depending on the final design) immediately downstream of the existing water release point to a less than significant level by creating a geomorphically stable channel of similar length that conveys the range of flows required by the Santa

Felicia Hydroelectric Project FERC license and the DSOD as well as the estimated sediment loads without excessive scour or deposition. Accordingly, residual impacts would be less than significant.

Impact GEO-3: The Project would not be located on a geologic unit or a soil that is unstable, or that would become unstable as a result of the Project, and would not result in on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse (Construction – less-than-significant impact; Operation – less-than-significant impact).

Construction

Site-specific geotechnical investigations were conducted in 1981 and 2000 (GTC 1981 and Harza 2000) to evaluate the susceptibility of the material underlying Santa Felicia Dam for liquefaction under seismic loading. Both studies concluded that the alluvium is sufficiently dense that it is not likely subject to liquefaction. In May 2013, FERC requested that the liquefaction potential of the foundation alluvium be reassessed in light of an increase in the computed PGA for the dam site. In response to FERC, AMEC evaluated the dam site and concluded that the foundation alluvium is not subject to widespread liquefaction due to an increase in the computed PGA (AMEC 2013). In a letter dated June 9, 2014, FERC concurred that widespread liquefaction of the alluvium foundation is unlikely (FERC 2014). Accordingly, the Project site is not located on a geologic or a soil unit that is currently known to be unstable. In addition, the Project is not located in an area of subsidence.

Landslides and liquefaction are addressed under Impact GEO-1. The risks associated with lateral spreading are similar to landslides in that no currently active landslides or areas of lateral spreading have been identified adjacent to Santa Felicia Dam (California Department of Conservation 2017a). However, the Project area is situated within Piru Canyon which includes areas with the potential for future landslides and/or landslides/lateral spreading triggered by strong ground-shaking during earthquakes that could potentially impact temporary structures, construction equipment, and staged materials in adjacent areas. As concluded in Impact GEO-1, while impacts associated with landslides/lateral spreading associated with an earthquake could be substantial, the impacts are considered less than significant given the low probability of an earthquake occurring during construction period.

Operation

As described above, no currently active landslides have been identified adjacent to Santa Felicia Dam (California Department of Conservation 2017a) and the Project site is not located on a geologic unit or soil that is known to be unstable. In addition, as required by FERC and DSOD, the Project design would incorporate measures to protect against and mitigate potential geological or soil hazards. Therefore, following construction, the potential for collapse or structural damage as a result of geological or soil hazards would be less than significant. Further, the objective of the Project is to enhance the integrity and stability of the dam to withstand design flood events and seismic hazards. Hence, the Project would provide beneficial impacts in comparison to current conditions.

5.7.3.3 Labyrinth Alternative

Operation of this alternative would be the same as that for the Project, and the construction requirements would be similar to the requirements provided for the Project with the exception that the dam crest would not need to be raised and it would involve substantially more demolition and concrete placement. However, the activities would not increase the potential for erosion or exposure to geologic hazards. Accordingly, impacts relative to geology and soils associated with the Labyrinth Alternative would be similar in extent and intensity as those described above for the Project for each significance criteria.

5.7.3.4 No Project Alternative

Under the No Project Alternative, no improvements to Santa Felicia Dam, the existing spillway, or the existing outlet works system would be implemented. The conveyance capacity of the existing spillway

would remain less than the established regulatory IDF, and the likelihood of failure under seismic loading conditions would remain for the existing outlet works. Both of these conditions would continue to compromise the safety of the dam and expose people or structures to adverse geological risk (Impact GEO-1). This impact would therefore be significant and unavoidable.

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5.8 Greenhouse Gas Emissions

This section addresses potential impacts related to greenhouse gas (GHG) emissions that could result from Project implementation as they relate to climate change, defined as the systematic change in the long-term measurements of climate, such as temperature, pressure, and winds. Table 5.8-1 summarizes the conclusions of the analysis. Appendix C provides the summary emissions reports, including emissions data, factors, and calculations.

Table 5.8-1 Summary of Impacts on Greenhouse Gas Emissions

Impact	Project	Labyrinth Alternative	No Project	Mitigation Measures
Impact GHG-1: The Project would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.	Construction – L/Operation - O	Construction – L/Operation - O	Operation - O	None required
The Project would not increase the potential for conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of greenhouse gases.	Construction – O/Operation - O	Construction – O/Operation - O	Operation - O	None required

Note:

- O = No Impact
- L = Less than Significant Impact
- S = Significant Impact, but Mitigable to Less than Significant
- U = Significant Unavoidable Impact
- B = Beneficial Impact

5.8.1 Existing Conditions

Climate change refers to any measurable alteration in climatic conditions lasting for an extended period of time – several decades or longer – including changes in temperature, precipitation, and wind patterns. Over the past century, human activities have released large amounts of CO₂ and other GHGs into the atmosphere. The majority of GHGs are the by-product of burning fossil fuels to release energy in the form of heat, although deforestation, industrial processes, and some agricultural practices also emit GHGs into the atmosphere. GHGs trap solar energy in the atmosphere and cause it to warm. This phenomenon is called the greenhouse effect and is necessary to support life on Earth; however, excessive buildup of GHGs can change Earth's climate and result in undesirable effects on ecosystems, which affect human health and welfare (USEPA 2017a).

Average temperatures have risen across the contiguous 48 states since 1901, with an increased rate of warming over the past 30 years. Eight of the top ten warmest years on record have occurred since 1998. Average global temperatures show a similar trend, and all of the top ten warmest years on record worldwide have occurred since 1998. Within the United States, temperatures in parts of the North, the West, and Alaska have increased the most (USEPA 2017a). Seemingly small changes in the average temperature of the planet can translate to large and potentially hazardous shifts in climate and weather. Higher average temperatures are linked to changes in rainfall amounts and distribution that can result in flooding, droughts, or more frequent and severe heat waves. Also, oceans are warming and becoming more acidic, polar ice caps are melting, glaciers are receding, and sea levels are rising due to thermal expansion and ice loss. Late summer Arctic Ocean sea ice coverage has decreased, and glaciers have receded and lost significant mass since the 1970s (USEPA 2017a).

5.8.1.1 Greenhouse Gases

Gases that trap heat in the atmosphere are called GHGs. Principal GHGs include CO₂, methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride (SF₆), and other fluorinated gases including nitrogen trifluoride and hydrofluorinated ethers. GHGs occur naturally because of volcanoes, forest fires, and biological processes such as enteric fermentation and aerobic decomposition. They are also produced by combustion of fuels, industrial processes, agricultural operations, waste management, and land use changes, such as loss of farmland to urbanization. The most common GHG from human activity (primarily fuel combustion) is CO₂, followed by CH₄ and N₂O. Most GHGs persist in the atmosphere for a long time. Consequently, emissions accumulate in the atmosphere, resulting in higher atmospheric levels over time.

5.8.1.2 Emission Sources

The USEPA tracks GHG emissions in the U.S. and publishes the Inventory of U.S. Greenhouse Gas Emissions and Sinks, which is updated annually (USEPA 2017b). This detailed report contains estimates of the total national GHG emissions and removals associated with human activities in all 50 states. Based on the current report, the main source of GHG emissions in the U.S. is fossil fuel combustion, followed by non-energy sources of fuels.

5.8.2 Regulatory Framework

Regulations applicable to the project are described below.

5.8.2.1 Federal

There are no applicable federal regulations pertaining to GHG emissions.

5.8.2.2 State

5.8.2.2.1 Global Warming Solutions Act

In 2006 the California legislature passed the California Global Warming Solutions Act of 2006 (AB 32). AB 32 establishes upper limits on GHG emissions in California and outlines a regulatory framework to achieve the necessary reduction in emissions levels. Under AB 32, the CARB is directed to implement the act.

The purpose of this act is to reduce GHG emissions to 1990 levels by 2020. To achieve this goal, a number of key regulations have been implemented by the CARB, including the preparation and approval of the Climate Change Scoping Plan (Scoping Plan) that was approved in 2008 and has since been updated. The 2008 Scoping Plan presented key GHG reduction strategies, and a range of GHG reduction actions, including direct regulations, performance-based standards, technological requirements, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms. AB 32 requires the CARB to update the Scoping Plan every 5 years. The first update to the Scoping Plan was approved by the CARB in 2014.

5.8.2.2.2 Senate Bill 32

California Senate Bill (SB) 32 expands upon AB 32 and went into effect January 1, 2017. The bill requires that there be a reduction in GHG emissions to 40 percent below the 1990 levels by 2030. The CARB is responsible for ensuring that California meets this goal. A second update to the Scoping Plan, titled California's 2017 Climate Change Scoping Plan, was completed in November 2017, and outlines the strategy for achieving the SB 32 emissions reduction target. The 2017 Scoping Plan both builds upon the previous plans successes while identifying new strategies for meeting the GHG emissions reduction targets, with a continued focus on the State's largest stationary and mobile sources (CARB 2017b). The

provisions of SB 32 were added to Section 38566 of the Health and Safety Code subsequent to the bill's approval.

5.8.2.2.3 Senate Bill 1368

California SB 1368 adds Sections 8340 and 8341 to the Public Utilities Code (effective January 1, 2007) with the intent "to prevent long-term investments in power plants with GHG emissions in excess of those produced by a combined-cycle natural gas power plant" with the aim of "reducing emissions of GHGs from the state's electricity consumption, not just the state's electricity production." SB 1368 provides a mechanism for reducing the GHG emissions of electricity providers, both in state and out of state, thereby assisting CARB in meeting its mandate under AB 32, the Global Warming Solutions Act of 2006.

5.8.2.2.4 Senate Bill 97

California SB 97 directs the Office of Planning and Research to prepare, develop, and transmit to the Resources Agency CEQA guidelines for the feasible mitigation of GHG emissions or their effects by July 1, 2009. The Resources Agency was required to certify or adopt those guidelines by January 1, 2010. SB 97 also protects, for a short time, certain projects funded by the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006, or the Disaster Preparedness and Flood Protection Bond Act of 2006 (Proposition 1B or 1E) from claims of inadequate analysis of GHGs as a legitimate cause of action. This latter provision was repealed on January 1, 2010.

5.8.2.3 Local

The VCAPCD currently has no regulations specific to GHG emissions.

5.8.3 Impacts and Mitigation Measures

5.8.3.1 Significance Criteria

Appendix G of the CEQA Guidelines provides criteria to determine whether the Project would result in significant impacts related to GHG emissions. The criteria listed below consider if the Project would:

- a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
- b. Increase the potential for conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of greenhouse gases.

The VCAPCD currently has no adopted thresholds of significance for GHG emissions. Therefore, for the purpose of this GHG analysis, the South Coast Air Quality Management District's (SCAQMD; an adjacent air district) GHG significance threshold will be applied. The SCAQMD adopted an interim GHG significance threshold for stationary sources on December 5, 2008 of 10,000 metric tons (MT) of carbon dioxide equivalent (CO₂e) per year (SCAQMD 2008).

With regard to criterion b, as shown in Table 5.8-2 below, the Project would not be a significant contributor of GHG emissions. Furthermore, any emissions generated would be temporary and would cease upon completion of construction. As a result, the Project would be consistent with applicable plans, policies, or regulations aimed at reducing GHG emissions, including AB 32 and SB 32, therefore, no impact would occur during construction. Once operational, the Project's hydropower turbines would generate emissions from water movement and would not involve burning of fossil fuels and, thus, would not have any associated GHG emissions. Because the hydroelectric turbine replacement would not exceed emissions from a combined cycle natural gas power plant, the requirements of SB 1368 would be met. The Project would not increase the potential for conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of GHGs; therefore, no impacts would occur with respect to significance criterion b and it is not discussed further.

5.8.3.2 Proposed Project

Impact GHG-1: The Project would not generate GHG emissions, either directly or indirectly, that would have a significant impact on the environment (Construction - less than significant impact/ Operation – no impact).

Construction

Construction would result in a temporary increase in GHG emissions from engine exhaust during on-road vehicle and truck trips and off-road construction equipment operations. GHGs emitted would consist mainly of CO₂, with small amounts of CH₄ and N₂O. GHG emissions from construction-related activities were quantified using CalEEMod Version 2016.3.1. Project-specific information, including estimated construction schedule, construction equipment list, including type, quantity and duration of use, and vehicle and truck trip counts for each of the alternatives (GEI 2017a, 2017b, Catalyst 2018), were used to quantify GHG emissions in MT of CO₂e, which includes emissions of CO₂ plus CH₄ and N₂O as adjusted by their corresponding global warming potential. As specified in the GEI Constructability Analysis, the spillway modifications are planned to be constructed after the new outlet works facilities are in operation and therefore, the construction activities for the options would not occur concurrently. Generally, construction activities for the outlet works component is expected to occur in the late summer and take about two years to complete followed by construction of the spillway component which is expected to take another two years for a total of four years of construction. As a result, the estimated emissions for each of the options were quantified separately and do not require the annual emissions from the options to be summed.

Table 5.8-2 summarizes the annual GHG emissions from the Project’s construction-related activities for each of the outlet works (i.e., sloping intake and intake tower [Component 2]) and spillway (i.e., spillway widening and spillway deepening [Component 1]) design options along with the significance determination. With the exception of the outlet works intake tower option, each design option would span across three years, but the actual duration of construction would occur over two years. The intake tower option is expected to take three years to construct and would start in late summer and therefore span across a four-year period

Project component options would not exceed the significance threshold of 10,000 MT of CO₂e. Therefore, impacts on the environment from GHG emissions generated by the Project would be less than significant.

Table 5.8-2 Annual Construction-related GHG Emissions

Project Construction		CO ₂ e (MT)
Outlet Works with Sloping Intake Structure	Year 1	458
	Year 2	1,158
	Year 3	675
Outlet Works with Intake Tower	Year 1	454
	Year 2	1,177
	Year 3	1,305
	Year 4	152
Spillway Widening Option	Year 1	157
	Year 2	916
	Year 3	694
Spillway Deepening Option	Year 1	167
	Year 2	991

	Year 3	576
Annual Threshold		10,000
Significant?		No

Source: CalEEMod Annual Emissions Summary Report in Appendix C.

Operation

No impacts on GHG emissions would occur during operations and maintenance because they would remain unchanged from current conditions.

5.8.3.3 *Labyrinth Alternative*

Construction of the Labyrinth Alternative would be similar to Project Component 1. The annual GHG emissions from construction-related activities for the Labyrinth Alternative are identified in Table 5.8-3, along with the significance determination. With the exception of the outlet works intake tower option, each construction design option would span across three calendar years, but the actual duration of construction would occur over 2 years. The intake tower option is expected to take three years to construct and would start in late summer and therefore span across a four-year period. As shown, none of the annual GHG emissions would exceed the significance threshold. Therefore, impacts associated with this alternative would be the same as Project Impacts GHG-1 .

Table 5.8-3 Labyrinth Alternative Annual Construction-related GHG Emissions

Project Construction Option		CO ₂ e (MT)
Outlet Works with Sloping Intake Structure	Year 1	458
	Year 2	1,158
	Year 3	675
Outlet Works with Intake Tower	Year 1	454
	Year 2	1,177
	Year 3	1,305
	Year 4	152
Spillway Widening Option	Year 1	152
	Year 2	1,054
	Year 3	1,0007
Spillway Deepening Option	Year 1	169
	Year 2	1,090
	Year 3	888
Threshold		10,000
Significant?		No

Source: CalEEMod Annual Emissions Summary Report in Appendix C.

5.8.3.4 *No Project Alternative*

No increases in GHG emissions would result from the No Project Alternative because no construction would occur, nor would any changes in operations and maintenance be implemented. Therefore, no impacts would occur.

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5.9 Hazards and Hazardous Materials

This section describes the environmental and regulatory setting of hazards and hazardous materials in the Project area and discusses potential impacts on these resources from the Project and alternatives. Impacts from geologic hazards and flooding are discussed in Section 5.7, Geology and Soils, and Section 5.10, Hydrology and Water Quality, respectively. Impacts on government facilities, including those for fire, emergency response, and police protection are addressed in Section 5.15, Public Services. The study area for this section is the footprint of the Santa Felicia Dam and adjacent construction sites. Table 5.9-1 summarizes the potential impacts on hazards and hazardous materials that would result from implementation of the Project and alternatives.

Table 5.9-1 Summary of Impacts on Hazards and Hazardous Materials

Impact	Project	Labyrinth Alternative	No Project Alternative	Mitigation Measures
Impact HZ-1: The Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials	Construction – L/Operation - ○	Construction - L/Operation - ○	Operation - ○	MM HZ-1: Develop environmental awareness plan
Impact HZ-2: The Project could 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	Construction – S/Operation - ○	Construction – S/Operation - ○	Operation - ○	MM HZ-1: Develop environmental awareness plan
Impact HZ-3: The Project is not located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment	Construction – S/Operation - ○	Construction – S/Operation - ○	Operation - ○	MM HZ-2: Develop contaminated soil/ground-water contingency plan
Impact HZ-4: The Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan	Construction – L/Operation - ○	Construction – L/Operation - ○	Operation - ○	None required
Impact HZ-5: The Project could expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands	Construction – S/Operation - ○	Construction – S/Operation - ○	Operation - ○	MM HZ-3: Develop fire control and emergency response plan
The Project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school	Construction – O/Operation - ○	Construction – O/Operation - ○	Operation - ○	None required

Impact	Project	Labyrinth Alternative	No Project Alternative	Mitigation Measures
The Project is not located within an airport land use plan, or where such a plan has not been adopted, within two miles of a public airport or a public use airport, and would not result in a safety hazard for people residing or working in the Project area	Construction – O/Operation – O	Construction – O/Operation – O	Operation – O	None required
The Project is not located within the vicinity of a private airstrip, and would not result in a safety hazard for people residing or working in the project area	Construction – O/Operation – O	Construction – O/Operation – O	Operation – O	None required

Note:

- O = No Impact
- L = Less than Significant Impact
- S = Significant Impact, but Mitigable to Less than Significant
- U = Significant Unavoidable Impact
- B = Beneficial Impact

5.9.1 Existing Conditions

5.9.1.1 Site Location

The Project area is located in a rural area in unincorporated Ventura County. Specifically, the site is located in the central portion of Section 3, Township 4 North, Range 18 West, San Bernardino Baseline and Meridian. The site is situated along the south flank of the Topa Topa Mountains at an elevation ranging from approximately 960 feet msl at the UWCD maintenance facilities below the dam to 1,055 feet msl at the crest of the dam. At the Project site surface topography slopes down to the south towards Piru Creek. In the lower Piru Creek watershed area surface topography slopes down to the southwest towards the Santa Clara River.

The site is located adjacent to the northern-most portion of the Piru Groundwater Basin (refer to Section 5.10, Hydrology and Water Quality). Based on borehole data at the UWCD facility located immediately southwest from the Santa Felicia Dam spillway, depth to groundwater is greater than 80 feet below ground surface (Applied Environmental Services 2005).

No schools, airports, or airstrips are located within two miles of the site.

5.9.1.2 Hazardous Materials

A “hazardous material” is defined as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment (California Health and Safety Code, Chapter 6.95, Section 25501(o)). Per Title 22 of the CCR, Division 4.5, Chapter 11, materials and waste may be considered hazardous if they exhibit one or more of the following characteristics: ignitability (can be ignited by open flame); corrosivity (corrode other materials); reactivity (react violently, explode, or generate vapors when mixed with water); or toxicity (are poisonous). Hazardous materials have the potential to leach into soils, surface water, and groundwater when spilled or released, causing soil, water, or groundwater contamination. Soils possessing contamination levels in excess of governmental thresholds for certain substances must be treated as hazardous waste during their excavation, transport, and disposal. For this reason, the handling, transport, and disposal of hazardous materials is heavily regulated by policies from agencies at the Federal, State, and local levels in order to protect humans and the environment from exposure to hazards associated with accidental spills or releases.

5.9.1.3 Cortese List Sites

State of California Government Code Section 65962.5 (often referred to as the “Cortese List”) is composed of the SWRCB’s Geotracker database, solid waste disposal sites list, Cease and Desist Orders list and Cleanup and Abatement Orders list. The California Department of Toxic Substance Control’s (DTSC’s) EnviroStor database and hazardous waste sites comprise the Cortese List. A review of the Cortese List sources identified one former Leaking Underground Storage Tank (LUST) site at the UWCD facilities located immediately southwest from the Santa Felicia Dam spillway. This site was identified as a LUST site on August 21, 2003. The LUST was identified as a former 550-gallon gasoline tank that resulted in soil impacts in the immediate vicinity of the tank and associated dispenser. Remediation of the site began in December 2004 and was completed by August 2005. The site was closed and issued a No Further Action Letter by the Ventura County Environmental Health Division on September 16, 2005 (Applied Environmental Technologies, Inc. 2017). No other SWRCB Geotracker sites, solid waste disposal sites, Cease and Desist Orders sites, Cleanup and Abatement Orders sites, DTSC EnviroStor, or hazardous waste sites were identified within 1,000 feet of the Santa Felicia Dam (DTSC 2017).

5.9.1.4 Emergency Response Plans

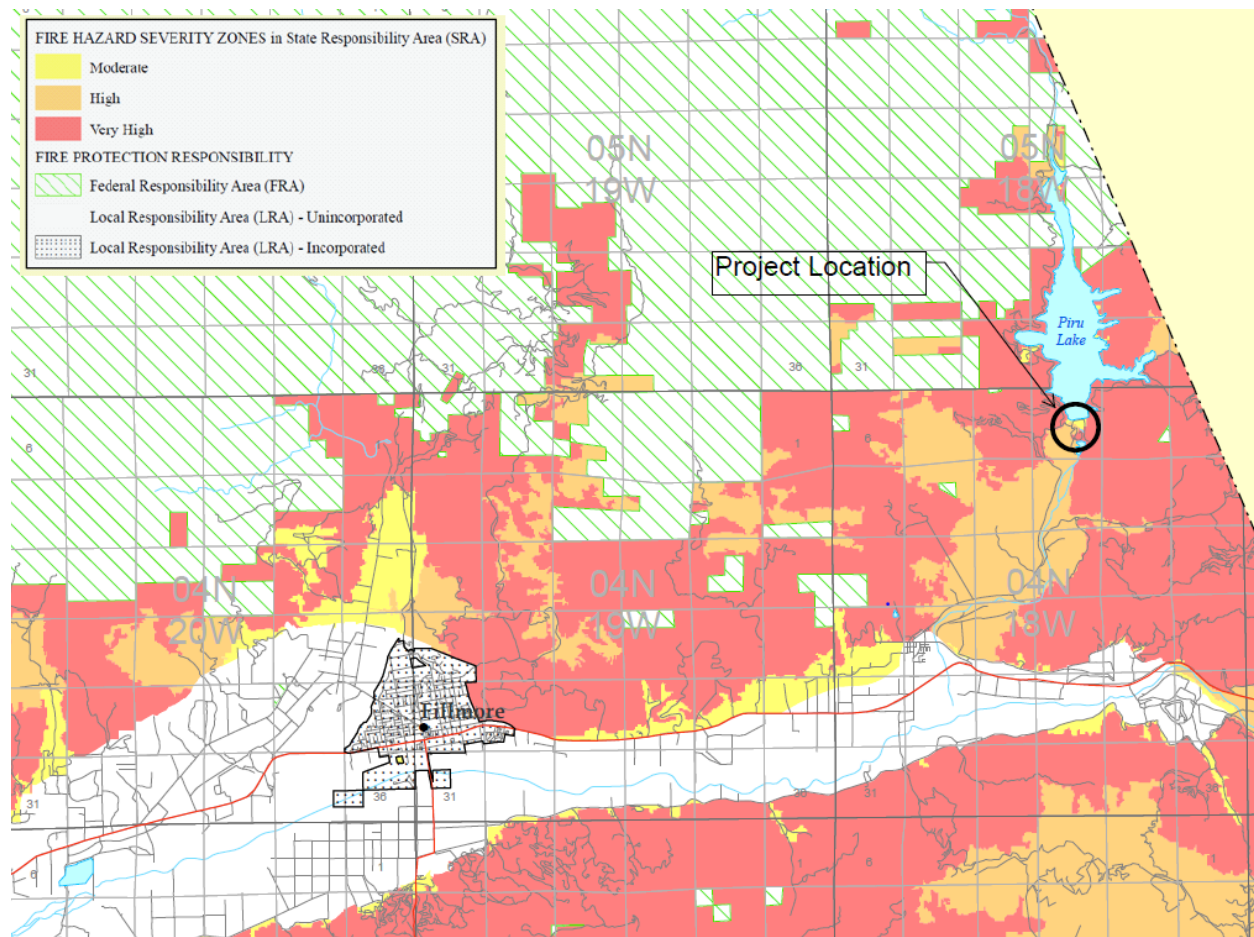
Ventura County has developed and implemented several emergency response plans to prepare and organize responses to natural and human-caused disasters. Emergency responses and evacuation plans that apply to the proposed Project include the Ventura County Multi-Hazard Mitigation Plan (AECOM 2015) and Ventura County General Plan Hazards Appendix (Ventura County 2013). Daily administration of the disaster preparedness and response programs for these areas is handled by the Ventura County Sheriff’s Office of Emergency Services. There are no specific emergency response routes identified for the Project area although Piru Canyon Road serves as the primary access route to/from the site. Further detail regarding emergency response is provided in Section 5.15, Public Services.

5.9.1.5 Fire Hazards

Ventura County experiences annual cycles of elevated wildland fire danger. Wildland fires resulting from either natural (e.g., lightning) or anthropogenic (e.g., cigarettes dropped in dry brush) causes can ignite and spread quickly, destroying the natural landscape and threatening the lives and personal property of residents located in wildfire-prone areas.

The California Department of Forestry and Fire Protection (CAL FIRE) is the State agency responsible for fire protection in State Responsibility Areas of California and also identifies and maps fire risks in State Responsibility Areas, Federal Responsibility Areas, and Local Responsibility Areas. CAL FIRE identifies five types of fire hazard severity (extreme, very high, high, moderate, and little or no threat) and issues recommendations for Very High Fire Hazard Severity Zones. In January 2008, CAL FIRE updated these Fire Hazard Severity Zone (FHSZ) maps to reflect revised Very High FHSZ for Local Responsibility Areas throughout California. Ventura County participated in this update to ensure the accuracy of mapped areas within its Local Responsibility Area. The FHSZs are shown in Figure 5.9-1. The Project area is designated as a Very High Fire Hazard Severity Zone.

In the Project area, elevated wildland fire risk is associated with the area’s low annual precipitation rate, highly flammable native vegetation, and susceptibility to high velocity “sundowner” and “Santa Ana” winds that occur predominantly during late summer and fall. These dry and windy conditions make the area between Los Angeles and Santa Barbara highly susceptible to ignition, and in recent years several large wildland fires have occurred, requiring responses by firefighting agencies.



Source: CAL FIRE 2007

Figure 5.9-1 Fire Hazard Severity Zones in Vicinity of the Santa Felicia Dam

5.9.2 Regulatory Framework

5.9.2.1 *Federal*

5.9.2.1.1 **Comprehensive Environmental Response, Compensation, and Liability Act**

The Comprehensive Environmental Response, Compensation, and Liability Act, also known as Superfund, outlines regulations for cleanup of toxic waste sites nationwide. In 1986, Superfund was amended by the Superfund Amendment and Reauthorization Act Title III, also known as the Emergency Planning and Community Right-to-Know Act (42 U.S.C. Section 11001 et seq). This Act and the Clean Air Act of 1990 established a nationwide emergency planning and response program and imposed reporting requirements for businesses that store, handle, or produce significant quantities of extremely hazardous materials. These acts require states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such material is stored or handled at a facility.

5.9.2.1.2 **Solid Waste Disposal Act/Resource Conservation and Recovery Act (42 U.S.C. Section 6901 et seq)**

The Resource Conservation and Recovery Act (RCRA) is a Federal program established to regulate solid and hazardous waste management. RCRA amends earlier legislation (the Solid Waste Disposal Act of 1965), but the amendments were so comprehensive that the act is commonly called RCRA rather than the Solid Waste Disposal Act. RCRA defines solid and hazardous waste; authorizes USEPA to set standards applicable to the owners and operators of hazardous waste treatment, storage and disposal

facilities; for hazardous waste generators and transporters, establishes a permit program for hazardous waste treatment, storage, and disposal facilities; and authorizes USEPA to set criteria for disposal facilities that accept municipal solid waste and other solid waste. RCRA was last reauthorized by the Hazardous and Solid Waste Amendments of 1984. The amendments set deadlines for permit issuance, prohibited the land disposal of many types of hazardous waste without prior treatment or a demonstration that land disposal will not result in hazardous waste migration, and established a new program regulating underground storage tanks. 40 CFR Part 260 contains the regulations promulgated by the USEPA to implement the requirements of RCRA as described above. Characteristics of hazardous waste are described in terms of ignitability, corrosivity, reactivity, and toxicity, and specific types of wastes are listed.

5.9.2.1.3 Toxic Substances Control Act (15 U.S.C. Section 2601-2692)

The Toxic Substances Control Act regulates the manufacture, use, management, and disposal of certain chemical products in the United States including polychlorinated biphenyls. The USEPA developed regulations for PCBs at 40 CFR Part 761, which include:

- > Restrictions on the manufacture, importation, use in commerce, and disposal of materials containing polychlorinated biphenyls;
- > Standards for the labeling and marking of materials containing or contaminated with polychlorinated biphenyls; and
- > Requirements for the transportation, recordkeeping, and cleanup of surfaces and soils contaminated with polychlorinated biphenyls.

5.9.2.1.4 Spill Prevention, Control, and Countermeasure Rule (40 CFR Part 112)

The Spill Prevention, Control, and Countermeasure (SPCC) rule includes requirements for oil spill prevention, preparedness, and response to prevent oil discharges to navigable waters and adjoining shorelines. The rule requires specific facilities to prepare, amend, and implement SPCC Plans. The SPCC rule is part of the Oil Pollution Prevention regulation, which also includes the Facility Response Plan rule.

5.9.2.1.5 Risk Management Program

Under the authority of CAA Section 112(r), the Chemical Accident Prevention Provisions 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 USEPA. Applicable facilities were initially required to comply with the rule in 1999, and the rule has been amended on several occasions since then, most recently in 2004.

5.9.2.1.6 U.S. Department of Justice, Bureau of Alcohol, Tobacco, and Firearms, and Explosives Regulations (27 CFR, Part 55 Subpart K)

These regulations include storage requirements to ensure the safe storage of explosives and the prevention of accidental explosions.

5.9.2.1.7 Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. Section 136 et seq)

Under the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. Section 136 et seq., all pesticides distributed or sold in the United States must be registered and most pesticides may only be used by a licensed applicator. Some pesticide-related wastes are considered as hazardous waste under RCRA.

5.9.2.1.8 Occupational Safety and Health Administration

The Occupational Safety and Health Administration administers Occupational Safety and Health Standards (29 CFR Sections 1910 and 1926) that: 1) provide regulations for safety in the workplace; 2) regulate construction safety; and 3) require a Hazard Communication Plan to identify and inventory all hazardous materials and material safety data sheets. The Occupational Safety and Health Administration's standards also require employee training in safe handling of hazardous materials.

5.9.2.2 State

5.9.2.2.1 California Code of Regulations, Title 22, Chapter 11

CCR Title 22, Division 4.5, Chapter 11 contains regulations for the identification and classification of hazardous wastes. This code defines a waste as hazardous if it has any of the following characteristics: ignitability, corrosivity, reactivity, or toxicity. Article 3 provides detailed definitions of each characteristic. Articles 4 and 5 provide lists of RCRA hazardous wastes, non-RCRA hazardous wastes, hazardous wastes from specific sources, extremely hazardous wastes, hazardous wastes of concern, and special wastes.

5.9.2.2.2 California Health and Safety Code

The CEQA Guidelines define "extremely hazardous substances" as those defined by Section 25532(2)(g) of the California Health and Safety Code. Appendix A of Part 355 (commencing with Section 355.10) of Subchapter J of Chapter I of Title 40 of the CFR provides a list of extremely hazardous substances and their threshold planning quantities.

The CEQA Guidelines define "hazardous air emissions" as emissions of air contaminants identified as toxic by the CARB or the designated air pollution control officer. These include substances identified in Section 44321(a to f) of the California Health and Safety Code.

Section 25150.7 of the California Health and Safety Code outlines procedures and regulations for the management and disposal of treated wood waste. Wood waste, including the type of wood utility poles that would be disposed as part of the proposed project, may be treated with preservatives and other chemicals to protect the wood. Because the chemical treatments could leach into water supplies when disposed of, Section 25150.7 was developed to restrict how and where treated wood waste can be disposed.

5.9.2.2.3 Government Code Section 65962.5: Cortese List

The Cortese List includes all hazardous waste facilities subject to corrective action; land designated as hazardous waste property or border zone property; information received by the DTSC about hazardous waste disposals on public land; sites listed pursuant to Section 25356 of the Health and Safety Code (removal and remedial action sites); and sites included in the Abandoned Site Assessment Program. Pursuant to Government Code Section 65962.5, the DTSC compiles and updates the Cortese List as appropriate, but at least annually.

5.9.2.2.4 Hazardous Waste Control Act

The Hazardous Waste Control Act established the State hazardous waste management program, which is similar to, but more stringent than, RCRA program requirements. CCR, Title 26 describes the requirements for the proper management of hazardous waste under the Hazardous Waste Control Act, including the following:

- > Identification and classification;
- > Generation and transportation;
- > Design and permitting of recycling, treatment, storage, and disposal facilities;

- > Treatment standards;
- > Operation of facilities and staff training; and
- > Closure of facilities and liability requirements.

These regulations list more than 800 materials that may be hazardous and establish criteria for the identification, packaging, and disposal of such waste. Under the Hazardous Waste Control Act and Title 26, the generator of hazardous waste must document waste from generation to transporter to disposal. Copies of this documentation must be filed with the DTSC.

The DTSC operates programs to protect California from exposure to hazardous wastes through the following practices and procedures:

- > Handling of the aftermath of improper hazardous waste management by overseeing site cleanup;
- > Prevention of the release of hazardous waste by ensuring that those who generate, handle, transport, store, and dispose of wastes do so properly;
- > Enforcement against those who fail to appropriately management hazardous wastes;
- > Exploration and promotion of measures to prevent pollution and encourage reuse and recycling;
- > Evaluation of site-specific soil, water, and air samples and the development of new analytical methods;
- > Practice in other environmental sciences, including toxicology, risk assessment, and technology development; and Involvement of the public in the DTSC's decision making.

5.9.2.2.5 Emergency Services Act

Under the Emergency Services Act, California developed an emergency response plan to coordinate emergency services provided by Federal, State, and local agencies. Rapid response to incidents involving hazardous material or hazardous waste is an important segment of the plan administered by the California Emergency Management Agency (CalEMA). CalEMA coordinates the response of agencies that include the California Environmental Protection Agency, Caltrans, CHP, RWQCBs, air quality management districts, and county disaster response offices.

5.9.2.2.6 California Occupational Health and Safety Administration

The California Occupational Health and Safety Administration (Cal/OSHA) is responsible for the development and enforcement of workplace safety standards and ensuring worker safety in the handling and use of hazardous materials. Cal/OSHA requires businesses to prepare Injury and Illness Prevention Plans and Chemical Hygiene Plans. The Cal/OSHA Hazards Communication Standard requires that workers be informed of the hazards associated with the materials they handle. Manufacturers are required to label containers, provide Material Safety Data Sheets in the workplace, and provide worker training.

5.9.2.2.7 California Public Resources Code

The California PRC includes fire safety regulations that restrict the use of equipment that may produce a spark, flame, or fire; require the use of spark arrestors on construction equipment that has an internal combustion engine; specify the requirements for the safe use of gasoline-powered tools in fire hazard areas; and specify fire suppression equipment that must be provided onsite for various types of work in fire-prone areas.

5.9.2.2.8 Government Code Section 50391(d) and (e)

According to California Government Code Section 53091(d) and 53091 (e), as a water storage/recharge facility, the project would be exempt from the land use policies and zoning ordinances of a county or city, including the provisions contained in the Ventura County General Plan and Zoning Ordinance.

Per California Government Code Section 53091(d):

Building ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, wastewater, or electrical energy by a local agency.

Additionally, California Government Code Section 53091(e) establishes that:

Zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code, or electrical substations in an electrical transmission system that receives electricity at less than 100,000 volts. Zoning ordinances of a county or city shall apply to the location or construction of facilities for the storage or transmission of electrical energy by a local agency, if the zoning ordinances make provision for those facilities.

5.9.2.3 Local

5.9.2.3.1 California Standardized Emergency Management System

The California State Legislature passed Senate Bill 1841, with the intent of improving the coordination of State and local responses during disaster incidents. Under Senate Bill 1841, the Office of Emergency Services was required to establish the Standardized Emergency Management System (SEMS) in coordination with State and local agencies. The SEMS system provides a common management structure and language to aid in coordination between agencies and local governments. The SEMS system also established a master mutual aid agreement and program. Local governments are required to use SEMS in order to be eligible for State funding for emergency response services.

5.9.2.3.2 Certified Unified Program Agency

Administration of the Certified Unified Program Agency (CUPA) is authorized by the California Health and Safety Code (Chapter 6.11, Sections 25404-25404.8) and CCR (Title 27, Division 1, Subdivision 4, Chapter 1, Sections 15100–15620). The CUPA is implemented at the local level by government agencies certified by the secretary of the California Environmental Protection Agency. The CUPA consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of environmental and emergency response programs such as Uniform Fire Code Article 80 Hazardous Materials Business Plans, SPCC Plans, and Hazardous Waste Generator and Onsite Hazardous Waste Treatment Program permits. The Ventura County Environmental Health Division is the jurisdictional CUPA in the proposed project area.

5.9.2.3.3 Ventura County General Plan

Although Santa Felicia Dam is located within unincorporated Ventura County, it is exempt from County permit requirements because it is a water storage and power generation facility, regulated by a license issued by FERC under the Federal Powers Act. Therefore, the Project is not subject to the provisions of the Ventura County General Plan (Ventura County 2016a) or other local ordinances, regulations, or policies. The relevant goals and policies to fire hazards, transportation and related hazards, and hazardous materials from the Ventura County General Plan (Ventura County 2016a) are provided as follows for informational purposes:

1. Minimize the risk of loss of life injury, damage to structures, and economic and social dislocations resulting from fire hazards. (Section 2.13.1)
2. Ensure that development in high fire hazard areas is designed and constructed in a manner that minimizes the risk from fire hazards. (Section 2.13.1)
3. Minimize the loss of life, injury, damage to structures, and economic and social dislocations resulting from hazards created by proximity to airports, railroads and truck routes. (Section 2.14.1)
4. 2. To reduce or mitigate the effects of marine oil spills or onshore oil pipeline spills upon the population and environment. (Section 2.14.1)
5. Minimize the risk of loss of life, injury, serious illness, damage to property, and economic and social dislocations resulting from the use, transport, treatment and disposal of hazardous materials and hazardous wastes. (Section 2.15.1)
6. Locate potentially hazardous facilities and operations in areas that would not expose the public to a significant risk of injury, loss of life, or property damage. (Section 2.15.1)

While not directly applicable, the Project is consistent with these goals as its objective is to improve the safety of Santa Felicia Dam by ensuring that the spillway can safely convey the outflow from the regulatory IDF and that the outlet works can withstand seismic loading from the MCE.

5.9.2.3.4 Piru Area Plan

The Piru Area Plan (Ventura County 2011) includes goals and policies pertaining to hazards and hazardous materials; however, as discussed above, the Project is not subject to the provisions of the Piru Area Plan or other local ordinances, regulations, or policies since it is a State water storage and power generation facility, regulated by a license issued by FERC under the Federal Powers Act.

5.9.2.3.5 Ventura County Code of Ordinances

Per the Ventura County Fire Protection District Ordinance Number 27, M103, fire officials may restrict entry to public lands during wildfires. The fire code official is authorized to determine and publicly announce when Wildland Urban Interface zone or FHSZ areas shall be closed to entry and when the areas should be reopened. Entry into and occupation of Wildland Urban Interface or FHSZ areas is prohibited, except for public roadways, inhabited areas, or established trails and campsites that have not been closed when the Wildland Urban Interface or FHSZ area is closed to entry.

5.9.3 Impacts and Mitigation Measures

The evaluation of impacts of hazards and hazardous materials from construction and operation of the proposed Project was based on the review of relevant Federal, State, county, and local laws, regulations, plans (e.g., emergency response and hazard mitigation plans), policy documents, and standards, as well as hazards and hazardous materials that would be associated with construction, operation, and maintenance of the proposed Project components, as described in Chapter 3, Project Description. State, county, and local maps were reviewed to determine the location of proposed Project components in proximity to schools, known hazardous materials sites, airports, and fire severity zones as classified by CALFIRE. The results of Cortese List database searches for known hazardous materials sites were reviewed as described in Section 5.9.1.3, Cortese Sites.

5.9.3.1 *Significance Criteria*

UWCD reviewed Appendix G of the CEQA Guidelines to determine whether the Project or alternatives would result in significant impacts related hazards and hazardous materials. The criteria listed below consider if the Project would:

- a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.
- c. Be located on a site which is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5, and as a result, would it create a significant hazard to the public or the environment.
- d. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.
- e. Expose people or structures to a significant risk of loss, injury, or death involving wild lands fire, including where wild lands are adjacent to urbanized areas or where residences are intermixed with wild lands.
- f. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.
- g. 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 a public use airport, would the project result in a safety hazard for people residing or working in the Project area.
- h. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the Project area.

Criteria a, b, c, d and e are relevant to the construction phase of the Project and are discussed in Section 5.9.3.2. Criterion f is not discussed further because the site is not located within 0.25 mile from an existing or proposed school. Criteria g and h also are not discussed further because the Project Site is not located within an airport land use plan, within two miles of a public airport or public use airport, or in the vicinity of a private airstrip.

5.9.3.2 Proposed Project

Impact HZ-1: The Project could create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials (Construction - less than significant/Operation – no impact).

Construction

Construction activities associated with the proposed Project would involve transport, use, and disposal of hazardous materials. This would include the use of hazardous materials typically used by construction vehicles and heavy equipment (e.g., gasoline, diesel fuel, transmission fluid, brake fluid, hydraulic fluid, solvents, motor oils, and lubricating grease), primarily within the immediate vicinity of the Project construction areas and at the adjacent project staging areas. Additionally, on a temporary basis, construction of the Project components would involve the use of other potentially hazardous materials, including welding materials, explosives for tunneling, propane, paints, canned spray paint, paint thinner, battery acid in the substation control rooms, and insect repellent. All hazardous materials would be used, transported, and disposed of in accordance with applicable regulations. Construction of the proposed Project would also potentially generate hazardous waste that would require disposal including petroleum hydrocarbons and asbestos- and lead paint-containing materials. Accidental discharge of hazardous materials or inappropriate disposal of hazardous materials during construction could result in a hazard to the public or the environment.

Construction projects that disturb one acre of land or more are required to obtain coverage under the NPDES General Construction Permit. UWCD would prepare a SWPPP in compliance with Section 402 of the Federal CWA and would file a Notice of Intent with the SWRCB to obtain coverage under the SWRCB NPDES General Construction Permit (Order 2009-0009-DWQ as amended by 2010-0014-DWQ and

2012-0006-DWQ). The SWPPP would include spill prevention measures to avoid and, if necessary, clean up accidental releases of hazardous materials. Compliance with all NPDES Construction General Permit requirements including the preparation and implementation of a SWPPP and associated BMPs would minimize the potential for mishandling and/or the release of hazardous materials. Therefore, construction of the Project would not result in significant hazards to the public or the environment, and impacts would be less than significant. In addition, to further minimize the potential hazards to the public or the environment associated with hazardous materials, MM HZ-1 will be implemented to ensure that all parties involved in Project construction are aware of the potential hazards and properly trained to address them.

Operation

Existing dam operations would not change following Project construction; therefore, there would be no impact to hazards and hazardous materials from Project operation.

Mitigation Measures

MM HZ-1: Worker Environmental Awareness Plan (WEAP). UWCD shall develop a WEAP to expand the utility of the SWPPP in reducing the significance of Impact HZ-1. UWCD would also prepare a presentation used to train all site personnel prior to the commencement of work. A record of all trained personnel would be kept. In addition to instruction on compliance with any mitigation measures identified, all construction personnel would also receive the following:

- > A list of phone numbers for the UWCD environmental specialist personnel associated with the Project (archaeologist, biologist, environmental compliance coordinator, and spill response coordinator).
- > Instruction regarding the individual responsibilities under the CWA, the Project SWPPP, site-specific BMPs, and the location of Material Safety Data Sheets for the Project.
- > Instructions to notify the foreman and spill response coordinator in case of a hazardous materials spill or leak from equipment, or upon the discovery of soil or groundwater contamination.
- > A copy of the truck routes to be used for material delivery.
- > Instruction that noncompliance with any laws, rules, regulations, or mitigation measures could result in being barred from participating in any remaining construction activities associated with the Project.
- > Emergency response measures and routes.

Residual Impacts

Implementation of MM HZ-1 safety measures and staff training would reduce the potential of the proposed Project to create a significant hazard through the routine transport, use, and disposal of hazardous materials. Specifically, providing staff with training on correct implementation of the SWPPP, BMPs, and appropriate response procedures will reduce the likelihood and magnitude of hazards and exposure to hazardous materials during construction. As such, impacts during construction due to hazards and hazardous materials would be less than significant.

Impact HZ-2: The Project could 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 (Construction - significant impact but mitigable to less than significant, Operation – no impact).

Construction

Compliance with all NPDES Construction General Permit requirements including the preparation and implementation of a SWPPP and associated BMPs, would minimize the potential for the release of hazardous materials. However, as described in the impact evaluation for Impact HZ-1, accidental discharge of hazardous materials or inappropriate disposal of hazardous materials during construction could result in a hazard to the public or the environment. In the event of a spill, impacts could be

significant. Implementation of MM HZ-1, would require that Material Safety Data Sheets are provided to onsite personnel for hazardous materials that would be present at the construction site as well as the require that all staff undergo WEAP training that would include instructions in case of a spill or release of hazardous materials, and would comply with applicable laws and regulation regarding the use, transportation, and disposal of hazardous materials. Implementation of MM HZ-1 would reduce impacts associated the potential hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment to less than significant.

Operation

Existing dam operations would not change following Project construction; therefore, there would be no impact to hazards and hazardous materials from Project operation.

Mitigation Measures

MM HZ-1: Worker Environmental Awareness Plan. UWCD shall develop a WEAP, as described above.

Residual Impacts

Implementation of MM HZ-1 requires UWCD to provide Material Safety Data Sheets, which specify chemical hazards, to project construction crews and UWCD personnel for hazardous materials that would be present at the project construction site. In addition, MM HZ-1 requires that all staff undergo WEAP training that would include instructions in case of a spill or release of hazardous materials, and would comply with applicable laws and regulations regarding the use, transportation, and disposal of hazardous materials. Implementation of MM HZ-1 safety measures and staff training would reduce the potential of the proposed Project to create a significant hazard through reasonably foreseeable upset and accident conditions. As such, impacts during construction under Impact HZ-1 this criterion would be less than significant.

Impact HZ-3: The Project is 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, could create a significant hazard to the public or the environment (Construction - significant impact but mitigable to less than significant, Operation – no impact).

Construction

As described in Section 5.9.1.3, Cortese List Sites, the results of Cortese List (Government Code Section 65962.5) database searches identified one closed LUST site that has been remediated with no further action required. The database search did not identify any other SWRCB Geotracker sites, solid waste disposal sites, sites with Cease and Desist Orders or Cleanup and Abatement Orders, or DTSC EnviroStor or hazardous material sites within 1,000 feet of components of the proposed Project. During construction activities, UWCD or its contractor may encounter subsurface structures, such as pipelines or unknown/undetected storage tanks, or materials resulting in a release of contaminants such as lead, asbestos, pesticides, or fuel that may be associated with past uses. The spread of discovered contaminants could result in a significant impact. MM HZ-2 would require a contingency plan to address unanticipated discoveries of contaminated material and would reduce the impacts associated with such discoveries to a less than significant level through the establishment of appropriate response measures and procedures to protect workers and minimize exposure to the public and environment to hazardous materials.

Operation

Existing dam operations would not change following Project construction; therefore, there would be no impact to hazards and hazardous materials from Project operation.

Mitigation Measures

MM HZ-2: Contaminated Soil/Groundwater Contingency Plan. UWCD shall prepare a Contaminated Soil/Groundwater Contingency Plan prior to start of construction to address unanticipated unearthing or exposure of buried hazardous materials or contamination or contaminated groundwater. The final Contaminated Soil/Groundwater Contingency Plan shall be implemented, as specified, throughout construction and restoration. This plan shall detail steps that UWCD or its contractor will take to prevent the spread of contamination, the sampling necessary if contamination is discovered, and remedial action. At minimum, the plan shall include the following:

1. Contact information and procedures for Federal, regional, and local agencies; the applicant's environmental coordinator(s) responsible for the cleanup of contaminated soil or groundwater; and licensed disposal facilities and haulers.
2. Procedures to minimize environmental impacts in the event that hazardous soils or other materials are encountered during construction, including stopping work; securing and marking the contaminated area; preventing the spread of contamination; testing; primary, secondary, and final cleanup procedures; and proper disposal in accordance with applicable laws and regulations.
3. Training requirements for construction workers performing excavation activities and identifying potentially hazardous contamination (e.g., stained or discolored soil and odor).

Residual Impact

MM HZ-2 would require UWCD to prepare and implement a Contaminated Soil/Groundwater Contingency Plan in case hazardous material is found on site. Although it is not anticipated that contaminated materials will be encountered, implementation of MM HZ-2 would reduce the potential to spread contaminated soils or waters, which would reduce impacts to a less than significant level.

Impact HZ-4: The Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan (Construction – less than significant, Operation – no impact).

Construction

The proposed Project would not require closure of any roadways during construction or maintenance activities. In addition, while Piru Canyon Road would serve as the access and egress to the Project, none of the access roads have been identified as part of an emergency response or evacuation plan. Accordingly, travel routes for emergency vehicles would remain unobstructed and adequate during both construction and operation phases of the proposed Project. Therefore, there would be less than significant impacts to adopted emergency response plans or emergency evacuation plans.

Operation

Existing dam operations would not change following Project construction; therefore, there would be no impact to hazards and hazardous materials from Project operation.

Impact HZ-5: The Project could expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands (Construction - significant impact but mitigable to less than significant, Operation – no impact).

Construction

The Project is located in an area that is designated by CAL FIRE as a Very High Fire Hazard Severity Zone (see Figure 5.9-1) due to flammable native vegetation, dry weather conditions, and high winds. Construction activities associated with the proposed Project would increase fire risk during refueling, vehicle and equipment use, welding, vegetation clearing, worker cigarette smoking, and other activities

which could result in a significant impact. Implementation of MM HZ-3 would require that fire prevention and response practices are implemented during construction and operation of the proposed Project to minimize the risk of fire and provide procedures for immediate suppression and response in the case that a fire does occur. Accordingly, implementation of MM HZ-3 would reduce impacts associated with wildland fires to less than significant.

Operation

Existing dam operations would not change following Project construction; therefore, there would be no impact to hazards and hazardous materials from Project operation.

Mitigation Measures

MM HZ-3: Fire Control and Emergency Response Plan. Prior to construction, UWCD shall develop and implement a Fire Control and Emergency Response Plan. The final Fire Control and Emergency Response Plan shall be implemented, as specified, throughout construction and restoration. This plan, and a record of contact and coordination with local fire departments, shall be completed prior to start of construction of the proposed Project. The plan shall describe fire prevention and response practices that UWCD will implement during construction and operation of the proposed Project to minimize the risk of fire and, in the case of fire, provide for immediate suppression and notification. The plan will include:

- > Fire prevention and response practices regarding the dispensing and storage of gasoline, diesel, and other fuels and combustible chemicals; power tool and equipment use; emergency access; fire suppression equipment and training; electrical grounding; and vegetation clearing; and
- > Communication protocols for on-site workers to coordinate with local agencies and emergency personnel and for the UWCD environmental health and safety personnel to coordinate with on-site workers in the event of fire, flood, or other emergencies or increased risk of emergency during construction or operation of the Project.

The plan shall define requirements for:

- > Designating on-site fire patrol personnel who will monitor fire prevention activities during construction and have full authority to stop construction to prevent fire hazards;
- > Reviewing the Fire Control and Emergency Response Plan with designated on-site fire patrol personnel and all other workers prior to commencing construction at each project area;
- > Confining welding or blowtorch activities to cleared areas having a minimum radius of 10 feet, measured from place of welding;
- > Prohibiting smoking at all work areas within High and Very High Fire Hazard Severity Zones as defined by CAL FIRE during construction of the Project;
- > Ensuring that all vehicles used for construction of the Project carry fire suppression equipment;
- > Requiring the use of spark arrestors;
- > Furnishing tools (e.g., shovels), equipment (e.g., fire extinguishers), and materials necessary to prevent fires, control the spread of fire if started, and providing assistance to extinguish fires started as a result of construction of the Project;
- > Providing the applicant's workforce and equipment to extinguish uncontrolled fire near project work areas as directed CAL FIRE or local fire department representatives; and
- > Ceasing any or all work activities, including helicopter use, as directed by the CAL FIRE or local fire department representatives in response to fire incidents.

Residual Impact

MM HZ-3 would require UWCD to develop a Fire Control and Emergency Response Plan. This plan would be developed in coordination with local fire departments and would identify fire prevention measures and response and communication protocols in the event of an emergency. Implementation of MM HZ-3 would reduce impacts associated with increased fire risk to less than significant levels.

5.9.3.3 Labyrinth Alternative

Under the Labyrinth Alternative, there would be a greater use of concrete and a longer construction schedule. However, the construction requirements and schedule would be generally the same as for the proposed Project. Accordingly, under this alternative, impacts associated with hazards and hazardous materials would be the same as those described for the proposed Project.

5.9.3.4 No Project Alternative

Under the No Action Alternative, there would be no improvements to the outlet works system or spillway at Santa Felicia Dam. Because construction would not occur and there would be no changes to existing dam operations, there would be no hazard-related impacts (other than seismic hazards and flooding identified in Section 5.7, Geology and Soils, and Section 5.10, Hydrology and Water Quality) associated with this alternative.

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5.10 Hydrology and Water Quality

This section describes water resources and geomorphology associated with the Project area, the regulations related to hydrology, geomorphology, and water quality in the Project area, and the potential impacts on these resources from the Project and Project alternatives. Impacts relative to erosion and siltation are also discussed in Section 5.7, Geology and Soils.

Table 5.10-1 Summary of Impacts on Hydrology and Water Quality

Impact	Project	Labyrinth Alternative	No Project Alternative	Mitigation Measures
Impact HWQ-1: The Project would not violate any water quality standards or waste discharge requirements.	Construction - L/ Operation - O	Construction - L/ Operation - O	Operation - O	None required.
Impact HWQ-2: The Project would substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.	Construction - L/ Operation - S	Construction - L/ Operation - S	Operation - O	MM-BIO-4 Design and Construct a Geomorphically Stable Channel
Impact HWQ-3: The Project would substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in flooding on- or off-site.	Construction - L/ Operation - S	Construction - L/ Operation - S	Operation - U	MM-BIO-4 Design and Construct a Geomorphically Stable Channel
Impact HWQ-4: The Project would result in a substantial reduction in geomorphic function (i.e., channel stability) in lower Piru Creek.	Construction - L/ Operation - S	Construction - L/ Operation - S	Operation - O	MM-BIO-4 Design and Construct a Geomorphically Stable Channel
Impact HWQ-5: The Project would not create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.	Construction - L/ Operation - O	Construction - L/ Operation - O	Operation - U	None required.
Impact HWQ-6: The Project would not otherwise substantially degrade water quality.	Construction - L/ Operation - O	Construction - L/ Operation - O	Operation - O	None required.
Impact HWQ-7: The Project would not reduce the capacity of flood control facilities and watercourses.	Construction - L/ Operation - L	Construction - L/ Operation - L	Operation - O	None required.
Impact HWQ-8: The Project would reduce exposure of people or structures to a significant risk of flooding because of dam or levee failure.	Construction - L/ Operation - B	Construction - L/ Operation - B	Operation - U	None required.
Impact HWQ-9: The Project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the	Construction - O/ Operation - O	Construction - O/ Operation - O	Operation - O	None required.

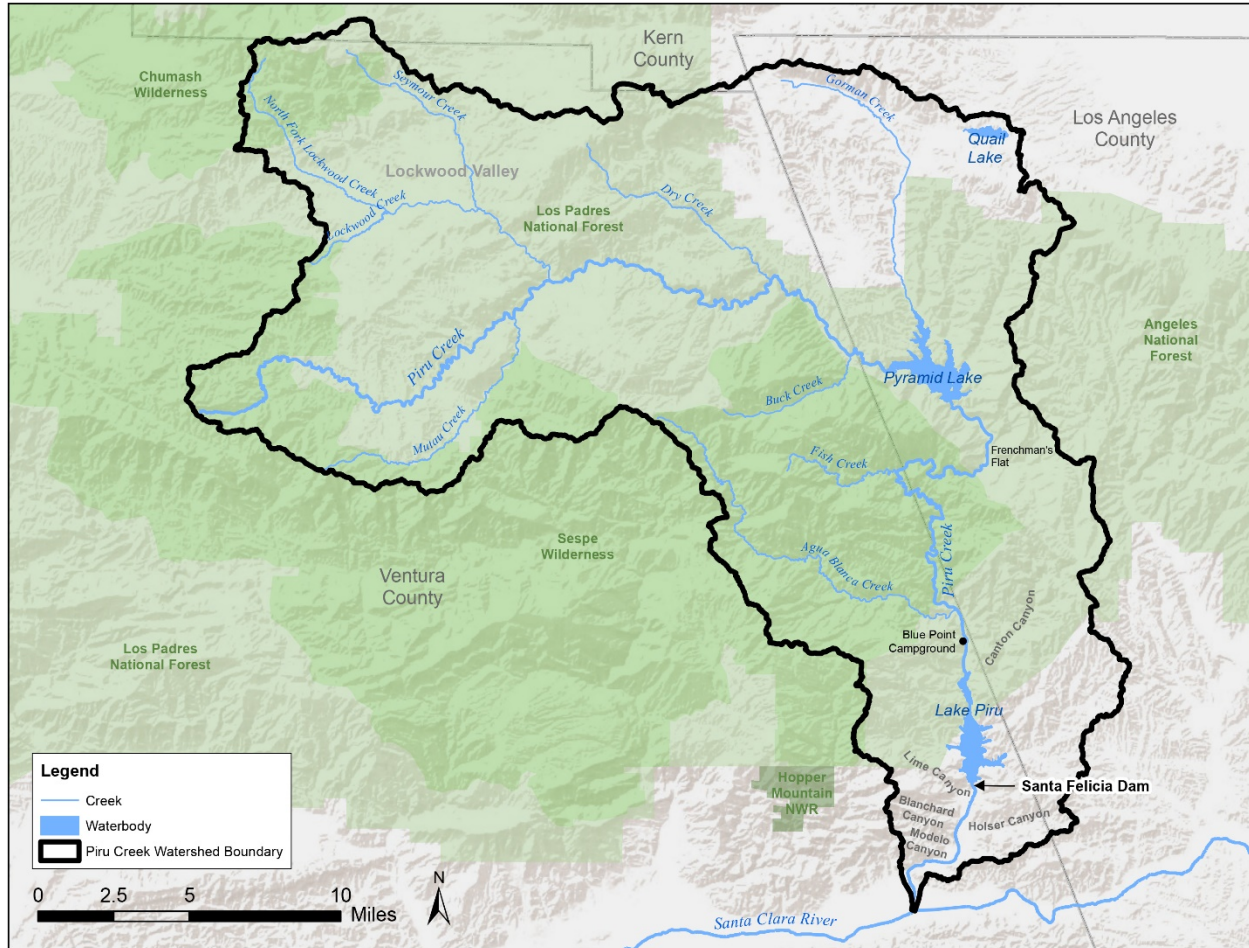
Impact	Project	Labyrinth Alternative	No Project Alternative	Mitigation Measures
production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted.				
The Project would not result in scouring of the riverbed and floodplain to the point of causing a substantial increase in the frequency and magnitude of scouring of riparian vegetation in lower Piru Creek	Construction - O/ Operation - O	Construction - O/ Operation - O	Operation - O	None required.
The Project would not place housing within a 100-year flood hazard area, as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.	Construction - O/ Operation - O	Construction - O/ Operation - O	Operation - O	None required.
The Project would not place within a 100-year floodplain structures which would impede or redirect flood flows.	Construction - O/ Operation - O	Construction - O/ Operation - O	Operation - O	None required.
The Project would not result in inundation by seiche or tsunami	Construction - O/ Operation - O	Construction - O/ Operation - O	Operation - O	None required.

Note:

- O = No Impact
- L = Less than Significant Impact
- S = Significant Impact, but Mitigable to Less than Significant
- U = Significant Unavoidable Impact
- B = Beneficial Impact

5.10.1 Existing Conditions

The Piru Creek watershed encompasses approximately 500 square miles with the majority of the watershed situated within Ventura County and smaller portions within Los Angeles and Kern Counties (Figure 5.10-1). Topographic relief in the watershed is significant, with the majority of the watershed covered by steep sided canyons and ridges and flat lands found in canyon bottoms and on top of ridgelines. Elevations within the watershed range from approximately 8,831 feet msl at the summit of Mount Pinos to approximately 647 feet msl at the confluence of Piru Creek with the Santa Clara River near the town of Piru, California.



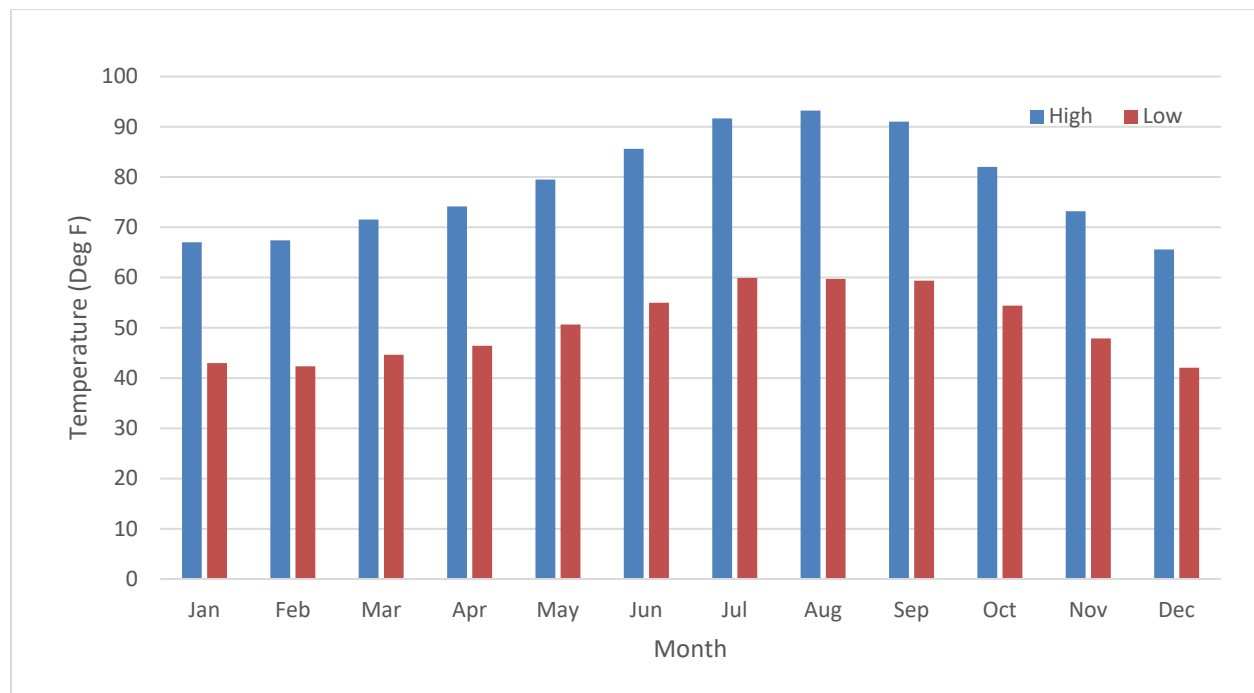
Source: USGS 2017a

Figure 5.10-1 Piru Creek Watershed

5.10.1.1 Climate

The Project is located in the Mediterranean climate zone of California, which extends from Central California to San Diego, and is characterized by wet winters and long dry summers. The topography of the region results in a great deal of spatial variation in the local climate. The proximity and steep rise of the Transverse mountain ranges from the coast creates a barrier that traps moist ocean air against the mountain slopes and partially blocks summer heat and winter cold from the interior northeast.

Figure 5.10-2 shows the variation in annual average monthly temperatures in the Project area over the available period of record between July 2001 and December 2017 at the Temescal LFP weather station (Station No. 045307) located at Lake Piru, California.



Source: Western Regional Climate Center 2017

Figure 5.10-2 Seasonal Variation of High and Low Temperatures

Most winter storms originate from the northwest and move southwest across Southern California. Summer rains are rare and are generally associated with tropical thunderstorms originating in the Gulf of Mexico or late summer hurricanes off the west coast of Mexico.

The annual rainfall in the Project area averages 19.63 inches as measured at Lake Piru Gage No. 160E between 1995 and 2017, with most precipitation falling between November and March. The average monthly distribution of rainfall is provided in Figure 5.10-3, ranging from 0.003 inch in August to 5.01 inches in February. For any given storm event, rainfall totals vary across the watershed. The highest recorded 24-hour rainfall at Lake Piru Reservoir between October 1994 and September 2017 was 6.54 inches on January 10, 2005 (UWCD 2017a).

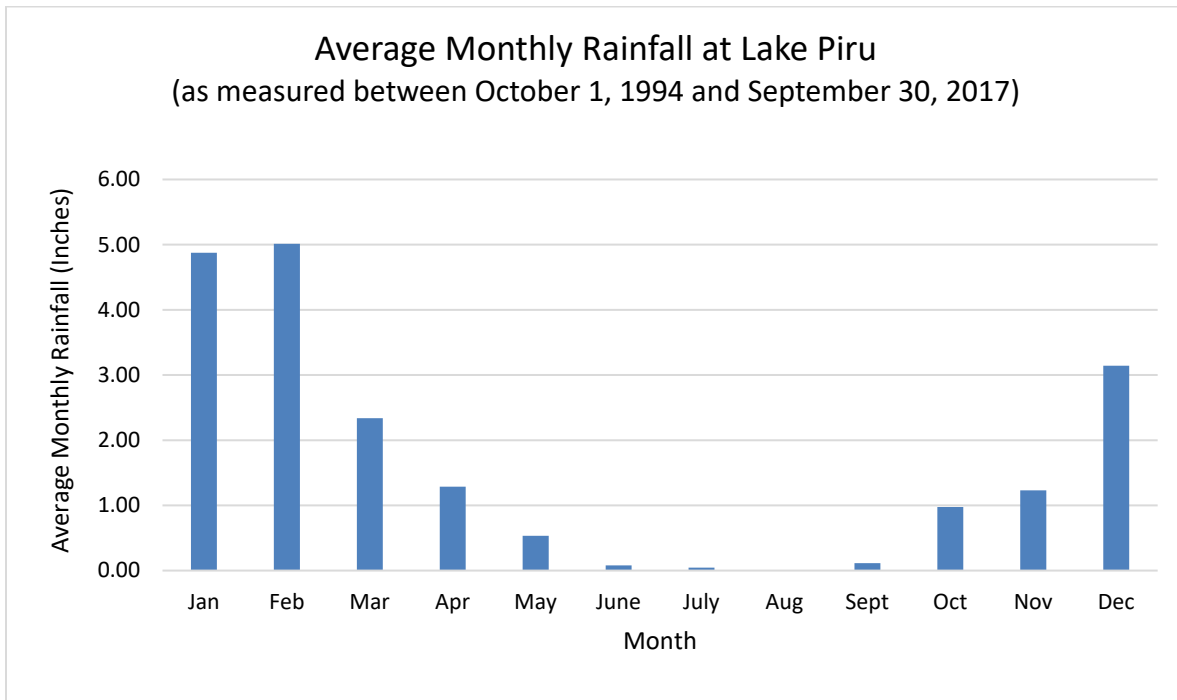
5.10.1.2 Hydrology – Piru Creek

The natural hydrology of Piru Creek was modified by the construction and operation of the Santa Felicia Project between 1954 and 1955 and the Pyramid Lake Project in 1972. Prior to the construction of these projects, the hydrology of Piru Creek was “flashy” with the highest flows occurring between January and April in response to seasonal storm events and the lowest flows occurring in July through October at the end of the dry season. Operation of the Santa Felicia and Pyramid Lake Projects has resulted in more consistent flows year-round and reduced peak flows in both middle Piru Creek (between Pyramid Lake and Lake Piru Reservoir) and lower Piru Creek (downstream of Lake Piru Reservoir) as discussed below.

Middle Piru Creek

Pyramid Lake has a drainage area of 295 square miles, a surface area of 1,297 acres, and a maximum storage capability of 171,200 acre-feet. Primary sources of water for Pyramid Lake are upper Piru Creek, the west fork of Liebre Gulch, Gorman Creek, and the west branch of the California Aqueduct from Castaic Lake. Pyramid Lake is part of the California State Water Project (SWP) and is operated by the

California Department of Water Resources (DWR). Below Pyramid Lake, Piru Creek flows south for approximately 19 miles before discharging into Lake Piru Reservoir.



Source: UWCD 2017a

Figure 5.10-3 Average Monthly Rainfall at Lake Piru Reservoir between October 1, 1994 and September 30, 2017

Releases from Pyramid Lake have typically provided consistent flows to the middle reach of Piru Creek during the summer. In 2005, the water release schedule from Pyramid Lake to middle Piru Creek was modified to mimic the natural, unregulated hydrograph, with some alteration to allow for the delivery of SWP water to UWCD (FERC 2007). The monthly discharge statistics at USGS Gage Station 11109600 for Piru Creek above Lake Piru Reservoir after construction of Pyramid Lake is provided in Table 5.10-2 (USGS 2017b).

The Santa Felicia Dam spillway was initially designed to pass a discharge of 105,000 cfs with five-feet of freeboard to the crest of the dam (elevation 1,075 feet msl). The initial design was considered adequate because it was 2.75 times greater than the largest recorded stream flow (March 2, 1938) at the Santa Felicia Dam site. Since the construction of Santa Felicia Dam, the maximum recorded reservoir water surface elevation was 1,061.45 feet msl on February 25, 1969, which corresponded to a spillway discharge of 28,800 cfs. During the 2004-2005 water year, the watershed experienced the highest precipitation since 1969, and the highest estimated inflow to Lake Piru Reservoir during this period was approximately 40,000 cfs (GEI 2015b). Peak inflow estimates to Lake Piru Reservoir were prepared based on data from USGS Gage Station 11109600 as well as modeled storm events between the 100-year and 1,000-year return periods (GEI 2015b). The results indicate 100-year recurrence interval flows of 68,800 cfs based on the analysis of USGS Gage Station 11109600 data and 142,800 cfs based on the modeled results using the estimated 72-hour precipitation data from NOAA Atlas 14 (GEI 2015b). The modeled 100-, 200-, 500-, and 1,000-year recurrence flow results are provided in Table 5.10-3.

Table 5.10-2 Middle Piru Creek (Piru Creek above Lake Piru Reservoir) - Monthly Discharge Statistics After Construction of the Pyramid Dam – 1974 to 2017 (USGS Gage Station 11109600)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Mean (cfs)	13.6	23.0	36.1	114.3	226.5	170.3	82.9	46.0	26.8	18.4	15.1	13.6
Median (cfs)	9.1	10.5	13	24.9	45	63	42.4	29	19	14	12	10
Max. (cfs)	170	147	1460	9020	15000	14000	2980	471	188	83	48	209
Min. (cfs)	0	0	1.4	1.4	3.4	4.4	1.8	0.9	0	0	0	0

Note: cfs – cubic feet per second

Source: USGS 2017b

Table 5.10-3 Middle Piru Creek (Piru Creek above Lake Piru Reservoir) – Flood Frequency Estimates

Flow Characteristics	Return Period (years)			
	100-Year Storm	200-Year Storm	500-Year Storm	1,000-Year Storm
72-hour Precipitation Estimate (inches)	14.95	16.8	19.35	21.36
Peak Inflow Based on 72-hour Precipitation Estimates (cfs)	142,810	162,543	196,492	215,891
Peak Inflow from USGS Gage Station 11109600 Analysis (cfs)	68,800	100,000	146,400	190,000

Note: cfs – cubic feet per second

Source: GEI 2015b

Lower Piru Creek

The hydrology of lower Piru Creek is characterized by controlled releases through the Santa Felicia Dam outlet works system and uncontrolled releases through the spillway channel during spill events. The controlled water releases consist of water releases associated with water management activities (conservation releases) and minimum water releases required under UWCD’s FERC license for the Santa Felicia Hydroelectric Project, as outlined in its Water Release Plan to benefit steelhead habitat and migration; this is described in greater detail in Section 2.4.3, Water Release Requirements Associated with FERC License for the Santa Felicia Hydroelectric Project (UWCD 2012a). The conservation releases are used for water supply and to recharge groundwater basins in the Santa Clara River Valley and the Oxnard Plain. Water is retained and stored in Lake Piru Reservoir during the winter and spring months when downstream groundwater basins are at their fullest level. UWCD generally conducts conservation releases in the fall, when groundwater basins and surface flows in the river are at their lowest levels. These releases typically involve flows between 200 to 500 cfs at a time to maximize the amount of water

that reaches the Freeman Diversion¹ for surface water delivery and groundwater replenishment. The monthly discharge statistics for lower Piru Creek are provided in Table 5.10-4 (USGS 2017c).

Table 5.10-4 Lower Piru Creek (Piru Creek below Lake Piru Reservoir) - Monthly Discharge Statistics After Construction of the Santa Felicia Project – 1974 to 2017 (USGS Gage Station 11109800)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
Mean (cfs)	139	45.3	16.3	12.7	17.9	28.8	25.6	34.8	40.6	46.8	57.9	142.9
Median (cfs)	72	7.8	6.9	5.9	5.8	6.0	6.6	7.2	7.8	7.7	7.7	89
Max. (cfs)	650	441	329	249	422	495	484	400	497	526	404	560
Min. (cfs)	0	2.6	0	0	0	0	0	0	0	0	0	0

Note: cfs – cubic feet per second

Source: USGS 2017c

The Santa Felicia Dam infrastructure and operations of Lake Piru Reservoir were developed for water resource management and not flood control. Therefore, UWCD does not control spill events. Once the water surface elevation in the lake reaches the spillway crest elevation of 1,055 feet msl, water spills into lower Piru Creek. Spills continue until the water surface elevation recedes below the spillway crest elevation, mimicking the natural recession of flows entering the lake. Historically, spill events have occurred in 11 of the 62 years of record between the years 1956 and 2017, approximately once every five to six years on average. The maximum mean daily spill discharge in each spill year over this period ranged from 220 cfs to 8,760 cfs, as summarized in Table 5.10-5.

Table 5.10-5 Maximum Mean Daily Spill Discharge at Santa Felicia Dam – 1956–2017

Date	Maximum Mean Daily Spill Discharge (cfs)
February 23, 1969	7,700
March 5, 1978	4,686
April 3, 1979	506
February 21, 1980	2,000
March 3, 1983	3,048
March 30, 1992	220
February 8, 1993	2,588
February 14, 1995	1,077
February 12, 1998	6,199
February 21, 2005	8,760
April 5, 2006	384

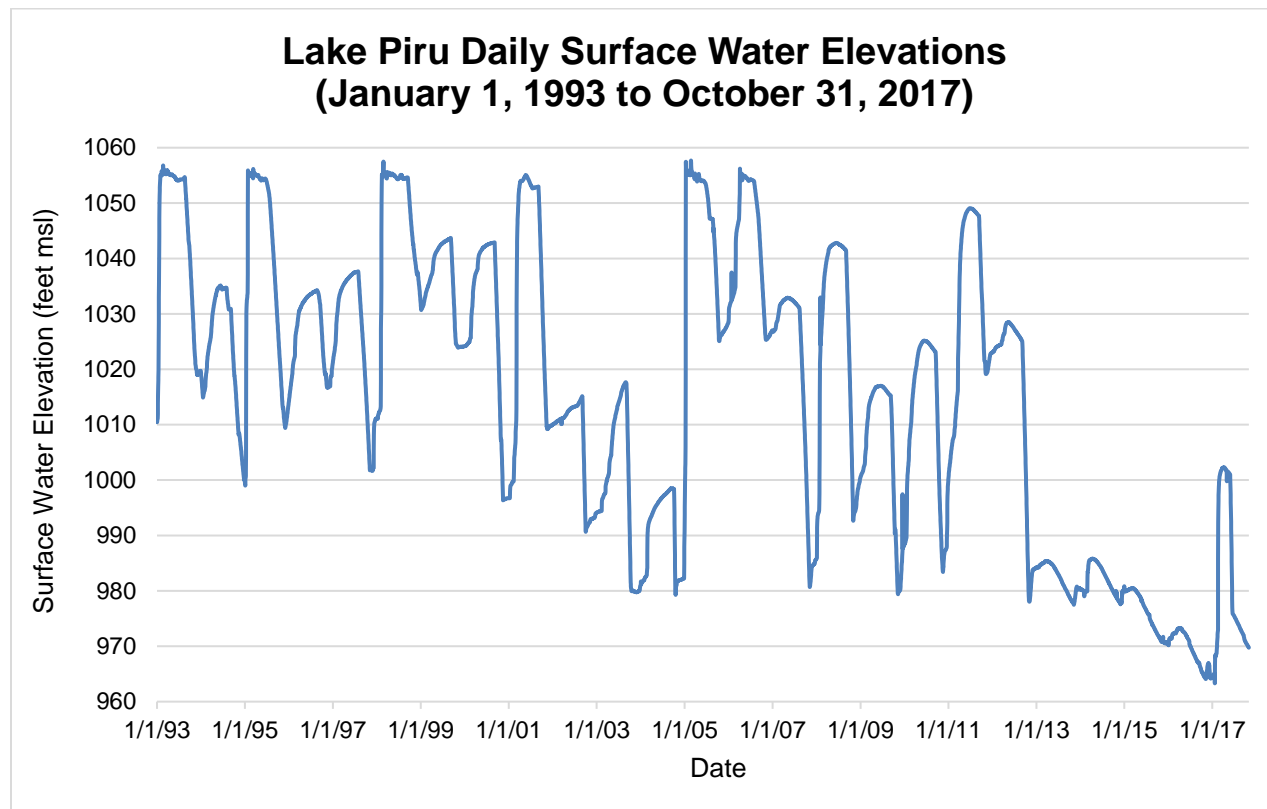
Note: cfs – cubic feet per second

Source: UWCD 2017b

¹ The Freeman Diversion Facility was constructed in 1991 to divert Santa Clara River flow to enhance recharge of local groundwater supplies underground pools that have been breached by seawater. The Freeman Diversion has a maximum diversion capacity of 375 cfs.

5.10.1.3 Surface Water Hydrology of Lake Piru Reservoir

As described above, Lake Piru Reservoir impounds and captures storm flows from middle Piru Creek and water releases from Pyramid Lake for use in recharging downstream groundwater basins. Between January 1993 and October 2017, water surface elevations have ranged from a minimum of 963.30 feet msl to maximum of 1,057.69 feet msl. From a monthly perspective, average water surface elevations have ranged from a low of 999.09 feet msl in November to a high of 1,025.81 feet msl in May. A graph of the daily water surface elevations between January 1993 and October 2017 is provided in Figure 5.10-4 and the monthly statistics over this period are provided in Table 5.10-6.



Source: UWCD 2017a

Figure 5.10-4 Lake Piru Reservoir Daily Surface Water Elevations between January 1, 1993 to October 31, 2017

Table 5.10-6 Lake Piru Reservoir Surface Elevation Data – Monthly Statistics between January 1, 1993 to October 31, 2017

Month	Lake Piru Reservoir Surface Water Elevation Data (feet msl)		
	Minimum	Maximum	Average
January	963.30	1057.45	1006.69
February	968.45	1057.69	1015.03
March	972.31	1056.15	1021.48
April	972.75	1056.23	1024.77
May	971.80	1055.35	1025.81
June	970.08	1054.84	1025.20
July	968.62	1055.10	1024.50
August	967.17	1054.70	1023.17
September	965.62	1054.64	1017.49
October	964.35	1049.70	1004.59
November	964.07	1042.15	999.09
December	964.19	1037.50	1000.02

Source: UWCD 2017a

5.10.1.4 Geomorphology

The Piru Creek watershed (see Figure 5.10-1) is characterized by broad alluvial sub-basins alternating with gorges incised in bedrock, and, in general, the creek flows along structural trends (USGS 1968). The headwaters of the creek are located in Lockwood Valley within the Los Padres National Forest and the upper portion of the watershed consists of rugged, undisturbed terrain. From its headwaters, the creek meanders eastward approximately 30 miles while dropping 2,200 feet in elevation through a series of open valleys and steep gorges before reaching Pyramid Lake. The watershed area contributing to Pyramid Lake is approximately 295 square miles and, the watershed area between Pyramid Lake and Santa Felicia Dam is approximately 128 square miles (GEI 2012b).

The creek continues south below Pyramid Lake for approximately 19 miles through the Los Padres National Forest to Lake Piru Reservoir. The watershed between Pyramid Lake and Lake Piru Reservoir is more mountainous and contains fewer valley flats than the area situated upstream of Pyramid Lake (USGS 1968). Major tributaries to Piru Creek situated below Pyramid Lake include Fish Creek, which is located approximately three miles below Frenchman's Flat, just south of Pyramid Lake, and Agua Blanca Creek, which is located approximately one mile upstream from the Blue Point Campground. The contributing watershed area to Lake Piru Reservoir is approximately 423 square miles (GEI 2015b).

Downstream of Lake Piru Reservoir, the creek continues south for approximately six miles to its confluence with the Santa Clara River and has a watershed area of approximately 15 square miles. The lower portion of Piru Creek consists of a relatively low gradient, broad alluvial valley. Lower Piru Creek has been altered from an intermittent drainage to a perennial drainage by sustained base flows. The flow regime has varied since completion of the Santa Felicia Dam in 1956 as water resource management

strategies have evolved. Major tributaries below Lake Piru Reservoir include Modelo Canyon, Holser Canyon, Lime Canyon, Blanchard Canyon, and five unnamed tributaries.

The sediment supply to lower Piru Creek is limited as both Pyramid Lake and Lake Piru Reservoir trap sediment transported from the upper Piru Creek watershed. Approximately 75 percent of Piru Creek's total watershed area is situated upstream of Santa Felicia Dam. Based on storage capacity surveys, the storage volume in Lake Piru Reservoir has decreased by approximately 19,240 acre-feet between 1957 and 2015. Survey data between 1975 and 2015 indicate that, on average, approximately 224 acre-feet per year of sediment is trapped behind Santa Felicia Dam from the watershed area between Pyramid Lake and Lake Piru Reservoir (GEI 2015a). The watershed area between Pyramid Lake and Lake Piru Reservoir is approximately 141 square miles and based on the Lake Piru Reservoir storage data from 1975 to 2015, the approximate sedimentation rate within this watershed area is approximately 1.6 acre-feet per square mile per year. Since sediment in Lake Piru Reservoir is isolated behind the dam, the sediment supply to lower Piru Creek is limited to contributing sources situated downstream of the dam. Based on the estimated sedimentation rate from the Lake Piru Reservoir storage data and the effective watershed area downstream of the Santa Felicia Dam (i.e., lower Piru Creek, approximately 15 square miles), the estimated sedimentation rate for lower Piru Creek is approximately 24 acre-feet per year.

The primary sources of sediment to lower Piru Creek consist of in-channel sources associated with channel incision and bank erosion, sediment delivered by tributaries and small drainages situated downstream of Santa Felicia Dam, and direct input by surface runoff from developed and undeveloped land in the lower watershed. The most significant source of sediment consists of the tributaries and small drainages situated downstream of Santa Felicia Dam. These tributaries include Modelo Canyon, Holser Canyon, Blanchard Canyon, Lime Canyon, and five unnamed drainages. The drainages are intermittent with surface flows occurring in response to seasonal rainfall events. Accordingly, sediment delivery from these areas is primarily limited to the wet season between November and April of each year. These drainages, as well as the other local drainages, appear to primarily contribute fine silts, sands, and to a lesser degree, small gravels.

5.10.1.5 Groundwater

Eight major groundwater basins are situated within UWCD's service area: Piru, Fillmore, Santa Paula, Mound, Oxnard Forebay, Oxnard Plain, Pleasant Valley, and West Las Posas (see Figure 5.10-5). The groundwater basins within UWCD's service area supply water for agricultural, industrial, and municipal uses.

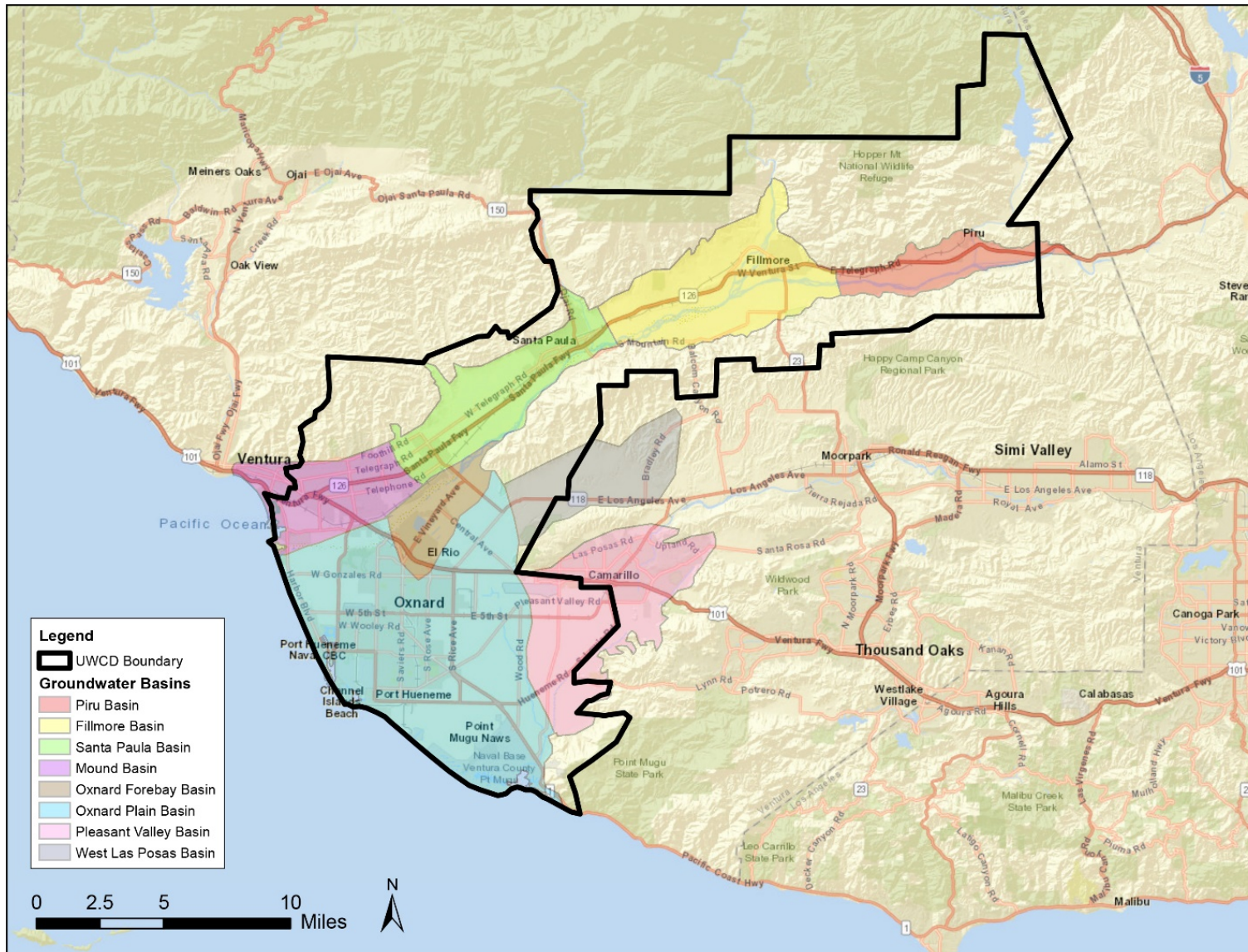
Geologically, these groundwater basins are the result of Tertiary and Quaternary alluvial deposits of sand and gravel deposited by the Santa Clara River and alluvial fans along its tributaries. Two main aquifer systems are present on the costal basins: the Upper Aquifer System, which includes the shallow, Oxnard and Mugu aquifers, and the Lower Aquifer System, which contains the upper Hueneme, lower Hueneme, and Fox Canyon aquifers. These aquifers typically consist of sand and gravel and are separated by less permeable layers of silt and clay (FERC 2007).

The following provides an overview of the groundwater basins within UWCD's service area:

- > Piru – an unconfined aquifer consisting of sand and gravel deposits from Piru Creek and the Santa Clara River with a typical depth of recent alluvium of 60 to 80 feet. Its main sources of recharge are Piru Creek and the Santa Clara River.
- > Fillmore - an unconfined aquifer downstream of the Piru groundwater basin consisting of sand and gravel deposits from Sespe Creek and the Santa Clara River with a typical depth of recent alluvium of 60 to 120 feet. Its main sources of recharge are Sespe Creek, the Santa Clara River, and groundwater flow from the Piru groundwater basin.

- > Santa Paula – an unconfined aquifer in its upper levels and a confined aquifer in its lower levels and in the western portion. The basin is comprised of alluvial sediments from Santa Paula Creek, the Santa Clara River, and other tributaries. Its main sources of recharge are Santa Paula Creek, the Santa Clara River, percolation of precipitation on permeable surficial deposits, and groundwater flow from the Fillmore groundwater basin. Recharge from the Santa Clara River is limited to a two-mile section near the city of Santa Paula due to the presence of relatively impermeable deposits under the current river channel in other areas.
- > Mound – comprised of a clayey upper strata, up to 300 feet thick, that limits most of the surface percolation to aquifer outcrop areas in the northeast sections of this basin. Groundwater flow within this basin is generally east to west with the discharge to the ocean. Limited groundwater inflow likely reaches this basin from the Santa Paula and Oxnard Plain groundwater basins.
- > Oxnard Forebay and Oxnard Plain – Recharge to the Oxnard Forebay is primarily from the Santa Clara River, artificial recharge from UWCD recharge basins, irrigation return flows, percolation of rainfall, and groundwater flow from surrounding groundwater basins. The main recharge source of the Oxnard Plain is groundwater flow from the Oxnard Forebay. Limited surface percolation occurs in the Oxnard Plain due to substantial confining clay layers. Within the Oxnard Plain, the Oxnard aquifer is the main aquifer used to supply the overlying agricultural operations and the cities of Ventura, Port Hueneme, and Oxnard. The Oxnard Plain aquifer is situated approximately 100 to 220 feet below the ground surface and consists of highly permeable sand and gravel.
- > Pleasant Valley – a confined aquifer overlain by clay layers that limit percolation from the surface. Its main source of recharge is groundwater flow from the Oxnard Plain basin.
- > West Las Posas – consists of both confined and unconfined aquifers and is recharged by infiltration of precipitation, minor stream flow across outcrops of the Fox Canyon and Grimes Canyon gravels, and percolation from flow in the Arroyo Las Posas.

The Oxnard Plain basin has been in a critical state of groundwater overdraft for many years (FERC 2007). Once overdraft occurs in hydraulically connected aquifers near the coast, saltwater intrudes into the aquifers and makes the water unusable in portions of the aquifer. The conservation releases from Lake Piru Reservoir are used to recharge the Piru, Fillmore, Santa Paula, Mound and Oxnard Forebay basins and combat saltwater intrusion in the coastal aquifers. In addition, the Freeman Diversion, a permanent concrete structure that was constructed on the Santa Clara River near Santa Paula in 1991, is used to divert both conservation releases and natural runoff to recharge ponds and other water supply pipelines. Table 5.10-7 shows the characteristics of the recharge basins associated with the Freeman Diversion and a much smaller diversion along Piru Creek which is located on lower Piru Creek near the town of Piru.



Source: UWCD 2017c

Figure 5.10-5 Groundwater Basins within United Water Conservation District Service Area

Table 5.10-7 Groundwater Recharge Facility Characteristics

	Piru Diversion and Spreading Grounds	Freeman Diversion and Saticoy Recharge Facility*	El Rio Recharge Facility
Maximum Diversion Rate (cfs)	75	375	120 (pipeline from Saticoy)
Number of Basins	9	19	10
Wetted Area (acres)	44	345	81
Percolation Capacity (acre-feet per day)	150	450	240
Average Annual Diversion (acre-feet)	6,610	70,100 (since 1991)	n/a
Average Annual Spreading (acre-feet)	6,610	27,250	23,300

* Includes the Saticoy, Noble, Rose, and Ferro recharge basins.

Source: UWCD 2017d

cfs = cubic feet per second

5.10.1.6 Water Quality

Water quality data collected in middle Piru Creek (upstream of Lake Piru Reservoir) near the Blue Point Campground, between February 2011 and November 2015 indicates electrical conductivity (EC) values ranging between 608 and 1,300 μ mhos/cm, total dissolved solids (TDS) concentrations ranging from 370 to 942 mg/l, and pH values ranging from 7.1 to 9.1. During that same period, sulfate concentrations ranged from 83.1 to 791 mg/l, chloride concentrations ranged from 35.7 to 135 mg/l, and nitrate concentrations ranged from less than the detection limit of 0.5 mg/l to 1.8 mg/l. The EC, TDS, and pH data are summarized in Table 5.10-10 and the sulfate, chloride, and nitrate data are summarized in Table 5.10-11 (UWCD 2017e).

In Lake Piru Reservoir, water quality data collected near the marina docks between February 2011 and November 2015 indicates EC values ranging between 694 and 1,300 μ mhos/cm, TDS concentrations ranging from 430 to 965 mg/l, and pH values ranging from 7.9 to 9.0. During that same period, sulfate concentrations ranged from 159 to 640 mg/l, chloride concentrations ranged from 44 to 97.1 mg/l, and nitrate concentrations ranged from less than the detection limit of 0.5 mg/l to 1.1 mg/l. The EC, TDS, and pH data are summarized in Table 5.10-10 and the sulfate, chloride, and nitrate data are summarized in Table 5.10-11 (UWCD 2017e). A summary of measured monthly water quality data collected in 2017 in respect to the vertical profile in Lake Piru Reservoir is provided below (see Table 5.10-8):

- > Between January and March 2017, the measured surface water temperatures ranged between 10.8 and 13.3 °C and the measured bottom temperatures ranged between 10.5 and 11.8 °C. Surface dissolved oxygen (DO) concentrations ranged between 8.74 and 13.13 mg/l, and measured DO at the bottom ranged between 7.36 and 9.37 mg/l. Measured pH values ranged between 7.62 and 8.5 at the water surface and between 7.45 and 7.85 at the bottom (UWCD 2017f).
- > Between April and June 2017, the measured surface water temperatures ranged between 18.5 and 22.4 °C and the measured bottom temperatures ranged between 12.8 and 21.1 °C. Surface DO concentrations ranged between 8.36 and 8.57 mg/l and measured DO at the bottom ranged between

3.4 and 5.75 mg/l. Measured pH values ranged between 8.03 and 8.3 at the water surface and between 7.27 and 8.03 at the bottom (UWCD 2017f).

- > Between July and September 2017, the measured surface water temperatures ranged between 24.3 and 26.6 °C and the measured bottom temperatures ranged between 23 and 24 °C. Surface DO concentrations ranged between 7.29 and 8.2 mg/l and measured DO at the bottom ranged between 0.09 and 1.08 mg/l. Measured pH values ranged between 7.93 and 8.62 at the water surface and between 7.16 and 7.87 at the bottom (UWCD 2017f).
- > Between October and December 2017, the measured surface water temperatures ranged between 15.5 and 19.5 °C and the measured bottom temperatures ranged between 14.8 and 18.7 °C. Surface DO concentrations ranged between 8.65 and 9.13 mg/l and measured DO at the bottom ranged between 7.14 and 8.38 mg/l. Measured pH values ranged between 8.75 and 8.76 at the water surface and between 8.66 and 8.71 at the bottom (UWCD 2017f).

The water quality composition of releases from Lake Piru Reservoir is equivalent to that of the lake, at the elevation of the outlet works. Water quality data collected in lower Piru Creek near Santa Felicia Dam between February 2011 and November 2015 indicate EC values ranging between 676 and 1,310 µmhos/cm, TDS concentrations ranging from 470 to 968 mg/l, and pH values ranging from 8.2 to 9.2. During that same period, sulfate concentrations ranged from 170 to 482 mg/l, chloride concentrations ranged from 44.1 to 98 mg/l, and nitrate concentrations ranged from less than the detection limit of 0.5 mg/l to 1.8 mg/l. The EC, TDS, and pH data are summarized in Table 5.10-10 and the sulfate, chloride, and nitrate data are summarized in Table 5.10-9 (UWCD 2017e).

In March 2014, the SWRCB issued a water quality certification (certification) pursuant to section 401 of the Clean Water Act for the Operational Changes at the Santa Felicia Project associated with the FERC license amendment for the Water Release Plan (UWCD 2012a). Condition 2 of the certification required UWCD to develop and implement a Dissolved Oxygen Monitoring Plan (DOMP) to determine if flows released from the Santa Felicia Project are in compliance with Water Quality Control Plan for the Los Angeles Region – Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (Basin Plan) DO water quality objectives. In accordance with this requirement, UWCD developed a DOMP (UWCD 2015c) and has conducted DO monitoring at two locations in middle Piru Creek upstream of Lake Piru Reservoir to assess influent DO levels to the lake, and two locations in lower Piru Creek between Santa Felicia Dam and the UWCD-Rancho Temescal property line. The results of the monitoring indicate that DO levels in lower Piru Creek periodically fall below the water quality objectives outlined in the Basin Plan. Accordingly, UWCD is consulting with SWRCB on developing measures to address the issue.

Near the town of Piru, water quality data collected in lower Piru Creek between February 2011 and November 2015 indicate EC values ranging between 717 and 1,510 µmhos/cm, TDS concentrations ranging from 506 to 1,330 mg/l, and pH values ranging from 8.0 to 9.0. During that same period, sulfate concentrations ranged from 180 to 680 mg/l, chloride concentrations ranged from 46.7 to 105 mg/l, and nitrate concentrations ranged from less than the detection limit of 0.5 mg/l to 10 mg/l. The EC, TDS, and pH data are summarized in Table 5.10-8 and the sulfate, chloride, and nitrate data are summarized in Table 5.10-9 (UWCD 2017e).

Table 5.10-8 Measurements of Electrical Conductivity, Total Dissolved Solids, and pH in Middle Piru Creek, Lake Piru Reservoir, and Lower Piru Creek

Date	Middle Piru Creek at Blue Point Campground			Lake Piru Reservoir at Marina Docks			Piru Creek below Santa Felicia Dam			Piru Creek near Town of Piru		
	Electrical Conductivity (µmhos/cm)	Total Dissolved Solids (mg/l)	pH	Electrical Conductivity (µmhos/cm)	Total Dissolved Solids (mg/l)	pH	Electrical Conductivity (µmhos/cm)	Total Dissolved Solids (mg/l)	pH	Electrical Conductivity (µmhos/cm)	Total Dissolved Solids (mg/l)	pH
2/10/2011	727	430	--	846	520	--	832	530	--	1,550	1,090	--
4/22/2011	608	370	--	694	430	--	779	470	--	1,760	1,330	--
8/4/2011	792	500	--	752	480	--	799	490	--	1,140	770	--
10/20/2011	789	589	8.2	675	503	8.5	676	492	8.2	717	506	8.6
1/19/2012	609	377	8.7	797	504	8.5	809	510	8.9	1,289	929	8.7
4/23/2012	644	370	9.1	809	510	8.8	817	507	9	1,340	926	8.8
7/24/2012	1,060	784	8.6	799	522	9	757	522	9.1	1,200	780	8.7
11/8/2012	658	380	9.1	884	592	8.9	925	601	9.2	1,220	815	8.7
2/7/2013	883	586	7.9	917	624	8.3	951	635	8.8	1,190	845	8.5
5/8/2013	930	576	8.8	1,060	691	8.7	1,020	702	8.7	1,280	915	8.4
7/23/2013	--	--	--	1,020	733	9	1,020	761	8.8	1,290	943	8.5
11/7/2013	1,200	751	8.8	1,120	781	9	1,100	800	8.6	1,440	1,050	8.8
2/4/2014	868	569	7.8	1,060	757	8.2	1,090	776	8.2	1,410	1,060	7.8
4/23/2014	964	585	9	1,060	745	8.6	1,090	731	8.8	1,470	1,040	8.3
7/24/2014	1,210	814	8.2	1,130	763	9	1,150	777	9.2	1,450	1,010	9
11/18/2014	1,200	804	8.2	1,190	813	8.4	1,190	819	8.6	1,470	1,080	8.4
1/22/2015	1,010	676	--	1,140	829	--	1,150	828	--	1,320	959	--
4/20/2015	1,150	744	7.1	1,230	869	7.9	1,190	842	8.2	1,380	1,080	8
7/21/2015	1,300	942	7.7	1,240	907	8.4	1,250	908	8.3	1,510	1,190	8
11/9/2015	880	543	8.3	1,300	965	7.9	1,310	968	8.2	1,460	1,080	8.2

"--" indicates water quality data not available.

Source: UWCD 2017e

Table 5.10-9 Measurements of Sulfate, Chloride, and Nitrate in Middle Piru Creek, Lake Piru Reservoir, and Lower Piru Creek

Date	Middle Piru Creek at Blue Point Campground			Lake Piru Reservoir at Marina Docks			Piru Creek below Santa Felicia Dam			Piru Creek near Town of Piru		
	Sulfate (mg/l)	Chloride (mg/l)	Nitrate (mg/l)	Sulfate (mg/l)	Chloride (mg/l)	Nitrate (mg/l)	Sulfate (mg/l)	Chloride (mg/l)	Nitrate (mg/l)	Sulfate (mg/l)	Chloride (mg/l)	Nitrate (mg/l)
2/10/2011	142	57	<0.4	204	57	1	207	59	1.2	580	70	1.7
4/22/2011	127	44	1.8	159	45	1.1	196	51	1.3	680	60	10
8/4/2011	181	42	<0.4	173	47	<0.4	186	49	1.8	360	60	0.8
10/20/2011	210	43.9	<0.5	180	44	<0.5	170	47.2	1.13	180	46.7	1.1
1/19/2012	110	35.7	<0.5	180	44.2	<0.5	180	44.1	<0.5	410	53.5	0.71
4/23/2012	114	52.1	<0.5	200	50.2	<0.5	204	53.4	<0.5	384	50.8	0.81
7/24/2012	791	43.1	<0.5	191	46.6	<0.5	182	44.6	0.97	320	51.8	0.59
11/8/2012	83.9	87.2	<0.5	243	49.3	<0.5	239	48.8	<0.5	369	57.9	0.61
2/7/2013	195	69.3	<0.5	240	57.1	<0.5	379	62.3	0.68	242	56.1	<0.5
5/8/2013	180	87.5	<0.5	290	62.8	<0.5	281	61.8	<0.5	411	66.8	<0.5
7/23/2013	--	--	--	299	61.4	<0.5	295	63.3	<0.5	434	68.6	0.58
11/7/2013	202	135	<0.5	344	60.5	<0.5	348	61.4	<0.5	522	69.4	0.53
2/4/2014	150	97.6	<0.5	346	73.7	<0.5	349	72.7	<0.5	511	89.3	0.86
4/23/2014	178	84.2	<0.5	301	67.5	0.64	301	67.4	1.2	460	84.6	0.56
7/24/2014	242	84.8	<0.5	314	66.6	<0.5	305	65.3	0.7	430	71.4	0.96
11/18/2014	223	104	<0.5	318	77.3	<0.5	315	76.4	<0.5	432	84.1	0.66
1/22/2015	187	79.1	<0.5	325	75.3	<0.5	328	81.8	<0.5	394	84	<0.5
4/20/2015	211	95.6	<0.5	323	81.8	<0.5	320	80.9	0.54	453	90.3	0.53
7/21/2015	305	101	<0.5	640	79.1	<0.5	379	79.6	<0.5	507	86.2	0.59
11/9/2015	134	115	0.97	478	97.1	<0.5	482	98	0.62	572	105	0.56

"--" indicates water quality data not available.

Source: UWCD 2017e

Table 5.10-10 Monthly Lake Piru Reservoir Vertical Water Quality Profile Data – January to December 2017

Depth (feet below water surface)	January			February			March			April			May			June			July			August			September			October			November			December				
	Temp (°C)	DO (mg/l)	pH	Temp (°C)	DO (mg/l)	pH	Temp (°C)	DO (mg/l)	pH	Temp (°C)	DO (mg/l)	pH	Temp (°C)	DO (mg/l)	pH	Temp (°C)	DO (mg/l)	pH	Temp (°C)	DO (mg/l)	pH	Temp (°C)	DO (mg/l)	pH	Temp (°C)	DO (mg/l)	pH	Temp (°C)	DO (mg/l)	pH	Temp (°C)	DO (mg/l)	pH					
0	10.8	10.17	7.93	13.3	13.13	8.5	12.9	8.74	7.62	18.5	8.4	8.03	19.6	8.57	8.08	22.4	8.36	8.3	25.3	7.66	8.62	24.3	7.29	8.51	26.6	8.2	7.93	19.5	8.65	NA	17.4	9.13	8.75	15.5	8.97	8.76		
2	10.8	10.15	7.93	12.9	12.38	8.4	12.9	8.67	7.61	18.4	8.36	8.02	19.6	8.56	8.1	22.6	8.25	8.35	25.3	7.66	8.64	25.3	7.3	8.51	26.6	8.19	7.96	--	--	--	17.4	9.1	8.74	--	--	--		
4	10.7	10.13	7.92	12.8	12.04	8.37	12.8	8.64	7.6	18.2	8.4	8.02	19.6	8.55	8.11	22.2	8.1	8.36	25.3	7.69	8.64	25.3	7.3	8.51	26.6	8.19	7.98	19.2	8.26	NA	17.3	9.05	8.74	15.1	8.74	8.74		
6	10.7	10.11	7.92	12.8	11.84	8.33	12.8	8.66	7.61	18	8.47	8.03	19.6	8.54	8.11	--	--	--	25.3	7.61	8.64	25.2	7.25	8.5	26.6	8.17	8.01	--	--	--	17.2	8.88	8.72	--	--	--		
8	10.7	10.11	7.92	12.8	11.85	8.33	12.8	8.62	7.6	17.9	8.49	8.04	19.6	8.53	8.1	21.9	7.82	8.34	25.3	7.52	8.63	25.2	7.09	8.48	26.5	8.07	8.01	18.8	7.4	NA	17.1	8.77	8.72	15	8.49	8.72		
10	10.7	10.03	7.92	12.8	11.82	8.33	12.8	8.61	7.6	--	--	--	19.5	8.52	8.1	--	--	--	25.2	7.43	8.61	25.2	6.88	8.46	26	7.48	7.95	--	--	--	17	8.62	8.71	--	--	--		
12	10.7	10.02	7.92	12.8	11.51	8.31	12.8	8.58	7.6	17.8	8.46	8.03	19.5	8.49	8.1	21.8	7.62	8.33	25.1	6.92	8.58	25.1	6.83	8.46	26	7.35	7.93	18.8	7.45	NA	16.9	8.38	8.69	15	8.47	8.72		
14	10.7	9.97	7.92	12.7	11.12	8.23	12.8	8.6	7.59	--	--	--	19.4	8.46	8.09	--	--	--	25.2	7.17	8.6	25.1	6.75	8.45	25.9	7.13	7.91	--	--	--	16.8	8.25	8.69	--	--	--		
16	10.6	9.89	7.91	12.1	10.21	8.07	12.7	8.55	7.59	17.7	8.34	8.01	19.3	8.46	8.09	21.2	7.58	8.32	25.2	7.15	8.6	25.1	6.68	8.44	25.7	6.83	7.87	18.8	7.44	NA	16.8	8.2	8.68	15	8.47	8.72		
18	10.6	9.86	7.9	11.9	9.96	7.98	12.7	8.52	7.58	--	--	--	19.3	8.39	8.08	--	--	--	25.2	7.02	8.59	25.1	6.55	8.43	25.4	5.44	7.71	--	--	--	16.7	8.16	8.68	--	--	--		
20	10.6	9.82	7.9	11.7	9.79	7.96	12.6	8.27	7.55	17.2	8.08	7.98	19.2	8.38	8.08	21.6	7.51	8.31	25.2	6.78	8.59	25.1	6.44	8.42	25	4.49	7.59	18.8	7.44	NA	16.7	8.08	8.68	14.9	8.47	8.72		
22	10.6	9.8	7.9	11.3	9.64	7.9	12.2	8.47	7.57	--	--	--	19.2	8.42	8.08	--	--	--	25	6.41	8.5	25	6.22	8.4	24.9	4.15	7.53	--	--	--	16.7	8.09	8.68	--	--	--		
24	10.6	9.73	7.89	11.1	9.55	7.89	12.1	8.5	7.58	16.8	7.94	7.94	19.1	8.38	8.08	21.5	7.28	8.3	24.9	5.93	8.46	25	6.13	8.38	24.7	3.46	7.43	18.7	7.38	NA	16.6	8.07	8.68	14.9	8.47	8.72		
26	10.6	9.55	7.87	11	9.43	7.87	12.1	8.15	7.54	--	--	--	19	8.34	8.07	--	--	--	24.5	5.03	8.36	25	6.25	8.39	24.6	3.01	7.38	--	--	--	16.6	8.02	8.68	--	--	--		
28	10.6	9.46	7.86	10.9	9.14	7.82	12	7.9	7.51	16.3	7.88	7.8	18.3	7	7.85	21.4	7.16	8.27	24.5	4.92	8.35	25	6.62	8.42	24.5	2.84	7.34	18.7	7.45	NA	16.6	7.94	8.68	14.9	8.46	8.72		
30	10.6	9.4	7.85	10.6	8.94	7.79	12.1	7.99	7.5	--	--	--	18.2	6.55	7.76	--	--	--	24.4	4.8	8.32	24.8	4	8.15	24.4	2.77	7.32	--	--	--	16.6	7.91	8.68	--	--	--		
32	10.6	9.39	7.85	10.6	8.92	7.78	12	7.84	7.49	15.6	6.65	7.71	17.6	5.29	7.63	21.3	6.98	8.26	24.4	4.69	8.32	24.7	3.12	8.04	24.3	2.26	7.26	18.7	7.28	NA	16.6	7.85	8.67	14.9	8.46	8.72		
34	10.6	9.37	7.85	10.6	8.92	7.78	12	7.77	7.48	--	--	--	17.4	4.99	7.56	--	--	--	24.3	4.49	8.27	24.6	2.84	8.01	24.2	2.26	7.26	--	--	--	16.6	7.76	8.67	--	--	--		
36	--	--	--	10.5	8.87	7.77	11.9	7.74	7.48	14.7	5.73	7.66	17.2	4.81	7.49	21.2	6.48	8.22	24.2	3.86	8.21	24.5	2.23	7.94	24.2	2.09	7.24	18.7	7.14	NA	16.6	7.59	8.66	14.9	8.47	8.72		
38	--	--	--	10.5	8.7	7.75	11.9	7.71	7.48	--	--	--	16.8	4.51	7.44	21.2	6.33	8.17	23	1.73	7.92	24.1	1.09	7.8	24.1	1.62	7.19	--	--	--	--	--	--	14.8	8.38	8.71		
40	--	--	--	--	--	--	11.9	7.7	7.47	14	5.33	7.57	16.7	4.51	7.41	20.9	5.65	8.09	23	0.47	7.87	23.4	0.09	7.69	24	1.08	7.16	--	--	--	--	--	--	--	--	--		
42	--	--	--	--	--	--	11.9	7.67	7.47	--	--	--	16.5	4.29	7.4	20.9	5.54	8.07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
44	--	--	--	--	--	--	11.8	7.51	7.42	13.5	5	7.51	15.9	4.07	7.37	21.1	5.75	8.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
46	--	--	--	--	--	--	11.8	7.5	7.46	--	--	--	15.5	3.9	7.36	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
48	--	--	--	--	--	--	11.8	7.49	7.46	13.2	4.91	7.47	14.7	3.54	7.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
50	--	--	--	--	--	--	11.8	7.46	7.46	--	--	--	14.5	3.43	7.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
52	--	--	--	--	--	--	11.8	7.41	7.46	13	4.91	7.45	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
54	--	--	--	--	--	--	11.8	7.37	7.45	--	--	--	14	3.4	7.27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
56	--	--	--	--	--	--	11.8	7.36	7.45	12.8	4.84	7.43	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
58	--	--	--	--	--	--	11.8	7.32	7.44	--	--	--	13.5	2.52	7.21	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
60	--	--	--	--	--	--	11.8	7.35	7.45	12.6	4.45	7.41	13.1	2.15	7.17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
62	--	--	--	--	--	--	11.8	7.36	7.45	--	--	--	13.1	2.04	7.15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
64	--	--	--	--	--	--	11.8	7.37	7.45	12.6	4.21	7.39	13	1.94	7.13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
66	--	--	--	--	--	--	--	--	--	--	--	--	13	1.91	7.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
68	--	--	--	--	--	--	--	--	--	12.6	4.14	7.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

"--" indicates water quality data not measured.

Source: UWCD 2017f

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5.10.2 Regulatory Framework

Hydrology and water quality issues for the Project are governed by an extensive framework of regulations at the federal, state, and local levels. The primary agencies with regulatory authority of the Project include the USEPA, USACE, FERC, Federal Emergency Management Agency (FEMA), SWRCB, and the LARWQCB.

5.10.2.1 *Federal*

5.10.2.1.1 Clean Water Act

The USEPA regulates water quality under the CWA. The CWA, enacted by the federal government in 1972, was designed to restore and maintain the chemical, physical, and biological integrity of waters in the United States. The CWA provides the legal framework for several water quality regulations including NPDES permits, effluent limitations, water quality standards, pretreatment standards, Antidegradation Policy, nonpoint source discharge regulation, and wetlands protection. The USEPA has delegated the responsibility for administration of portions of the CWA to state and regional agencies; therefore, the primary regulations resulting from the CWA are discussed in the state and local regulation descriptions that follow.

The federal Antidegradation Policy (40 CFR Section 131.12) requires states to develop statewide antidegradation policies and identify methods for implementing them. Pursuant to the CFR, state antidegradation policies and implementation methods shall, at a minimum, protect and maintain: (1) existing in-stream water uses; (2) existing water quality where the quality of the waters exceeds levels necessary to support existing beneficial uses, unless the state finds that allowing lower water quality is necessary to accommodate economic and social development in the area; and (3) water quality in waters considered an outstanding national resource. State permitting actions must be consistent with the federal Antidegradation Policy.

Section 401

Under Section 401 of the CWA, any person applying for a federal permit or license, which may discharge pollutants into waters of the United States, must obtain a State Water Quality Certification. This certification is required to ensure the activity complies with all applicable water quality standards, limitations, and restrictions. No license or permit may be issued by a federal agency until after Section 401 certification has been granted, and no license or permit may be issued if certification has been denied. Examples of permits or licenses that are subject to Section 401 of the CWA include: permits issued under Section 404 of the CWA, permits issued under Sections 9 and 10 of the Rivers and Harbors Act, and licenses for hydroelectric power plants issued by FERC under the Federal Power Act (State Water Resources Control Board 2011a). The LARWQCB administers Section 401 certification and wetlands requirements of the CWA for the Project area.

As part of this Project, UWCD would obtain a CWA Section 404 permit from the USACE Los Angeles District, Regulatory Division for the realignment of the outlet works discharge to lower Piru Creek downstream of Lake Piru Reservoir and would obtain Section 401 Water Quality Certification from the LARWQCB.

Section 404

Under the Section 404 regulatory program of the CWA, no discharge of dredged or fill material into waters of the United States can be permitted if a practicable alternative is less damaging to the aquatic environment or if the waters of the nation would be significantly degraded. The USACE is authorized to issue permits regulating the discharge of dredged or fill material into the waters of the United States, including wetlands. After reviewing permits issued by the USACE, the USEPA can veto a USACE decision to issue a permit. Also, the USEPA develops regulations with which the USACE must comply for

USACE projects. The USACE does not issue itself a permit but is required to ensure that the project complies with guidelines that the USEPA develops in accordance with Section 404(b)(1) of the CWA. As stated above, UWCD would obtain a CWA Section 404 permit from the USACE Los Angeles District, Regulatory Division, for the realignment of the outlet works discharge to lower Piru Creek downstream of Lake Piru Reservoir. A formal jurisdictional delineation will be conducted and submitted to the USACE as part of the Project documentation.

Section 402

As authorized by Section 402 of the CWA, the NPDES permit program regulates point sources that discharge pollutants into waters of the United States. Dischargers whose projects disturb one or more acres of soil are required to obtain coverage under the General Permit for Discharges of Stormwater Associated with Construction Activity, also called the Construction General Permit. The Construction General Permit requires the development and implementation of a stormwater pollution prevention plan (SWPPP), which must identify BMPs that the discharger will use to prevent adverse water quality impacts to receiving water bodies from stormwater runoff. Depending on the site's sediment risk and receiving water risk during periods of soil exposure, turbidity and pH sampling may be required for any stormwater discharge leaving the site. Additionally, the SWPPP must contain a visual monitoring program, a chemical monitoring program, and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment. Piru Creek is not listed on the 303(d) list for sediment (LARWQCB 2012). The LARWQCB administers NPDES permits required by the CWA.

UWCD will be required to obtain coverage under the NPDES General Construction Permit in order to construct the Project and, as part of the permit process, will prepare a SWPPP for the Project.

Section 303(d)

CWA Section 303(d) requires that states develop a list of water quality limited segments that do not meet water quality standards. A total maximum daily load (TMDL) is then established for water quality limited segments in order to improve water quality. A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards.

In the Final 2012 CWA Sections 305(b) and 303(d) Integrated Report for the Los Angeles Region (LARWQCB 2012), Piru Creek, from the gaging station below Santa Felicia Dam to its headwaters, was identified as being impaired for chloride and pH. In addition, Piru Creek, from its confluence with the Santa Clara River to the gaging station below Santa Felicia Dam (identified as Santa Clara River Reach 11 in LARWQCB 2012), is listed as being impaired for sulfates, TDS, boron, and specific conductance (LARWQCB 2012).

5.10.2.1.2 Federal Energy Regulatory Commission

Pursuant to sections 4(e) and 15 of the Federal Power Act, FERC issued a license for operation of the Santa Felicia Hydroelectric Project, dated September 12, 2008. The license specifies various conditions for operation and maintenance of the Project to ensure public safety and comply with environmental regulations. The license includes Reasonable and Prudent Alternative 2, contained in article 401(a) of the license, which required the preparation of the Santa Felicia Water Release Plan (UWCD 2012a). This plan is intended to provide sufficient flows to provide year-round habitat for southern California steelhead in lower Piru Creek and, when certain conditions are met, provide unimpeded migration of adult and juvenile steelhead between lower Piru Creek downstream of Santa Felicia Dam and the Freeman Diversion on the Santa Clara River.

In cooperation with DSOD, FERC is also responsible for overseeing the safety and integrity of Santa Felicia Dam with respect to flooding and geologic/seismic hazards. As part of the process, FERC requires an independent BOC to review the design, plans, and specifications for proposed dam modifications. In this regard, FERC is coordinating with DSOD and the BOC to ensure that the Project complies with

applicable design standards and can safely withstand design seismic conditions and convey design flood flows.

5.10.2.1.3 National Flood Insurance Act

The U.S. Congress established the National Flood Insurance Program (NFIP) with the passage of the National Flood Insurance Act of 1968. The NFIP is a federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses in exchange for state and community floodplain management regulations that reduce future flood damages. Participation in the NFIP is based on an agreement between communities and the federal government. If a community adopts and enforces a floodplain management ordinance to reduce future flood risk to new construction in floodplains, the federal government will make flood insurance available in the community as a financial protection against flood losses. This insurance is designed to provide an alternative to disaster assistance to reduce the escalating costs of repairing damage to buildings and their contents caused by floods. Flood Insurance Rate Maps (FIRMs) are developed by FEMA to determine if a particular parcel lies in a designated 100-year flood zone. FEMA considers Santa Felicia Dam in the development of FIRMs for the downstream area. According to FIRM Panel 0660 (Map No. 06111C0660F), the Santa Felicia Dam spillway is located in an area designated as Zone A/AE (areas subject to inundation by the one percent annual chance flood event). Areas downstream of the dam immediately adjacent to lower Piru Creek are also designated as Zone A/AE.

The objective of the spillway modification component of the Project is to increase the design capacity of the spillway to convey the revised IDF in order to meet current regulatory requirements. The IDF has the probability of occurring approximately 0.05 percent in any given year (approximately once every 2,000 years) and consists of a flow that is much higher than the 100-year FEMA flood flow (i.e., the IDF is 220,000 cfs and the 100-year flood flow ranges between 68,000 cfs and 142,810 cfs). Thus, the Project is not anticipated to influence the current FEMA FIRM.

5.10.2.1.4 California Toxics Rule

The USEPA has established water quality criteria for certain toxic substances via the California Toxics Rule (CTR). The CTR establishes acute and chronic surface water quality standards for bodies of water, such as inland surface waters and enclosed bays and estuaries that are designated by the local Regional Water Quality Control Board as having beneficial uses protective of aquatic life or human health (USEPA 2000). These water quality criteria are applicable to Lake Piru Reservoir and Piru Creek. Accordingly, the Project must comply with the water quality criteria specified in the CTR.

5.10.2.2 State

5.10.2.2.1 Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (embodied in the California Water Code) establishes the principal California legal and regulatory framework for water quality control. Section 13050 of the California Water Code defines what is considered pollution, contamination, or nuisance. Briefly defined, pollution means an alteration of the water quality such that it unreasonably affects the beneficial uses of the water. Contamination means an impairment of the water quality to the degree that it creates a hazard to the public health. Nuisance is defined as anything that is injurious to health, is offensive to the senses, or is an obstruction to property use, and which affects a considerable number of people. Under the Porter-Cologne Water Quality Control Act, the RWQCB issues Waste Discharge Requirements for discharges into state waters, not subject to NPDES or CWA Section 404 permitting.

During construction, the Project activities would be addressed through the permit conditions outlined in the NPDES General Construction Permit and the CWA Section 401/404 Permit. Since the Project does not include discharge of materials into state waters following construction, it is not subject to permitting under this state law.

5.10.2.2.2 California Fish and Game Code Section 1602 (Streambed Alteration Agreement)

Section 1602 of the CFGC (Streambed Alteration Agreement) protects the natural flow, bed, channel, and bank of any river, stream, or lake designated by CDFW in which there is, at any time, any existing fish or wildlife resources, or benefit for the resources. Section 1602 requires an agreement between the CDFW and a public agency proposing a project that would:

- > Divert, obstruct, or change a streambed
- > Use material from the streambed, and/or
- > Result in the disposal, or deposition of debris, waste, or other material containing crumbed, flaked, or ground pavement where it can flow into a stream

As part of this Project, UWCD would obtain a Streambed Alteration Agreement in accordance with Section 1602 of the CFGC for the realignment of the outlet works discharge channel to lower Piru Creek downstream of Lake Piru Reservoir.

5.10.2.2.3 Basin Plan

As required by the CWC, the LARWQCB adopts and periodically updates a plan entitled "Water Quality Control Plan, Los Angeles Region: Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties" (Basin Plan). The Basin Plan designates beneficial uses for bodies of water, sets numerical (quantitative) and narrative (qualitative) water quality objectives applicable to inland surface waters, enclosed bays and estuaries, and includes implementation provisions, programs, and policies to protect all waters covered by the Basin Plan.

Beneficial uses for the Piru Creek watershed are identified in the *Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties* (LARWQCB 2011). The existing beneficial uses identified for Piru Creek and Lake Piru Reservoir include:

- > Municipal and domestic supply
- > Agricultural supply
- > Industrial process supply
- > Industrial service supply
- > Freshwater replenishment
- > Groundwater recharge
- > Hydrogeneration power
- > Water contact recreation
- > Non-contact water recreation
- > Warm freshwater habitat
- > Cold freshwater habitat (except Reach 4B)
- > Wildlife habitat
- > Migration of aquatic organisms (except Lake Piru Reservoir)
- > Rare, threatened, or endangered species
- > Spawning, reproduction, and/or early development (except Reach 4B)

The Project must not result in impacts that violate the water quality objectives outlined in the Basin Plan. Selected water quality objectives for Piru Creek in the Basin Plan are provided in Table 5.10-11.

Table 5.10-11 Selected Water Quality Objectives for Piru Creek

Parameter	Objective
Temperature	The natural receiving water temperature of all regional waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. Alterations that are allowed must not increase water temperatures of waters designated as COLD or WARM more than 5°F above the natural temperature, and the temperature of WARM designated waters shall not be raised above 80°F as a result of waste discharges.
Turbidity	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in natural turbidity attributed to controllable water quality factors shall not exceed the following limits: where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20%; where natural turbidity is greater than 50 NTU, increases shall not exceed 10%.
Dissolved Oxygen	The mean annual DO concentration of all waters shall be greater than 7 mg/L, and no single determination shall be less than 5.0 mg/L, except when natural conditions cause lesser concentrations. The DO content of all surface waters designated as both cold and spawning, reproduction, and/or early development (SPWN) shall not be depressed below 7 mg/L as a result of waste discharges.
pH	The pH of inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges, and ambient pH levels shall not be changed more than 0.5 units from natural conditions as a result of waste discharge.
Total Dissolved Solids	800 mg/L
Sulfate	400 mg/L
Chloride	60 mg/L
Boron	1.0 mg/L
Nitrogen (nitrate plus nitrite)	5 mg/L

Source: LARWQCB 2013

Notes: mg/L = milligrams per liter, NTU = Nephelometric Turbidity Unit

5.10.2.2.4 State Antidegradation Policy

In accordance with the federal Antidegradation Policy discussed previously, the SWRCB adopted Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality Waters in California (more commonly referred to as the state Antidegradation Policy), which restricts the degradation of surface waters of the state and protects bodies of water where the existing water quality is higher than necessary for the protection of present and anticipated designated beneficial uses. The state Antidegradation Policy is implemented by the local Regional Water Quality Control Board.

5.10.2.3 Local**5.10.2.3.1 Ventura County Watershed Protection District**

Although Santa Felicia Dam is located within unincorporated Ventura County, it is exempt from County permit requirements because it is a State water storage and power generation facility, regulated by a license issued by FERC under the Federal Powers Act. Therefore, the Project is not subject to the provisions of the Ventura County General Plan or the Ventura County Watershed Protection District (VCWPD). However, the relevant goals and policies related to hydrology and flooding associated with the VCWPD are provided for informational purposes.

The VCWPD was formed, in part, to provide for the control and conservation of flood and stormwaters, and for the protection of watercourses, watersheds, public highways, and life and property in the VCWPD boundary from damage or destruction from these waters. Goals of the VCWPD include:

- > Comprehensive, long range watershed planning
- > Collaboration with watershed stakeholders
- > Administration of adopted regulations, policies and resolutions
- > Responsible and accountable use of public resources
- > Excellence in public service

The Project is located in VCWPD Zone 2 that follows the boundaries of the Santa Clara River Watershed, and local coastal drainages in the cities of Ventura and Oxnard. The primary ordinance establishing VCWPD authority and the requirement to obtain permits for any encroachment into VCWPD jurisdictional channels, including rights-of-way, is VCWPD Ordinance WP-2, an ordinance relating to the protection and regulation of flood control facilities and watercourses. The VCWPD also implements Flood Plain Management Ordinance 3841 on behalf of the County of Ventura to ensure compliance with the NFIP. This includes permit review for structures built in the floodplain and evaluation of site plans for developments that include identified floodplains.

The Project does not propose to build a structure in a floodplain area, so it does not require a permit from the VCWPD. Further, the objective of the spillway modification component of the Project is to increase the design capacity of the spillway to convey the revised IDF in order to meet current regulatory requirements. Accordingly, the Project is not anticipated to influence the current VCWPD zoning or require a permit from the VCWPD.

5.10.3 Impacts and Mitigation Measures

This section discusses potential impacts to hydrology, water quality, and geomorphology in relationship with the Project and alternatives. The potential impacts were evaluated based on information obtained from available documents, reports, and websites and by assessing the potential for construction and support actions involved with the Project and each alternative to impact water resources, water quality, and geomorphology.

5.10.3.1 *Significance Criteria*

UWCD reviewed Appendix G of the CEQA Guidelines to identify criteria to consider in determining whether the Project would have a significant impact on hydrology and water quality. In addition, based on the nature of the potential Project impacts to fluvial geomorphology, UWCD reviewed other EIRs in the nearby surrounding area addressing the Santa Clara River watershed (including the Newhall Ranch Resource Management and Development Plan and Spineflower Conservation Plan EIS/EIR [CDFW 2010]) in order to identify additional criteria to consider in determining whether the Project would have a significant impact on geomorphology. These criteria consider whether the Project would:

- a. Violate any water quality standards or waste discharge requirements.
- b. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.
- c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river in a manner which would result in flooding on- or off-site.

- d. Result in a substantial reduction in geomorphic function (i.e., channel stability) in lower Piru Creek.²
- e. Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.
- f. Otherwise substantially degrade water quality.
- g. Expose people or structures to a significant risk of flooding because of dam or levee failure.
- h. Deposit sediment and debris materials within existing channels and allied obstruction of flow, reduce the capacity of the channel during design storm conditions, and/or increase runoff that would alter flood flows in Areas of Special Flood Hazard and regulatory channels².
- i. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
- j. Result in scouring of the riverbed and floodplain to the point of causing a substantial increase in the frequency and magnitude of scouring of riparian vegetation in lower Piru Creek².
- k. Place housing within a 100-year flood hazard area, as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- l. Place within a 100-year floodplain structures which would impede or redirect flood flows.
- m. Result in inundation by seiche, tsunami, or mudflow.

Criterion h is not analyzed further as its elements are covered in the analysis of criterion b regarding erosion and sedimentation, and criteria c, e, and g regarding reduction of channel capacity and/or increased runoff and associated flooding risks. The Project would not result in impacts with regard to criterion i because water released from Lake Piru Reservoir is used to recharge groundwater aquifers and supply potable water to municipalities, industry, and agriculture. If flow releases are reduced during construction, it could affect groundwater recharge and seawater intrusion. However, water releases are planned to continue per existing operations during construction. As such, construction of the Project is not expected to impact groundwater infiltration or otherwise interfere with groundwater recharge. In addition, the Project would not use groundwater as a water source during construction, so it would not directly impact groundwater supply, and there would be no impacts to downstream water rights.

The Project would not result in impacts with regard to criterion j because UWCD would maintain existing water releases during Project construction. In addition, the work areas would be dry during construction. Therefore, the activities would not impact frequency and magnitude of scouring of riparian vegetation in lower Piru Creek. Following construction, the Project would increase the design capacity of the spillway to convey the revised IDF in order to meet current regulatory requirements and construct a new outlet works system to protect the integrity of Santa Felicia Dam in the case of a seismic event and create a more reliable system to deliver water releases downstream of the dam. The Project does not include any changes to the current operations and would not affect the existing hydrologic regime in which periodic spill events occur approximately every five to seven years. Accordingly, operation of the modified spillway and new outlet works would not increase the frequency or magnitude of scouring of the riverbed, floodplain, or riparian vegetation, and there would be no impact; therefore, this criterion is not discussed further below.

Similarly, the Project would result in no impacts with regard to criteria k, l, or m because the Project does not involve construction of housing in a flood hazard area and would not increase the risk of flooding

² Indicates a criterion used to address geomorphology impacts in other local watershed related EIRs.

potential downstream during construction or operation, nor would the Project contribute to potential inundation by seiche, tsunami, or mudflow as discussed in Section 5.7, Geology and Soils.

5.10.3.2 Proposed Project

Because the impacts associated with both components of the Project, the spillway modifications and the construction of new outlet works, are similar with respect to the significance criteria outlined above, the impact analysis includes a combined discussion of both components. Where different, the impact analysis addresses each component separately.

Impact HWQ-1: The Project would not violate any water quality standards or waste discharge requirements (Construction - Less than Significant/Operation – No Impact).

Construction

Activities required to construct the modified spillway and new outlet works, including site clearing, excavation, grading, fill placement, and stockpiling, have the potential to expose site soils to erosion and mobilize sediments in stormwater. Additionally, hazardous materials such as fuels, oils, grease, and lubricants from construction equipment could be accidentally released during construction.

Accidental discharge of these materials during construction could adversely affect water quality and/or result in violation of water quality standards. Construction of the Project would require an NPDES General Construction Permit to comply with Section 402 of the federal CWA that would include a SWPPP. The SWPPP would include provisions to control erosion and sedimentation, as well as spill prevention measures to avoid and, if necessary, clean up accidental releases of hazardous materials.

Through compliance with NPDES Construction General Permit requirements, including the preparation and implementation of a SWPPP and BMPs, potential violations of water quality standards and/or waste discharge requirements would be minimized; therefore, impacts associated with construction of the Project would be less than significant.

Operation

The Project would increase the design capacity of the spillway to convey the revised IDF to meet current regulatory requirements and construct a new outlet works system to protect the integrity of Santa Felicia Dam in the case of a seismic event and create a more reliable system to deliver water releases downstream of the dam. The Project does not include any changes to the current operations or the existing Project permit requirements. Further, operation of the modified spillway and outlet works would not generate additional traffic, require herbicide or pesticide use, or generate other types of polluted runoff that would require regulation. Accordingly, operation of the modified spillway and new outlet works would not impact water quality standards or waste discharge requirements.

Impact HWQ-2: The Project would not substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site (Construction - Less than Significant/Operation – Significant but Mitigable to Less than Significant).

Impact HWQ-3: The Project would not substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river in a manner which would result in flooding on- or off-site (Construction - Less than Significant/Operation – Significant, but Mitigable to Less than Significant).

Construction

Construction of the spillway modifications and new outlet works would require grading and excavation of previously disturbed and undisturbed soils and bedrock that would result in exposed soils subject to erosion, which could potentially increase sedimentation in Lake Piru Reservoir and Piru Creek. The

largest source of erosion would be uncontrolled drainage over exposed slopes during construction. Project excavation, grading, and stockpiling during the 24-month construction period for the spillway modification component of the Project and the 24-month construction period for the outlet works system component of the Project would result in an increase in the amount of soil exposed to wind and water erosion resulting in a potentially significant impact. However, implementation of standard BMPs specified in a SWPPP required under the NPDES Construction General Permit would reduce the potential for erosion and siltation during construction. As such, impacts relative to erosion and siltation during construction would be less than significant.

Historically, the highest levels of precipitation in the region occur during the months of January through April along with the highest potential for spills to occur at the dam. As discussed in Section 5.10.1.2, Hydrology, Piru Creek, spill events at Santa Felicia Dam occur once every five to seven years on average. During construction activities, the existing outlet works would be functional and current water releases would be maintained, but the spillway would not be able to convey flood flows should they occur during the 24-month construction period for the spillway modification component of the Project. Accordingly, the construction timing and approach would be developed in consultation with the DSOD and FERC to minimize potential risks of flooding during the construction activities by lowering the water levels in Lake Piru Reservoir to provide additional storage capacity; using the existing outlet works to maintain water releases and manage water levels within Lake Piru Reservoir; and, following completion, using the new outlet works system in conjunction with the existing outlet works to maintain lower water levels in Lake Piru Reservoir should high flows occur. The final construction plan including schedule and sequencing would be reviewed and approved by the DSOD and FERC prior to implementation and, as such, impacts associated with flooding on- or off-site during construction of the modified spillway and new outlet works system would be less than significant.

Operation

The spillway modification component of the Project would increase the design capacity of the spillway to convey the revised IDF to meet current regulatory requirements. The Project does not include any changes to the current operations. Given that flood flows would continue to be conveyed through the spillway chute and associated channel and current operations would remain unchanged, operation of the modified spillway is not expected to result in substantial erosion, siltation, or flooding and impacts would be less than significant.

Upstream of Santa Felicia Dam, the proposed 6.5-foot increase in the dam crest elevation would not increase the working capacity of the reservoir; rather, there would be no change to the existing operations or the existing ranges in water levels in Lake Piru Reservoir that were described in Section 2.4, Lake Piru Reservoir Operation. Accordingly, the modified dam crest elevation would not result in substantial erosion, siltation, or flooding, and there would be no impact.

The new outlet works system would be constructed along the left abutment of Santa Felicia Dam and the existing outlet works on the right abutment of the dam would be decommissioned. The shift from the right abutment to the left abutment would result in a modification of lower Piru Creek channel downstream of the dam. Specifically, this change would result in the dewatering of between 480-feet and 1,200-feet of existing channel in lower Piru Creek (depending on the final design) that is situated between the existing outlet works and the confluence of the new discharge channel that will be constructed to connect the new water release point to the main lower Piru Creek channel. Accordingly, this component of the Project would alter the existing drainage pattern downstream of Santa Felicia Dam and has the potential to result in a significant impact through substantial erosion, siltation, or flooding. However, with incorporation of MM BIO-4, the potential impact would be reduced to a less than significant level.

Lastly, the Project would reduce the likelihood that flood flows would overtop the dam and the potential for dam failure due to erosion of the dam face. Accordingly, the Project would result in a beneficial impact associated with the reduction in the potential for erosion downstream of the dam.

Mitigation Measures

MM BIO-4. Design and Construct a Geomorphically Stable Channel connecting the New Outlet Works Release Point to the Main Lower Piru Creek Channel. This mitigation measure is discussed in Section 5.5.4.2.

Residual Impact

Implementation of MM BIO-4 would reduce impacts associated with the abandonment of a portion of the existing channel situated between the existing water release point and the UWCD-Rancho Temescal property line to a less than significant level by constructing a new channel to connect the new water release point to the main lower Piru Creek channel. The new channel would be geomorphically stable, provide high quality habitat for southern California steelhead, and convey the range of flows required by the Santa Felicia Hydroelectric Project FERC license and the DSOD. Accordingly, residual impacts would be less than significant.

Impact HWQ-4: The Project would not result in a substantial reduction in geomorphic function (i.e., channel stability) in lower Piru Creek (Construction - Less than Significant/Operation – Significant but Mitigable to Less than Significant).

Construction

Project construction would require grading and excavation of previously disturbed and undisturbed soils and bedrock. These activities during the 24-month construction period for the spillway modification component of the Project and the 24-month construction period for the outlet works system component of the Project would result in an increase in the amount of soil exposed to wind and water erosion that could impact the geomorphic function of lower Piru Creek if mobilized, transported, and deposited within the channel. However, implementation of standard BMPs as required under the NPDES General Construction Permit would reduce the potential for erosion and/or siltation during construction. Through compliance with all NPDES permit requirements, including the preparation and implementation of a SWPPP and BMPs, construction of the Project would not result in significant erosion or siltation. As such, impacts relative to the geomorphic function of lower Piru Creek during construction would be less than significant.

Operation

The spillway modification component of the Project would increase the design capacity of the spillway to convey the revised IDF to meet current regulatory requirements. To meet this objective, the existing spillway structure would be modified by either deepening or widening the spillway chute and raising the dam crest. This component does not involve modifying the spillway channel downstream of the spillway chute or lower Piru Creek, nor does it involve any changes in the existing operations of the dam. Accordingly, there would be no impact to geomorphic function in lower Piru Creek associated with the operation of the modified spillway.

The new outlet works system would be constructed along the left abutment of Santa Felicia Dam and the existing outlet works on the right abutment of the dam would be decommissioned. The shift from the right abutment to the left abutment would result in a modification of lower Piru Creek channel downstream of the dam. Specifically, this change would result in the dewatering of between 480-feet and 1,200-feet of existing channel in lower Piru Creek (depending on the final design) that is situated between the existing outlet works and the confluence of the new discharge channel that will be constructed to connect the new water release point to the main lower Piru Creek channel. Accordingly, this component of the Project would alter the existing drainage pattern downstream of Santa Felicia Dam and has the potential to significantly impact the geomorphic function of lower Piru. However, with incorporation of MM BIO-4, the potential impact would be reduced to a less than significant level.

Mitigation Measures

MM BIO-4. Design and Construct a Geomorphically Stable Channel connecting the New Outlet Works Release Point to the Main Lower Piru Creek Channel. This mitigation measure is discussed in Section 5.5.4.2.

Residual Impact

Implementation of MM BIO-4 would reduce impacts associated with abandonment of between 480 feet and 1,200 feet of existing channel in lower Piru Creek (depending on the final design) to a less than significant level by creating channel of similar length that is geomorphically stable and conveys the range of flows required by the Santa Felicia Hydroelectric Project FERC license and the DSOD as well as the estimated sediment loads without excessive scour or deposition within the channel or immediately downstream. Accordingly, residual impacts would be less than significant.

Impact HWQ-5: The Project would not create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff (Construction - Less than Significant/Operation – No Impact).

Construction

The construction activities and staging areas associated with the Project would be conducted in existing disturbed areas. The spillway widening component and the new outlet works system would result in increased areas of impermeable surfaces thereby potentially leading to increased runoff rates and quantities. However, these increases would not exceed the capacity of the existing or planned storm drainage systems as the runoff associated with the spillway widening would be contained and conveyed through the spillway that is designed to convey the IDF of 220,000 cfs which is orders of magnitude larger than localized storm runoff. In regard to the new outlet works system, the runoff associated with the intake structure would be conveyed back into Lake Piru Reservoir which has the storage capacity to contain such runoff, and the runoff associated with the new water release infrastructure would be conveyed into the lower Piru Creek channel which has sufficient capacity to convey localized storm runoff in addition to the higher magnitude water releases. Accordingly, the Project would not result in impacts relative to creating or contributing runoff that could exceed the capacity of existing or planned stormwater drainage systems.

Construction activities including site clearing, excavation, grading, fill placement, and stockpiling would have the potential to expose site soils to erosion and mobilize sediments in stormwater. Additionally, hazardous materials such as fuels, oils, grease, and lubricants from construction equipment could be accidentally released during construction. Increased erosion and the accidental discharge of hazardous materials during construction could adversely affect water quality and/or result in violation of water quality standards. Construction of the Project would require obtaining a NPDES General Construction Permit to comply with Section 402 of the federal CWA that would include a SWPPP. The SWPPP would include provisions to control erosion and sedimentation, as well as spill prevention measures to avoid and, if necessary, clean up accidental releases of hazardous materials. Through compliance with NPDES Construction General Permit requirements including the preparation and implementation of a SWPPP and BMPs, construction of the Project is not expected to provide substantial sources of polluted runoff. As such, impacts would be less than significant.

Operation

The Project does not include any changes to the current operations or the existing Project permit requirements. Additionally, operation of the modified spillway and new outlet works would not create or contribute runoff that would exceed existing or planned drainage systems or provide additional sources of polluted runoff. Further, operation of the modified spillway and outlet works would not generate additional traffic, require herbicide or pesticide use, or generate other types of polluted runoff that would require regulation. Therefore, no impacts would occur.

Impact HWQ-6: The Project would not otherwise substantially degrade water quality (Construction - Less than Significant/Operation – No Impact).

Construction

During construction, water releases are planned to continue per existing operations. As such, construction of the Project is not expected to affect groundwater or surface water quality. Further, as described previously, UWCD would obtain coverage under the General Construction NPDES permit and would implement a SWPPP, which would minimize any construction-related erosion or sedimentation. As such, the construction of the proposed Project would not degrade downstream groundwater or surface water quality. Impacts would be less than significant.

Operation

The Project does not include any changes to the current operations or the existing Project permit requirements. Accordingly, operation of the modified spillway and new outlet works would not substantially degrade water quality, generate additional traffic, require herbicide or pesticide use, or generate other types of polluted runoff that may degrade water quality. Accordingly, operation of the modified spillway and new outlet works would have no impact on water quality.

Impact HWQ-7: The Project would reduce the exposure of people and structures to a significant risk of flooding because of dam or levee failure (Construction – Less than Significant/Operation – Beneficial Impact).

Impact HWQ-8: The Project would increase the capacity of flood control facilities and watercourses (Construction – Less than Significant/Operation – Beneficial Impact).

Construction

Historically, the highest levels of precipitation in the region occur during the months of January through April along with the highest potential for spills to occur at the dam. As discussed in Section 5.10.1.2, Hydrology-Piru Creek, spill events at Santa Felicia Dam occur once every five to seven years on average. During construction activities, the existing outlet works would be functional and current water releases would be maintained, but the spillway would not be able to convey flood flows should they occur during the 24-month construction period for the spillway modification component of the Project. Accordingly, the construction timing and approach would be developed in consultation with the DSOD and FERC to minimize potential risks of flooding during the construction activities by lowering the water levels in Lake Piru Reservoir to provide additional storage capacity and using the existing outlet works and, following completion, the new outlet works system to maintain lower water levels should high flows occur. The final construction plan including schedule and sequencing would be reviewed and approved by the DSOD and FERC prior to implementation and, as such, impacts associated with potential flooding risk during construction of the modified spillway and new outlet works system would be less than significant.

Operation

The Project would increase the design capacity of the spillway to convey the revised IDF to meet current regulatory requirements and construct a new outlet works system to protect the integrity of Santa Felicia Dam in the case of a seismic event and create a more reliable system to deliver water releases downstream of the dam. By increasing the capacity of the spillway and reducing the seismic risk associated with the existing outlet works, the risk of overtopping the dam and resulting flooding hazards would be reduced, thereby increasing flood protection for people and structures downstream. The Project will provide a beneficial impact.

5.10.3.3 Labyrinth Alternative

Under this alternative, operation would be the same as that for the Project, and the construction requirements would be similar to the requirements provided for the Project with the exception that the dam crest would not need to be raised and it would involve significantly more demolition and concrete placement. However, the significance of the impacts relative to hydrology and water quality associated with the Labyrinth Alternative would be similar in extent and intensity as those described for the Project.

5.10.3.4 No Project Alternative

Under the No Project Alternative, there would be no improvements to the Santa Felicia Dam, spillway, or outlet works system. The Santa Felicia Dam spillway would continue to have a conveyance capacity less than the established regulatory IDF. As such, the No Project alternative would have a significant and unmitigable impact through increasing the risk of flooding (Impact HWQ-3), exceed the capacity of stormwater drainage systems (Impact HWQ-5), and increase the risk of people or structures to flooding because of dam failure (Impact HWQ-8).

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5.11 Land Use and Planning

This section describes the existing land uses in the Project area and describes activities related to the Project and alternatives that have the potential to impact these land uses. It also considers agricultural and recreational uses of the land, although these topics are described in further detail in their respective sections of 5.3 and 5.16.

Table 5.11-1 Summary of Impacts on Land Use and Planning

Impact	Project	Labyrinth Alternative	No Project Alternative	Mitigation Measures
The Project would not physically divide an established community, or otherwise result in an incompatible land use.	Construction – O/Operation – O	Construction – O/Operation – O	Operation – O	None required
The Project would not conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.	Construction – O/Operation – O	Construction – O/Operation – O	Operation – O	None required
The Project would not conflict with any applicable habitat conservation or natural community conservation plan.	Construction – O/Operation – O	Construction – O/Operation – O	Operation – O	None required

Note:

- O = No Impact
- L = Less than Significant Impact
- S = Significant Impact, but Mitigable to Less than Significant
- U = Significant Unavoidable Impact
- B = Beneficial Impact

5.11.1 Existing Conditions

Santa Felicia Dam and Lake Piru Reservoir are located in an unincorporated area of Ventura County. Both are under the ownership of UWCD, which owns approximately 2,200 acres around and including Lake Piru Reservoir (FERC 2007). The nearest community is the town of Piru, which is located approximately five miles southwest of the dam. As of 2010, Piru had a population of 2,063 with a median population age of 29 (U.S. Census Bureau 2010). The Ventura County General Plan designates the Project area as Open Space (minimum 10 acres). To the south is the urban area of Piru, which is bordered by land designated as Agricultural (Ventura County 2011).

The Project area is bordered by the Los Padres National Forest and the Sespe Wilderness to the northwest and by the Angeles National Forest to the northeast. Sections of Bureau of Land Management (BLM)-managed land are also located to the southwest, east, and northeast (PLIA 2017).

Immediately south, east, and west of the Project are lands affiliated with Rancho Temescal, a 6,000-acre, privately-owned working thoroughbred farm. In addition to equestrian care and activities, Rancho Temescal also provides locations for commercial filming and maintains over 600 acres of agricultural land (Rancho Temescal 2017).

5.11.2 Regulatory Framework

The regulations below pertain to land use in the Project area.

5.11.2.1 Federal

FERC has the authority to manage land uses within federally licensed hydroelectric project boundaries and issues licenses subject to conditions. Licenses for alterations or additions to federally-licensed projects are also obtained through FERC. When other federal or local land regulations are present, FERC is often treated as an overlay on other restrictions (Francis and Huang 2005). UWCD has a license from FERC (FERC License No. 2153-CA) for the Santa Felicia Dam Hydroelectric Project. In compliance with Articles 413 and 4(e), Conditions No. 17 and 20, UWCD has prepared a Land Resource Management Plan, which describes fire management and response procedures, sign management, visual resources management, and road and facilities maintenance for the dam (UWCD 2009a).

5.11.2.2 State

5.11.2.2.1 California Government Code – Section 53091

This code exempts a local agency from compliance with zoning and building ordinances when constructing facilities for the storage and transmission of water. Since the Santa Felicia Dam and its appurtenances are necessary for the production, generation, storage, treatment, or transmission of water or electricity by a local agency, these facilities are exempt from the Ventura County zoning and building ordinances.

5.11.2.3 Local

Although Santa Felicia Dam is located within unincorporated Ventura County, it is exempt from County permit requirements because it is a State water storage and power generation facility, regulated by a license issued by FERC under the Federal Powers Act. Therefore, the Project is not subject to the provisions of the Ventura County General Plan or other local ordinances, regulations, or policies. The description of local policies below is provided for informational purposes only.

5.11.2.3.1 Save Open-Space and Agricultural Resources Initiative

The Project area is located in land designated as Open Space by Ventura County (Ventura County 2011) and is also marked as Open Space under the Ventura County “Save Open-Space and Agricultural Resources” (SOAR) initiative. SOAR was first passed on November 3, 1998 and was recently reinstated in 2016 with various edits. Although the Project is located in Ventura County, as described in Section 5.11.2.2.1, the Project facilities are exempt from this ordinance.

5.11.2.3.2 Piru Area Plan

The Piru Area Plan serves as the Land Use Plan for the Piru Area of Interest, and includes housing, business, industry, open space, agriculture, and community facilities. All zoning and development must be compatible with the Piru Land Use Plan (Figure 5.11-1).

The Ventura County General Plan also states that UWCD will manage water conservation, flood control, recreation, hydroelectric generation, and other appropriate purposes of Lake Piru Reservoir (Ventura County 2011). UWCD operates Lake Piru Recreation Area under Ventura County Conditional Use Permit (CUP) No. 2949, Lake Piru Recreation Area, Modified Conditional Use Permit No. LU07-0088. This land use permit applies to the Lake Piru Recreation Area only and not the dam, spillway, powerplant or appurtenances.

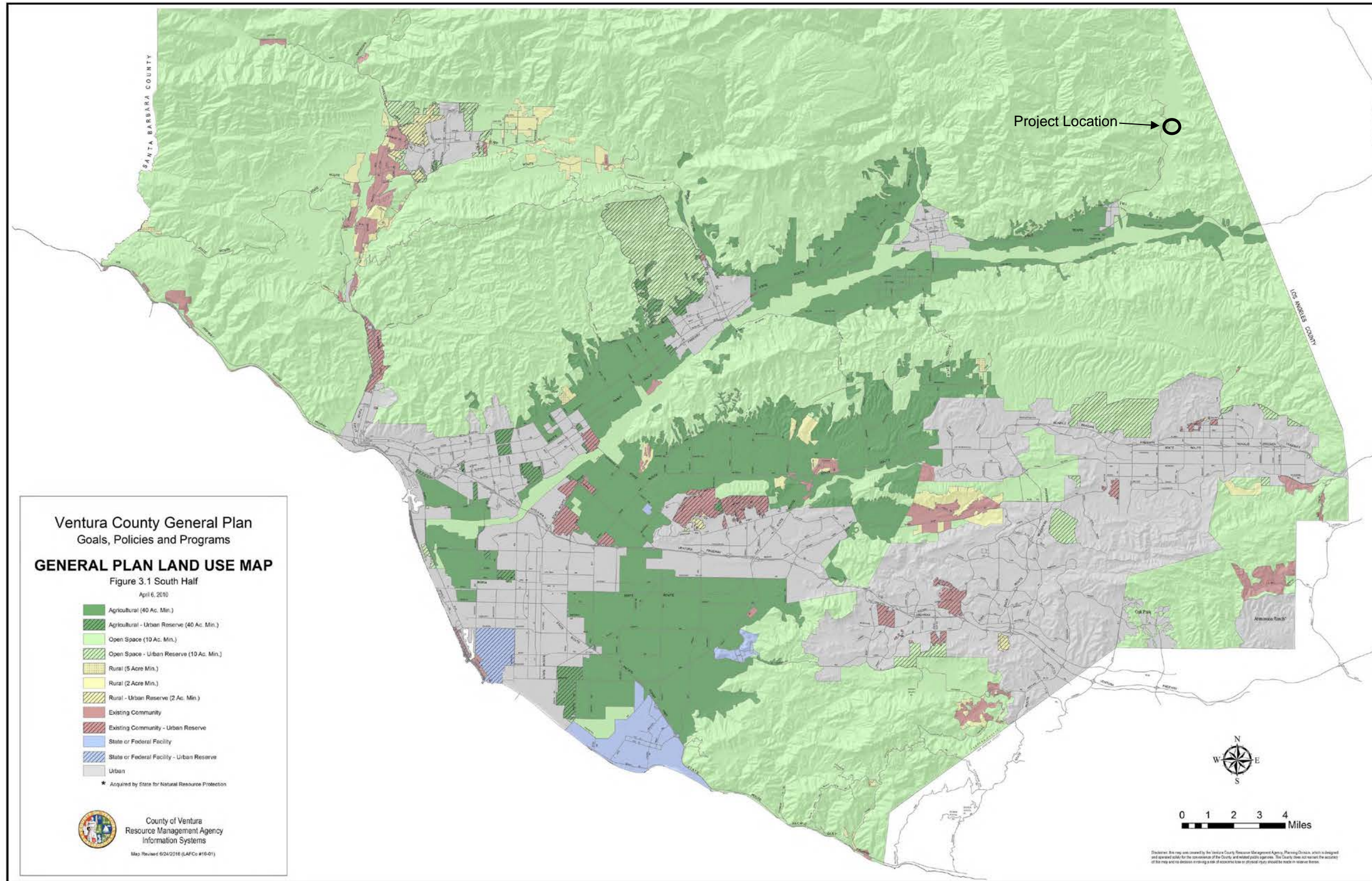


Figure 5.11-1 Ventura County General Land Use Map

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5.11.3 Impacts and Mitigation Measures

5.11.3.1 *Significance Criteria*

UWCD reviewed Appendix G of the CEQA Guidelines to determine whether the Project would result in significant impacts related to land use and planning. The criteria listed below consider if the Project would:

- a. Physically divide an established community, or otherwise result in an incompatible land use.
- b. Conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.
- c. Conflict with any applicable habitat conservation or natural community conservation plan.

The Project would occur on land designated as Open Space by Ventura County. The nearest town to Santa Felicia Dam is Piru, which is located approximately five miles southwest. The Project would increase spillway capacity at Santa Felicia Dam and allow UWCD to continue to meet the conditions of its 2008 FERC license for the Santa Felicia Hydroelectric Project. These improvements would not occur within or through an established community; therefore, no established community would be physically divided or impacted by construction or operations. Further, the Project would not result in changes to existing land use. The Project area is under jurisdiction of UWCD, and the Project must be operated in accordance with the 2008 FERC license for the Santa Felicia Dam Hydroelectric Project. As described in Section 5.11.2.3, per California Government Code Section 53091, the Project is not subject to the Ventura County General Plan or Piru Area Plan; therefore, the project would not result in conflicts with any land use plans. Lastly, the Project is not located within any habitat conservation planning areas or natural community conservation planning areas. Therefore, no impacts with regard to significance criteria a, b, or c would occur.

5.11.3.2 *Proposed Project*

As described above, no land use impacts would occur as a result of the Project.

5.11.3.3 *Labyrinth Alternative*

The Labyrinth Alternative would result in no impacts to land use and planning because it is in the same location as the proposed Project and construction would occur using the same access roads and staging areas. Therefore, the Labyrinth Alternative would not result in any changes to existing land use, and it would not conflict with any land use plans, natural community, or habitat conservation plans.

5.11.3.4 *No Project Alternative*

Under the No Project Alternative, no changes to the existing land use would occur; therefore, there would be no impacts.

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5.12 Mineral Resources

This section describes the environmental and regulatory settings of mineral resources in the vicinity of the Project and discusses potential impacts associated with construction and operation of the Project components on mineral resources. Table 5.12-1 summarizes the impacts on mineral resources that would result from implementation of the Project or alternatives.

Table 5.12-1 Summary of Impacts on Mineral Resources

Impact	Project	Labyrinth Alternative	No Project Alternative	Mitigation Measures
Project construction and operation would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State.	Construction – O/Operation – O	Construction – O/Operation – O	Operation – O	None Required
Project construction and operation would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.	Construction – O/Operation – O	Construction – O/Operation – O	Operation – O	None Required

Note:

- O = No Impact
- L = Less than Significant Impact
- S = Significant Impact, but Mitigable to Less than Significant
- U = Significant Unavoidable Impact
- B = Beneficial Impact

5.12.1 Existing Conditions

By California State Law “mineral” refers to any naturally-occurring chemical element or compound or groups of elements and compounds formed from inorganic processes and organic substances, including aggregate resources (sand and gravel). This definition includes coal, peat, and bituminous rock; however, geothermal resources, natural gas, and petroleum are not included (CDOC 2017c). No mineral areas of statewide or regional significance or areas that contain identified mineral resources (i.e., Mineral Resource Zone 2 (MRZ-2) lands) are located in the Project area (CDOC 1982; California Division of Mines and Geology 1981).

5.12.2 Regulatory Framework

The federal, state, and local regulations related to mineral resources that may apply to the Project are described below.

5.12.2.1 Federal

No Federal regulations that relate to mineral resources apply to this Project.

5.12.2.2 State

No State regulations that relate to mineral resources apply to this Project.

5.12.2.3 Local

Although Santa Felicia Dam is located in unincorporated Ventura County, it is exempt from local requirements because it is a water storage and power generation facility, regulated by a license issued by

FERC under the Federal Powers Act. Therefore, the Project is not subject to the provisions of the Ventura County General Plan or other local ordinances, regulations, or policies.

5.12.2.3.1 Ventura County General Plan

The relevant goals and policies associated with the Ventura County General Plan (Ventura County 2016a) are provided as follows for informational purposes:

- **Goals**

1. Ensure that all mineral extractions are conducted in a manner which protects the environment and the public's health, safety and welfare.

- **Policies**

1. Applications for *mineral resource development* shall be reviewed to assure minimal disturbance to the environment and to assure that lands are reclaimed for appropriate uses which provide for and protect the public health, safety and welfare.

5.12.3 Impacts and Mitigation Measures

5.12.3.1 Significance Criteria

UWCD reviewed Appendix G of the CEQA Guidelines to determine whether the Project would result in significant impacts related to mineral resources. The criteria listed below consider if the Project would:

- a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State.
- b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

The Project area does not contain known mineral resources that would be of value to local or state residents nor does it contain locally significant mineral resources as designated by the CDOC or the Ventura County General Plan (2011). Therefore, no impacts would occur under either significance criteria, and these are not discussed further.

5.12.3.2 Proposed Project

As described above, the Project would have no impacts to mineral resources.

5.12.3.3 Labyrinth Alternative

The Labyrinth Alternative would require a greater amount of concrete than the Proposed Project: this material would be supplied by the contractor during construction and would not impact local mineral resources. This alternative would occur in the same footprint, lacking mineral resources of value and of local importance, as the Proposed Project, and therefore would have no impacts on mineral resources.

5.12.3.4 No Project Alternative

The No Project alternative would have no impacts on mineral resources because no construction or dam operational changes would occur and thus, there would be no disturbance of any mineral resources. Further, there are no mineral resources of value or of local significance in the vicinity of the Project.

5.13 Noise

This section describes the existing sound levels and ground-borne vibration associated with the Santa Felicia Dam and evaluates the potential impacts of the proposed Project and alternatives to this baseline. This analysis focuses on noise impacts on humans. Noise-related impacts to wildlife are addressed in Section 5.5, Biological Resources, and noise-related impacts to recreation are addressed in Section 5.16, Recreation. Because noise levels decrease relatively rapidly as distances increase, the region of influence for noise is relatively small and this analysis focuses on noise levels within one mile from the Santa Felicia Dam and less than 1,000 feet from the roadway centerline of affected roads.

Table 5.13-1 Summary of Impacts on Noise

Impact	Project	Labyrinth Alternative	No Project Alternative	Mitigation Measures
Impact NOISE-1: The Project would expose persons to, or generate, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	Construction – U/Operation - O	Construction – U/Operation - O	Operation - O	MM NOISE-1: Noise Reduction and Control Practices
Impact NOISE-2: The Project would expose people to, or generate, excessive vibration or ground-borne noise levels.	Construction – L/Operation - O	Construction – L/Operation - O	Operation - O	None required.
Impact NOISE-3: The Project would cause substantial temporary or periodic increases in ambient noise levels in the Project vicinity above levels existing without the Project.	Construction – U/Operation - O	Construction – U/Operation - O	Operation - O	MM NOISE-1: Noise Reduction and Control Practices
The Project would not cause a substantial permanent increase in ambient noise levels in the Project vicinity above noise levels existing without the Project	Construction – O/Operation - O	Construction – O/Operation - O	Operation - O	None required.
The Project is not located with 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, and would not expose people residing or working in the Project area to excessive noise levels.	Construction – O/Operation - O	Construction – O/Operation - O	Operation - O	None required.
The Project is not within the vicinity of a private airstrip, and would not expose people residing or working in the project area to excessive noise levels.	Construction – O/Operation - O	Construction – O/Operation - O	Operation - O	None required.

Note:

- O = No Impact
- L = Less than Significant Impact
- S = Significant Impact, but Mitigable to Less than Significant
- U = Significant Unavoidable Impact
- B = Beneficial Impact

The following sections provide definitions of noise and vibration measurements and describe the Project-specific measurements associated with each.

5.13.1 Existing Conditions

5.13.1.1 Fundamentals of Acoustics

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. When sound becomes excessive or unwanted, it is referred to as noise. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise and its appropriateness in the setting, the time of day and the type of activity during which the noise occurs, and the sensitivity of the individual.

Sound (noise) levels are measured and quantified with several metrics. All of them use the logarithmic decibel (dB) scale with 0 dB roughly equal to the threshold of human hearing. A property of the decibel scale is that the sound pressure levels of two separate sounds are not directly additive. For example, if a 50 dB sound is added to another 50 dB sound, the total is only a 3 dB increase (to 53 dB). Thus, every 3 dB change in sound levels represents a doubling or halving of sound energy. Related to this is the fact that a less-than-3 dB change in sound levels is imperceptible to the human ear.

The frequency of sound is a measure of the pressure fluctuations per second, measured in hertz (Hz). Most sounds do not consist of a single frequency but consist of a broad band of frequencies differing in level. The characterization of sound level magnitude with respect to frequency is the sound spectrum. Many rating methods exist to analyze sound of different spectra. The method used for this analysis is A-weighting (there are also B- and C-weighting filters). The A-weighted scale (dBA) most closely approximates how the human ear responds to sound at various frequencies by progressively deemphasizing frequency components below 1,000 Hz and above 6,300 Hz and reflects the relative decreased sensitivity of humans to both low and extremely high frequencies (Federal Highway Administration [FHWA] 2006). Table 5.13-2 lists typical sound levels from representative sources.

Table 5.13-2 Typical Noise Levels (Measured at a Distance a Person Would Typically be From the Source)

Typical Noise Source	Sound Level (dBA)
Grand Canyon at Night (no roads, birds, wind)	10
Computer	37-45
Refrigerator	40-43
Typical Living Room	40
Forced Hot Air Heating System	42-52
Microwave	55-59
Normal Conversation	55-65
Clothes Dryer	56-58
Dishwasher	63-66
Clothes Washer	65-70
Phone	66-75
Push Reel Mower	68-72
Hairdryer	80-95
Vacuum Cleaner	84-89

Typical Noise Source	Sound Level (dBA)
Leaf Blower	95-105
Circular Saw	100-104
Maximum Output of a Stereo	100-110
Jet Fly-over at 1,000 Feet	110

Source: Noise Pollution Clearinghouse 2012

The duration of noise and the time period at which it occurs are important factors in determining the impact of noise. Several methods are used for describing variable sounds including the equivalent level (L_{eq}), the maximum level (L_{max}), and the percent-exceeded levels. These metrics are derived from a large number of moment-to-moment A-weighted sound level measurements. Some common metrics reported in community noise monitoring studies are described below:

- > L_{eq} , the equivalent level, can describe any series of noise events of arbitrary duration, although the most common averaging period is hourly. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events, and L_{eq} is the common energy-equivalent sound/noise descriptor.
- > L_{max} is the maximum sound level during a given time. L_{max} is typically due to discrete, identifiable events such as an airplane overflight, car or truck passing by, or a dog barking.
- > L_{90} is the sound level in dBA exceeded 90 percent of the time during the measurement period. L_{90} is close to the lowest sound level observed. It is essentially the same as the residual sound level, which is the sound level observed when no obvious nearby intermittent noise sources occur.
- > L_{50} is the median sound level in dBA exceeded 50 percent of the time during the measurement period.
- > L_{10} is the sound level in dBA exceeded only 10 percent of the time. It is close to the maximum level observed during the measurement period. L_{10} is sometimes called the intrusive sound level because it is caused by occasional louder noises like those from passing motor vehicles.

In determining the daily measure of community noise, it is important to account for the difference in human response to daytime and nighttime noise. Noise is more disturbing at night than during the day, and noise indices have been developed to account for the varying duration of noise events over time as well as community response to them. The Day-Night Average Level (L_{dn}) is such an index. L_{dn} represents the 24-hour A-weighted equivalent sound level with a 10 dB penalty added to the "nighttime" hourly noise levels between 10:00 p.m. and 7:00 a.m. Because of the time-of-day penalties associated with the L_{dn} index, the L_{eq} for a continuously operating sound source during a 24-hour period will be numerically less. Noise is also more disturbing the closer a receptor is to the source; noise levels decrease by 6 dB as the distance from its source doubles (FHWA 2011).

5.13.1.2 Fundamentals of Vibration

Ground-borne vibration consists of waves transmitted through solid material. Several types of wave motions exist in solids, unlike air, including compressional, shear, torsional, and bending. The solid medium can be excited by forces, moments, or pressure fields. Ground-borne vibration propagates from the source through the ground to adjacent buildings by surface waves. Vibration may be composed of a single pulse, a series of pulses, or a continuous oscillatory motion. The frequency of a vibrating object describes how rapidly it is oscillating, measured in Hz. Most environmental vibrations consist of a composite, or "spectrum" of many frequencies, and are generally classified as broadband or random

vibrations. The normal frequency range of most ground-borne vibration that can be felt generally starts from a low frequency of less than 1 Hz to a high of about 200 Hz.

Vibration may be defined in terms of the displacement, velocity, or acceleration of the particles in the medium material. In environmental assessments, where human response is the primary concern, velocity is commonly used as the descriptor of vibration level, expressed in millimeters per second (mm/s). The amplitude of vibration can be expressed in terms of the wave peaks or as an average, called the root mean square (rms). The rms level is generally used to assess the effect of vibration on humans. Vibration levels for typical sources of ground-borne vibration are shown in Table 5.13-3 below.

Vibration can produce several types of wave motion in solids including compression, shear, and torsion, so the direction in which vibration is measured is significant and should generally be stated as vertical or horizontal. Human perception also depends to some extent on the direction of the vibration energy relative to the axes of the body. In whole-body vibration analysis, the direction parallel to the spine is usually denoted as the z-axis, while the axes perpendicular and parallel to the shoulders are denoted as the x- and y-axes, respectively.

The two primary concerns with project-induced vibration, the potential to damage a structure and the potential to annoy people, are evaluated against different vibration limits. Studies have shown that the threshold of perception for the average person is a peak particle velocity (PPV) in the range of 0.2 to 0.3 mm/s (0.008 to 0.012 inches per second [in/sec]). Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level. Studies have shown that vibration levels from construction equipment such as dozers, graders, backhoes, etc. are typically less than 0.089 in/sec (PPV) at 25 feet from the source (Caltrans 2013).

Table 5.13-3 Typical Levels of Ground-Borne Vibration and Human or Building Response

Source	Typical Velocity at 50 Feet (mm/s, rms)	Human or Building Response
Blasting from Construction Projects	2.54	Threshold, Minor Cosmetic Damage to Fragile Buildings
Bulldozers and Other Heavy Tracked Construction Equipment	1.42	
Commuter Rail, Upper Range	0.56	
Rapid Transit Rail, Typical Range	0.25	Workplace Annoyance; Difficulty with Vibration Sensitive Tasks
Commuter Rail, Typical Range	0.20	
Bus or Truck Over Bump	0.10	Distinctly Perceptible. Residential Annoyance for Infrequent Events
Rapid Transit Rail, Typical Range	0.08	
Bus or Truck Typical	0.05	Threshold of Perception
Background Vibration	0.01	None

Source: Adapted from Transit Noise and Vibration Assessment (FTA 2006)

5.13.1.3 Existing Noise Environment in Project Area

Santa Felicia Dam is located in Piru Canyon, approximately five miles northeast of the town of Piru in southern Ventura County. The dam is situated in a rural area designated by Ventura County as Open Space (minimum 10 acres). Primary land use categories within the Project area include rural, open space/recreation, and public facility. The dominant noise sources in this area consist of recreational

watercraft on Lake Piru Reservoir, vehicular traffic along local roadways, aircraft overflights, operation of equipment and off-road vehicles at the maintenance area associated with Santa Felicia Dam, and operation of agricultural equipment. The primary roadways accessing the Project area include Piru Canyon Road, Main Street and Center Street in the town of Piru, and State Route 126, which is situated approximately five miles southwest. The closest airport to Lake Piru Reservoir is the Santa Paula Airport, which is located approximately 19 miles to the southwest.

To characterize the baseline ambient noise levels within the ROI, a baseline noise survey was conducted between February 1 and 2, 2018 (Catalyst 2018b). The objective of the survey was to characterize the existing noise environment at two key locations (Figure 5.13-1):

- > The UWCD-Rancho Temescal property line near Santa Felicia Dam to characterize the baseline noise environment adjacent to the nearest sensitive receptor to the proposed construction work at the dam; and,
- > The corner of Main Street and Center Street in the center of downtown Piru to characterize baseline conditions for use in evaluating potential noise impacts associated with Project-related construction traffic.

The survey was conducted over a 25-hour period at each location. The general noise environment during the monitoring period is considered representative of baseline conditions since operations at Santa Felicia Dam were reported as “normal” and no abnormal events were observed or reported in downtown Piru. During the monitoring period, the average hourly temperature ranged between 53.6°F and 83.1°F, and the average hourly wind speed ranged between 3.6 and 11.6 miles per hour (mph) with gusts ranging between 4.9 and 14.8 mph as measured at the Piru-Pacific Avenue weather station operated by the VCAPCD which is located approximately one mile southwest of Location #1 (Catalyst 2018). The collected noise measurement data is summarized in Table 5.13-4.

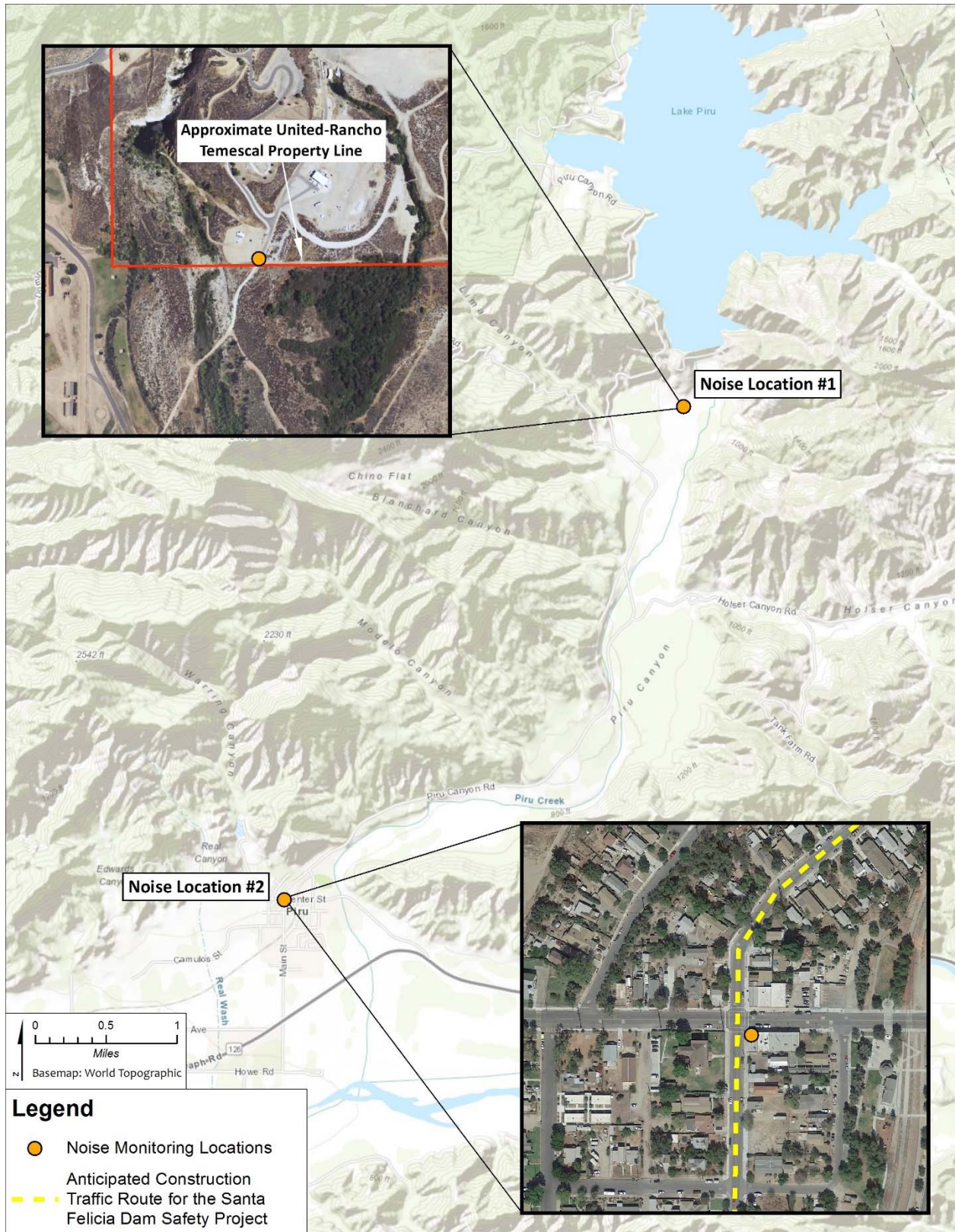


Figure 5.13-1 Baseline Noise Monitoring Locations

Table 5.13-4 Project Area Noise Measurement Results

Measurement	Location #1 (UWCD-Rancho Temescal Property Line Near Santa Felicia Dam)	Location #2 (Downtown Piru)
Run Time (hrs, min, sec)	25:10:16	25:09:33
Start Date	02/01/18	02/01/18
End Date	02/02/18	02/02/18
Start Time	10:04:27 a.m.	9:51:22 a.m.
End Time	11:14:43 a.m.	11:00:55 a.m.
L _{max} (dBA)	81	85.1
L _{min} (dBA)	29.8	31.8
L ₁₀ (dBA)	44.8	62.9
L ₅₀ (dBA)	39	52.6
L ₉₀ (dBA)	33.6	42.2
L _{eq} (dBA)	45.8	59.7
L _{dn} (dBA)	49.2	61.8
CNEL (dBA)	49.4	62.4

Source: Catalyst 2018b

5.13.1.4 Existing Vibration Environment in Project Area

Due to the rural location of the Project site, there is no substantial source of vibration in the Project area. Occasional vibrations may be detected from vehicular movement. Heavy trucks can generate vibrations that vary depending on vehicle type, weight, and pavement conditions. As trucks typically operate on major streets, existing vibration in the Project area is largely related to truck traffic on the surrounding roadways and operation of off-road vehicles during regular maintenance activities at the Santa Felicia Shop and yard. According to the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment guidance document, vibration from traffic is rarely perceptible (FTA 2006).

5.13.1.5 Sensitive Receptors

Some land uses are considered more sensitive to change in noise and vibration levels than others, depending on the population groups and the activities involved. Noise- and vibration-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would each be considered typical noise- and vibration-sensitive receptors. Sensitive receptors within one mile of the Santa Felicia Dam include visitors to Lake Piru Reservoir, the Rancho Temescal Equestrian Center (*i.e., horses and humans*), intermittent filming operations throughout the Rancho Temescal property, two residences located on the Rancho Temescal property immediately downstream of the dam, the Dam Tender's residence located within the Project area, and rural residents within 1,000 feet of the centerline of Piru Canyon Road as shown in Figure 5.13-2. Note that the Dam Tender's residence is for a UWCD employee and therefore worker safety is the applicable standard.

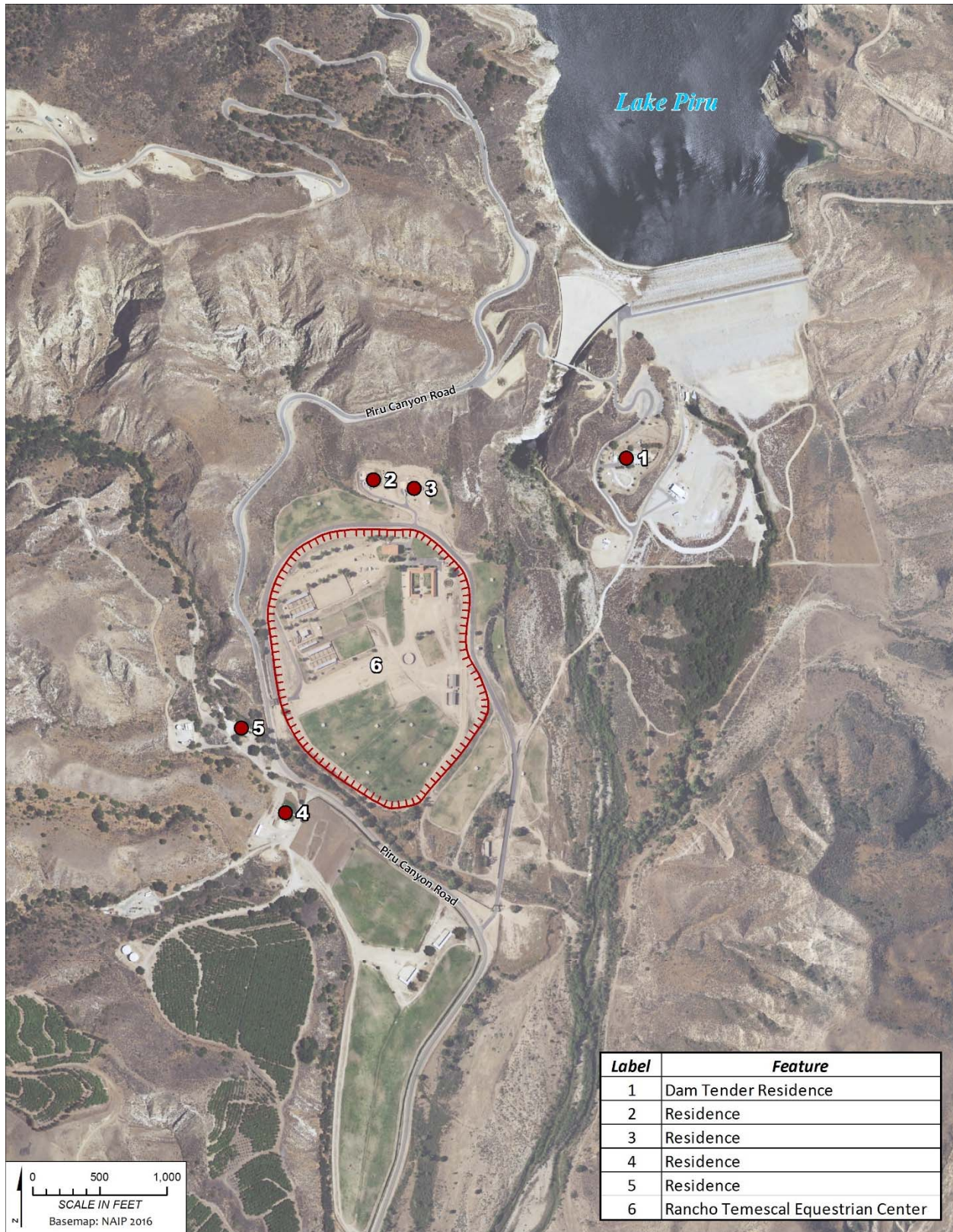


Figure 5.13-2 Sensitive Receptors in Project Vicinity

5.13.2 Regulatory Framework

Federal, State, and local noise regulations and policies that may apply to the Project are described below.

5.13.2.1 *Federal*

5.13.2.1.1 Noise Control Act of 1972

USEPA, pursuant to the Noise Control Act of 1972, established guidelines for acceptable noise levels for sensitive receivers such as residential areas, schools, and hospitals. The levels set forth are 55 dBA L_{dn} for outdoor use areas and 45 dBA L_{dn} for indoor use areas, and a maximum level of 70 dBA L_{dn} is identified for all areas to prevent hearing loss (USEPA 1974). These levels provide guidance for local jurisdictions, but do not have regulatory enforceability. In the absence of applicable noise limits, the USEPA levels can be used to assess the acceptability of project-related noise.

5.13.2.1.2 U.S. Department of Housing and Urban Development

The U.S. Department of Housing and Urban Development (HUD) has also established guidelines for acceptable noise levels for sensitive receivers such as residential areas, schools, and hospitals (24 CFR 51). HUD's noise levels include a two-pronged guidance, one for the desirable noise level and the other for the maximum acceptable noise level. The desirable noise level established by HUD conforms to the USEPA guidance of 55 dBA L_{dn} for outdoor use areas of residential land uses and 45 dBA L_{dn} for indoor areas of residential land uses. The secondary HUD standard establishes a maximum acceptable noise level of 65 dBA L_{dn} for outdoor use areas of residential areas.

5.13.2.1.3 Federal Transit Authority

The FTA has published guidance relevant to assessing vibration impacts (FTA 2006). As an example from the guidance, engineered concrete and masonry (no plaster) buildings can be exposed to ground-borne vibration levels of 0.3 in/sec without experiencing structural damage. Buildings extremely susceptible to vibration damage (e.g., historic buildings) can be exposed to ground-borne vibration levels of 0.12 in/sec without experiencing structural damage. The majority of buildings surrounding the Project site consist of engineered concrete and masonry buildings, steel framed buildings, and stucco and wood frame residences.

5.13.2.2 *State*

The California Code of Regulations has guidelines for evaluating the compatibility of various land uses as a function of community noise exposure, as shown in Table 5.13-5 below.

The extensive State regulations pertaining to worker noise exposure are applicable to the construction phase of the proposed Project (for example California Occupational Safety and Health Administration Occupational Noise Exposure Regulations [8 CCR General Industrial Safety Orders, Article 105, Control of Noise Exposure, Section 5095, et seq.]), for workers in a "central plant" and/or maintenance facility, or for those involved in the use of maintenance equipment or heavy machinery.

Table 5.13-5 Land Use Compatibility for Community Noise Environments

Land Use Category	Community Noise Exposure L _{dn} or CNEL, dBA					
	55	60	65	70	75	80
Residential: Low-density Single Family, Duplex, Mobile Homes						
Residential: Multiple Family						
Transient Lodging: Motels, Hotels						
Schools, Libraries, Churches, Hospitals, Nursing Homes						
Auditoriums, Concert Halls, Amphitheatres						
Sports Arena, Outdoor Spectator Sports						
Playgrounds, Neighbourhood Parks						
Golf Courses, Riding Stables, Water Recreation, Cemeteries						
Office Buildings, Business Commercial and Professional						
Industrial, Manufacturing, Utilities, Agriculture						
INTERPRETATION						
	<u>Normally Acceptable</u> : specified land use is satisfactory, based upon the assumption that any buildings involved are of normal construction without any special noise insulation requirements.					
	<u>Conditionally Acceptable</u> : New construction or development should only be undertaken after a detailed analysis of the noise reduction requirements is made and the needed insulation features included in the design.					
	<u>Normally Unacceptable</u> : New construction or development should generally be discouraged. If new development is to proceed, a detailed analysis of the noise reduction requirements is made and the needed insulation features included in the design.					
	<u>Clearly Unacceptable</u> : New development or construction should not be undertaken.					

Source: California Office of Planning and Research 2003

5.13.2.3 Local

Although Santa Felicia Dam is located in unincorporated Ventura County, it is exempt from local permit requirements because it is a water storage and power generation facility and regulated by a license issued by FERC under the Federal Powers Act. Therefore, the Project is not subject to the provisions of the Ventura County General Plan, which presents goals and objectives to eliminate or avoid adverse noise impacts in the unincorporated County areas. Relevant goals from the Ventura County General Plan are presented for informational purposes only.

5.13.2.3.1 Ventura County General Plan

The goal of the Ventura County General Plan Noise Element is to protect the health, safety, and general welfare of Ventura County residents by eliminating or avoiding adverse noise impacts on existing and future noise-sensitive uses (Ventura County 2016). To accomplish this goal, the General Plan establishes a set of community noise abatement policies such as noise compatibility criteria for discretionary developments involving noise exposure or generation in excess of established standards. For controlling sources proposed to be located near any noise-sensitive use, this policy establishes the following maximum allowable one-hour average noise levels (L_{eq}):

- > 55 dBA (or ambient noise level plus 3 dBA, whichever is greater) from 6:00 a.m. to 7:00 p.m. on weekdays;
- > 50 dBA (or ambient noise level plus 3 dBA, whichever is greater) from 7:00 p.m. to 10:00 p.m.; and
- > 45 dBA (or ambient noise level plus 3 dBA, whichever is greater) from 10:00 p.m. to 6:00 a.m.

Noise control measures required by the Noise Element need to address the following priorities:

- > Reduction of noise emissions at the source;
- > Attenuation of sound transmission along its path, using barriers, landforms modification, dense plantings, and the like; and
- > Rejection of noise at the reception point via noise control building construction, hearing protection or other means.

5.13.2.3.2 Ventura County Construction Noise Threshold Criteria and Control Plan

To address specific construction noise limits for noise-sensitive locations not currently addressed in the Ventura County General Plan or Ordinance Code, Ventura County has developed noise thresholds and standard noise monitoring and control measures for construction activities within the County's jurisdiction (Ventura County 2010b). These thresholds are summarized in Table 5.13-6 and Table 5.13-7.

Table 5.13-6 Ventura County Daytime Construction Noise Threshold Criteria¹

Construction Duration Affecting Noise-Sensitive Receptors	Fixed L_{eq} (dBA)	Hourly Equivalent Noise Level (L_{eq}) (dBA) ^{2, 3}
0 to 3 days	75	Ambient $L_{eq}(h)$ + 3dB
4 to 7 days	70	Ambient $L_{eq}(h)$ + 3dB
1 to 2 weeks	65	Ambient $L_{eq}(h)$ + 3dB
2 to 8 weeks	60	Ambient $L_{eq}(h)$ + 3dB
Longer than 8 weeks	55	Ambient $L_{eq}(h)$ + 3dB

Construction Duration Affecting Noise-Sensitive Receptors	Fixed L_{eq} (dBA)	Hourly Equivalent Noise Level (L_{eq}) (dBA) ^{2, 3}
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Source: Ventura County 2010b

Notes:

- (1) Daytime noise threshold criteria shall be the greater of these noise levels at the nearest receptor area or 10 feet from the nearest noise-sensitive building.
- (2) The instantaneous maximum sound level shall not exceed the threshold by 20 dBA more than 8 times per daytime hour.
- (3) Local ambient L_{eq} measurements are required by Ventura County to be made on any mid-week day prior to project work.

Table 5.13-7 Ventura County Evening and Night Construction Noise Threshold Criteria¹

Receptor Location	Fixed L_{eq} (dBA)	Hourly Equivalent Noise Level (L_{eq}) (dBA) ^{2, 3}
Residential	50 (evening)	Ambient $L_{eq}(h)$ + 3dB
Residential	45 (night)	Ambient $L_{eq}(h)$ + 3dB

Source: Ventura County 2010b

Notes:

- (1) Evening and night noise threshold criteria shall be the greater of these noise levels at the nearest receptor area or 10 feet from the nearest noise-sensitive building.
- (2) The instantaneous maximum sound level shall not exceed the threshold by 20 dBA more than 8 times per daytime hour.
- (3) Local ambient L_{eq} measurements are required by Ventura County to be made on any mid-week evening, and night prior to project work.

5.13.3 Impacts and Mitigation Measures

5.13.3.1 **Significance Criteria**

UWCD reviewed Appendix G of the CEQA Guidelines to determine whether the Project would result in significant impacts related to noise. The criteria listed below consider if the Project would:

- a. Expose persons to, or generate, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- b. Expose people to, or generate, excessive vibration or ground-borne noise levels.
- c. Cause a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project.
- d. Cause a substantial permanent increase in ambient noise levels in the Project vicinity above noise levels existing without the Project.
- e. For a project located with an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels.
- f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

The noise thresholds identified in the Ventura County Construction Noise Threshold Criteria and Control Plan are used in the determination of significance for noise impacts during construction. Criteria a, b, c are relevant to the construction phase of the Project and are discussed in Section 5.13.3.2. Criterion d is not discussed further because the new hydroelectric plant would be comparable to the existing facility and would not result in an increase in noise from that generated at the existing Powerhouse and outlet works, no additional noise-generating equipment would be permanently added, nor would operations or

maintenance practices result in a substantial permanent change in ambient noise levels; thus, no permanent changes in the noise environment would result from the Project. Criteria e and f also are not discussed further because the Project is not located within an airport land use plan, within two miles of a public airport or public use airport, or in the vicinity of a private airstrip.

5.13.3.2 Proposed Project

Impact NOISE-1: The Project would expose persons to, or generate, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies (Construction - Significant and Unavoidable, Operation – No Impact).

Construction

The proposed Project would involve the demolition of the existing facilities, construction of a modified spillway and a new outlet works system, realignment of access roadways, and construction of a new bridge. Construction would generate noise as a result of grading, excavation, blasting, and truck trips hauling materials to the Project site and construction at the Project site. Noise-sensitive receptors in the town of Piru could be exposed to increased noise levels associated with an increase in truck trips as discussed in Section 5.17, Transportation and Traffic. The dam is located in a generally undeveloped area, but the adjacent Rancho Temescal and nearby isolated residences could be exposed to temporarily increased noise levels during construction.

During construction, noise would be generated from the use of construction equipment and from vehicles used to transport crews, equipment, and materials to the Project area. Noise levels for typical construction equipment listed in the project description at various distances from the equipment have been calculated previously and published in various reference documents. Typical expected equipment noise levels listed in the FHWA Roadway Construction Noise Model User's Guide (FHWA 2006) were used for this evaluation. The User's Guide provides the most recent comprehensive assessment of noise levels from construction equipment. Table 5.13-8 summarizes typical usage factors, and maximum noise levels, for various representative types of construction equipment expected to be used.

Table 5.13-8 Typical Construction Noise Levels

Equipment Description	Acoustical Usage Factor (%)	Specified L _{max} at 50 feet (dBA)
All Other Equipment > 5 horsepower	50	85
Excavator	40	85
Pickup Trucks	40	55
Backhoe	40	80
Bobcat with Attached Saw-Cutter	20	90
Hydraulic Hoe Ram	20	90
Pipe Jack Operations	25	80
Tunnelling Operations	50	80

Source: FHWA Roadway Construction Noise Model User's Guide (FHWA 2006)

As shown in Table 5.13-8, the loudest typical construction equipment generally emits noise in the range of 80 to 90 dBA at 50 feet, with usage factors of up to 40 percent and 50 percent. Noise at any specific receptor is dominated by the closest and loudest equipment. The types and numbers of construction equipment near any specific receptor location would vary over time. Spillway and outlet works system construction would generate the most noise at the nearest sensitive receptors during activities involving, but not limited to, saw-cutting, tunneling, blasting, and pipe jacking operations. In general, equipment was assumed to operate simultaneously at the construction area nearest to potentially affected residential receptors (approximately 1,500 feet from construction activities). These assumptions represent a worst-

case scenario as the various activities would typically be dispersed throughout the site and not operate continuously at one, close-by location. Tables 5.13-9 and 5.13-10 list equipment noise source data and the quantity of equipment to be used during the construction of the outlet works system with a sloping intake structure option and intake tower option, respectively. Tables 5.13-11 and 5.13-12 list equipment noise source data and the quantity of equipment to be used during the construction of the spillway widening option and spillway deepening option, respectively.

Table 5.13-9 Outlet Works Construction Equipment, Sloping Intake Option

Project Activity	Equipment	Quantity	Daytime Operating Hours	Typical Equipment L _{max} (dBA) at 50 feet from Source ¹
Mobilization	Chipper, Beaver M12 R	1	4	89
	Dozer - D8	1	4	85
	Flatbed Truck	1	8	84
	Fork Loader, Cat 926K	1	8	79
	Motor Grader - Cat 140K	1	4	83
	Mini-Excavator, John Deer 85G	1	4	81
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Daily Semi Trailer Truck	1	4	88
	Daily Tandem Trailer Truck	1	4	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	10	0.5	68
Access Roads and Pads	Chipper, Beaver M12 R	1	8	89
	Compactor, Sheepsfoot - Cat 825H	1	4	83
	Compactor - Sheepsfoot - Cat 815F2	1	4	83
	Dozer - Cat D10, w/ripper attachment	1	8	85
	Dozer - D8	1	8	85
	Dump Truck - 10 CY	1	8	84
	Loader - Cat 966K	1	8	81
	Motor Grader - Cat 140K	1	8	83
	Mini-Excavator, John Deer 85G	1	4	81
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Daily Semi Trailer Truck	1	4	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	12	0.5	68
Intake Facility Excavation	Shotcrete Pump and Sprayer	1	8	87
	Manlift, 1532 EX	1	8	75
	Hand Drills	1	4	92

Table 5.13-9 Outlet Works Construction Equipment, Sloping Intake Option

Project Activity	Equipment	Quantity	Daytime Operating Hours	Typical Equipment L_{max} (dBA) at 50 feet from Source¹
	Crane - 35 ton	1	4	83
	Dozer - D10, w/ripper attachment	1	8	85
	Dump Truck - 10 CY	2	8	84
	Excavator - Cat 329	1	8	81
	Loader Cat 966	1	8	81
	Water Truck, 2500 Gal	1	8	76
	Generator	2	8	81
	Daily Concrete Mixer Truck	1	8	85
	Daily Semi Trailer Truck	1	4	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	12	0.5	68
Tunnel Excavation	Shotcrete Pump and Sprayer	1	8	87
	Manlift, 1532 EX	1	4	75
	Hand Drills	1	4	92
	Dump Truck - 10 CY	1	8	84
	Loader Cat 966	1	8	81
	Mini-Excavator, John Deere 85G	1	8	81
	Drilling Machine/Jumbo	1	8	90
	Road Header	1	8	85
	Tunnel Mucker/Loader	1	8	75
	Conveyor	1	8	73
	Ventilation System	1	8	67
	Pickup Trucks, Ford F-150	2	8	75
	Generator	1	8	81
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
Personal Vehicles, Light Duty Truck	12	0.5	68	
Tunnel Pipe Install	Concrete Pump, Truck, Schwing 900	1	6	82
	Fork Loader	1	4	79
	Welder & Generator Set	2	8	74
	Pipe Carrier	1	4	82
	Ventilation System	1	8	67
	Pickup Trucks, Ford F-150	2	8	75
	Generator	1	8	81

Table 5.13-9 Outlet Works Construction Equipment, Sloping Intake Option

Project Activity	Equipment	Quantity	Daytime Operating Hours	Typical Equipment L _{max} (dBA) at 50 feet from Source ¹
	Daily Concrete Mixer Truck - 8 CY	1	4	85
	Daily Semi Trailer Truck	1	2	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	10	0.5	68
Inclined Intake Facility Components	Compactor - Sheepsfoot - Cat 815F2	1	8	83
	Compressor, Husky 20 Gal	1	8	81
	Concrete Pump, Truck, Schwing 900	1	8	82
	Manlift, 1532 EX	1	4	75
	Hand Drills	1	4	92
	Crane - 35 ton	1	4	83
	Flatbed Truck	1	8	84
	Fork Loader	1	4	79
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Generator	1	8	81
	Daily Concrete Mixer Truck - 8 CY	1	4	85
	Daily Semi Trailer Truck	1	4	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
Personal Vehicles, Light Duty Truck	12	0.5	68	
Downstream Facility Excavation	Dump Truck - 10 CY	1	8	84
	Mini-Excavator, John Deere 85G	1	8	81
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	6	0.5	68
Downstream Facility Components	Compactor - Sheepsfoot - Cat 815F2	1	8	83
	Compressor, Husky 20 Gal	1	8	81
	Concrete Pump, Truck, Schwing 900	1	4	82
	Crane - 35 ton	1	4	83
	Flatbed Truck	1	8	84
	Fork Loader	1	8	79
	Water Truck, 2500 Gal	1	8	76
	Welder & Generator Set	1	4	74

Table 5.13-9 Outlet Works Construction Equipment, Sloping Intake Option

Project Activity	Equipment	Quantity	Daytime Operating Hours	Typical Equipment L _{max} (dBA) at 50 feet from Source ¹
	Pickup Trucks, Ford F-150	2	8	75
	Generator	1	8	81
	Asphalt Paver, Cat AP500F	1	8	89
	Roller, Cat CB24B	1	8	74
	Daily Concrete Mixer Truck - 8 CY	1	4	85
	Daily Semi Trailer Truck	1	4	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	12	0.5	68
Remove Intake Facility Cofferdam	Excavator - Cat 329	1	8	81
	Pickup Trucks, Ford F-150	1	8	75
	Barge and Skiff	1	8	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	4	0.5	68
Abandon Existing Outlet Works	Concrete Pump, Truck, Schwing 900	1	4	82
	Dump Truck - 10 CY	1	8	84
	Flatbed Truck	1	8	84
	Loader Cat 966	1	8	81
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Daily Concrete Mixer Truck - 8 CY	1	4	85
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	10	0.5	68
Demobilization /Reclamation	Dump Truck - 10 CY	1	8	84
	Flatbed Truck	1	8	84
	Fork Loader	1	8	79
	Mini-Excavator, John Deere 85G	1	8	81
	Water Truck, 2500 Gal	1	8	76
	Hydroseeding Machine	1	8	74
	Pickup Trucks, Ford F-150	2	8	75
	Asphalt Paver, Cat AP500F	1	8	89
	Roller, Cat CB24B	1	8	74
	Daily Semi Trailer Truck	1	8	88
Daily Tandem Trailer Truck	1	8	88	

Table 5.13-9 Outlet Works Construction Equipment, Sloping Intake Option

Project Activity	Equipment	Quantity	Daytime Operating Hours	Typical Equipment L _{max} (dBA) at 50 feet from Source ¹
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	12	0.5	68

Note:

(1) Noise levels derived from FHWA Construction Noise Handbook (FHWA 2006)

Table 5.13-10 Outlet Works Construction Equipment, Intake Tower Option

Project Activity	Equipment	Quantity	Daytime Operating Hours	Typical Equipment L _{max} (dBA) at 50 feet from Source ¹
Mobilization	Chipper, Beaver M12 R	1	4	89
	Dozer - D8	1	4	85
	Flatbed Truck	1	8	84
	Fork Loader, Cat 926K	1	8	79
	Motor Grader - Cat 140K	1	4	83
	Mini-Excavator, John Deer 85G	1	4	81
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Daily Semi Trailer Truck	1	4	88
	Daily Tandem Trailer Truck	1	4	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	10	0.5	68
Access Roads and Pads	Chipper, Beaver M12 R	1	8	89
	Compactor, Sheepsfoot - Cat 825H	1	4	83
	Compactor - Sheepsfoot - Cat 815F2	1	4	83
	Dozer - Cat D10, w/ripper attachment	1	8	85
	Dozer - D8	1	8	85
	Dump Truck - 10 CY	1	8	84
	Loader - Cat 966K	1	8	81
	Motor Grader - Cat 140K	1	8	83
	Mini-Excavator, John Deer 85G	1	4	81
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Daily Semi Trailer Truck	1	4	88

Table 5.13-10 Outlet Works Construction Equipment, Intake Tower Option

Project Activity	Equipment	Quantity	Daytime Operating Hours	Typical Equipment L _{max} (dBA) at 50 feet from Source ¹
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	12	0.5	68
Intake Facility Excavation	Shotcrete Pump and Sprayer	1	8	87
	Manlift, 1532 EX	1	8	75
	Barge and Skiff	1	8	88
	Crane - 35 ton	1	4	83
	Dozer - D10, w/ripper attachment	1	8	85
	Dump Truck - 10 CY	2	8	84
	Excavator - Cat 329	1	8	81
	Loader Cat 966	1	8	81
	Water Truck, 2500 Gal	1	8	76
	Generator	2	8	81
	Daily Concrete Mixer Truck	1	8	85
	Daily Semi Trailer Truck	1	4	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	12	0.5	68
Tunnel Excavation	Shotcrete Pump and Sprayer	1	8	87
	Manlift, 1532 EX	1	4	75
	Dump Truck - 10 CY	1	8	84
	Loader Cat 966	1	8	81
	Mini-Excavator, John Deere 85G	1	8	81
	Drilling Machine/Jumbo	1	8	90
	Road Header	1	8	85
	Tunnel Mucker/Loader	1	8	75
	Conveyor	1	8	73
	Ventilation System	1	8	67
	Pickup Trucks, Ford F-150	2	8	75
	Generator	1	8	81
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	12	0.5	68
Tunnel Pipe Install	Concrete Pump, Truck, Schwing 900	1	6	82
	Fork Loader	1	4	79
	Welder & Generator Set	2	8	74

Table 5.13-10 Outlet Works Construction Equipment, Intake Tower Option

Project Activity	Equipment	Quantity	Daytime Operating Hours	Typical Equipment L _{max} (dBA) at 50 feet from Source ¹
	Pipe Carrier	1	4	82
	Ventilation System	1	8	67
	Pickup Trucks, Ford F-150	2	8	75
	Generator	1	8	81
	Daily Concrete Mixer Truck - 8 CY	1	4	85
	Daily Semi Trailer Truck	1	2	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	10	0.5	68
Intake Tower and Ancillary Facilities	Compactor - Sheepsfoot - Cat 815F2	1	8	83
	Compressor, Husky 20 Gal	1	8	81
	Concrete Pump, Truck, Schwing 900	1	8	82
	Manlift, 1532 EX	1	4	75
	Crane - 35 ton	1	4	83
	Flatbed Truck	1	8	84
	Fork Loader	1	4	79
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Generator	1	8	81
	Daily Concrete Mixer Truck - 8 CY	1	4	85
	Daily Semi Trailer Truck	1	4	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
Personal Vehicles, Light Duty Truck	12	0.5	68	
Downstream Facility Excavation	Dump Truck - 10 CY	1	8	84
	Mini-Excavator, John Deere 85G	1	8	81
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	6	0.5	68
Downstream Facility Components	Compactor - Sheepsfoot - Cat 815F2	1	8	83
	Compressor, Husky 20 Gal	1	8	81
	Concrete Pump, Truck, Schwing 900	1	4	82
	Crane - 35 ton	1	4	83
	Flatbed Truck	1	8	84

Table 5.13-10 Outlet Works Construction Equipment, Intake Tower Option

Project Activity	Equipment	Quantity	Daytime Operating Hours	Typical Equipment L _{max} (dBA) at 50 feet from Source ¹
	Fork Loader	1	8	79
	Water Truck, 2500 Gal	1	8	76
	Welder & Generator Set	1	4	74
	Pickup Trucks, Ford F-150	2	8	75
	Generator	1	8	81
	Asphalt Paver, Cat AP500F	1	8	89
	Roller, Cat CB24B	1	8	74
	Daily Concrete Mixer Truck - 8 CY	1	4	85
	Daily Semi Trailer Truck	1	4	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	12	0.5	68
Remove Intake Facility Cofferdam	Excavator - Cat 329	1	8	81
	Pickup Trucks, Ford F-150	1	8	75
	Barge and Skiff	1	8	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	4	0.5	68
Abandon Existing Outlet Works	Concrete Pump, Truck, Schwing 900	1	4	82
	Dump Truck - 10 CY	1	8	84
	Flatbed Truck	1	8	84
	Loader Cat 966	1	8	81
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Daily Concrete Mixer Truck - 8 CY	1	4	85
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	10	0.5	68
Demobilization/ Reclamation	Dump Truck - 10 CY	1	8	84
	Flatbed Truck	1	8	84
	Fork Loader	1	8	79
	Mini-Excavator, John Deere 85G	1	8	81
	Water Truck, 2500 Gal	1	8	76
	Hydroseeding Machine	1	8	74
	Pickup Trucks, Ford F-150	2	8	75
	Asphalt Paver, Cat AP500F	1	8	89

Table 5.13-10 Outlet Works Construction Equipment, Intake Tower Option

Project Activity	Equipment	Quantity	Daytime Operating Hours	Typical Equipment L_{max} (dBA) at 50 feet from Source¹
	Roller, Cat CB24B	1	8	74
	Daily Semi Trailer Truck	1	8	88
	Daily Tandem Trailer Truck	1	8	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	12	0.5	68

Note:

- (1) Noise levels derived from FHWA Construction Noise Handbook (FHWA 2006)

Table 5.13-11 Spillway Widening Construction Equipment

Project Activity	Equipment	Quantity	Operating Hours per Day	Typical Equipment L _{max} (dBA) at 50 feet from Source ¹
Mobilization	Chipper, Beaver M12 R	1	4	89
	Dozer - D8	1	4	85
	Dump Truck - 10 CY	1	4	84
	Flatbed Truck	1	8	84
	Fork Loader, Cat 926K	1	8	79
	Loader - Cat 966K	1	8	81
	Motor Grader - Cat 140K	1	4	83
	Mini-Excavator, John Deer 85G	1	4	81
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Daily Semi Trailer Truck	1	8	88
	Daily Tandem Trailer Truck	1	8	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	10	0.5	68
Access Road Realignment	Chipper, Beaver M12 R	1	4	89
	Shotcrete Pump and Sprayer	1	8	87
	Compactor, Sheepsfoot - Cat 825H	1	4	83
	Compactor - Sheepsfoot - Cat 815F2	1	4	83
	Dozer - Cat D10, w/ripper attachment	1	4	85
	Dozer - D8	1	4	85
	Dump Truck - 10 CY	1	8	84
	Loader - Cat 966K	1	8	81
	Motor Grader - Cat 140K	1	8	83
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Excavator - Cat AP500F	1	8	81
	Daily Concrete Mixer Truck - 8 CY	1	8	85
	Daily Semi Trailer Truck	1	8	88
	Daily Tandem Truck	1	8	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	12	0.5	68
	Crane - 35 ton	1	8	83

Table 5.13-11 Spillway Widening Construction Equipment

Project Activity	Equipment	Quantity	Operating Hours per Day	Typical Equipment L_{max} (dBA) at 50 feet from Source¹
Selective Site Demolition	Dozer - D10, w/ripper attachment	1	8	85
	Dump Truck - 10 CY	2	8	84
	Flatbed Truck	1	8	84
	Loader - Cat 966K	1	8	81
	Mini-Excavator, John Deere 85G	1	8	81
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Excavator - Cat 336EL	1	8	81
	Daily Semi Trailer Truck	1	4	88
	Daily Tandem Trailer Truck	1	4	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	14	0.5	68
Excavation for Chute Widening	Manlift, 1532 EX	1	4	75
	Hand Drills	1	4	92
	Crane - 35 ton	1	4	83
	Dozer - D8	1	8	85
	Dump Truck - 10 CY	4	8	84
	Loader - Cat 966K	1	8	81
	Mini-Excavator, John Deere 85G	1	4	81
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Excavator - Cat 336EL	2	8	81
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	14	0.5	68
Training Walls and Chute Lining	Concrete Pump, Truck, Schwing 900	1	4	82
	Crane - 35 ton	1	8	83
	Fork Loader Cat 926K	1	8	79
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Daily Concrete Mixer Truck - 8 CY	1	4	85
	Daily Semi Trailer Truck	1	4	88
	Daily Tandem Trailer Truck	1	4	88

Table 5.13-11 Spillway Widening Construction Equipment

Project Activity	Equipment	Quantity	Operating Hours per Day	Typical Equipment L _{max} (dBA) at 50 feet from Source ¹
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	12	0.5	68
MSE Wall Dam Raise	Compactor - Sheepsfoot - Cat 815F2	1	8	83
	Compactor - Walking, WEN 56035	2	8	83
	Compactor - Whacker, Wacker BS50	2	8	83
	Compactor - Roller, Mikasa MRH800GS	1	8	83
	Dozer - D8	1	8	85
	Loader - Cat 966K	1	8	81
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Asphalt Paver, Cat AP500F	1	8	89
	Roller, Cat CB24B	1	8	74
	Daily Semi Trailer Truck	1	2	88
	Daily Tandem Trailer Truck	1	2	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	14	0.5	68
Bridge Pier and Abutment	Concrete Pump, Truck, Schwing 900	1	4	82
	Crane - 35 ton	1	8	83
	Flatbed Truck	1	8	84
	Loader - Cat 966	1	8	81
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Asphalt Paver, Cat AP500F	1	8	89
	Roller, Cat CB24B	1	8	74
	Daily Concrete Mixer Truck - 8 CY	1	4	85
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	10	0.5	68
Access Bridge	Concrete Pump, Truck, Schwing 900	1	4	82
	Crane - 35 ton	1	8	83
	Flatbed Truck	1	8	84
	Fork Loader Cat 926K	1	8	79
	Water Truck, 2500 Gal	1	8	76

Table 5.13-11 Spillway Widening Construction Equipment

Project Activity	Equipment	Quantity	Operating Hours per Day	Typical Equipment L _{max} (dBA) at 50 feet from Source ¹
	Pickup Trucks, Ford F-150	2	8	75
	Excavator - Cat 336EL	1	8	81
	Asphalt Paver, Cat AP500F	1	8	89
	Roller, Cat CB24B	1	8	74
	Daily Concrete Mixer Truck - 8 CY	1	4	85
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	10	0.5	68
Demobilization/ Reclamation	Dump Truck - 10 CY	1	8	84
	Flatbed Truck	1	8	84
	Fork Loader Cat 926K	1	8	79
	Loader - Cat 966K	1	8	81
	Water Truck, 2500 Gal	1	8	76
	Hydroseeding Machine	1	4	74
	Straw Blower	1	4	89
	Pickup Trucks, Ford F-150	2	8	75
	Daily Semi Trailer Truck	1	8	88
	Daily Tandem Trailer Truck	1	8	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	10	0.5	68

Note:

(1) Noise levels derived from FHWA Construction Noise Handbook (FHWA 2006)

Table 5.13-12 Spillway Deepening Construction Equipment

Project Activity	Equipment	Quantity	Operating Hours per Day	Typical Equipment L _{max} (dBA) at 50 feet from Source ¹
Mobilization	Chipper, Beaver M12 R	1	4	89
	Dozer - D8	1	4	85
	Dump Truck - 10 CY	1	8	84
	Flatbed Truck	1	8	84
	Fork Loader, Cat 926K	1	8	79
	Motor Grader - Cat 140K	1	4	83

Table 5.13-12 Spillway Deepening Construction Equipment

Project Activity	Equipment	Quantity	Operating Hours per Day	Typical Equipment L_{max} (dBA) at 50 feet from Source¹
	Mini-Excavator, John Deere 85G	1	4	81
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Daily Semi Trailer Truck	1	8	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	10	0.5	68
Selective Site Demolition	Crane - 35 ton	1	8	83
	Dozer - D10, w/ripper attachment	1	8	85
	Dump Truck - 10 CY	2	8	84
	Flatbed Truck	1	8	84
	Loader - Cat 966K	1	8	81
	Mini-Excavator, John Deere 85G	1	8	81
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Excavator - Cat 336EL	1	8	81
	Daily Tandem Trailer Truck	1	4	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
Personal Vehicles, Light Duty Truck	14	0.5	68	
Excavation for Chute Deepening	Manlift, 1532 EX	1	4	75
	Hand Drills	1	4	92
	Dozer - D8	1	8	85
	Dump Truck - 10 CY	2	8	84
	Loader - Cat 966K	1	8	81
	Mini-Excavator, John Deere 85G	1	4	81
	Water Truck, 2500 Gal	1	4	76
	Pickup Trucks, Ford F-150	2	8	75
	Excavator - Cat 336EL	1	8	81
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	12	0.5	68
Rock Stabilization/	Manlift, 1532 EX	1	8	75
	Hand Drills	1	4	92
	Drill Rig	1	8	85

Table 5.13-12 Spillway Deepening Construction Equipment

Project Activity	Equipment	Quantity	Operating Hours per Day	Typical Equipment L_{max} (dBA) at 50 feet from Source¹
Permanent Facing	Flatbed Truck	1	8	84
	Loader - Cat 966K	1	8	81
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	12	0.5	68
Chute Lining	Compactor - Sheepsfoot - Cat 815F2	1	2	83
	Compactor - Walking, WEN 56035	1	4	83
	Compactor - Whacker, Wacker BS50	1	4	83
	Concrete Pump, Truck, Schwing 900	1	4	82
	Flatbed Truck	1	8	84
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Excavator – Cat 336EL	1	8	81
	Daily Concrete Mixer Truck - 8 CY	1	4	85
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	10	0.5	68
MSE Wall Dam Raise	Compactor - Sheepsfoot - Cat 815F2	1	8	83
	Compactor - Walking, WEN 56035	2	8	83
	Compactor - Whacker, Wacker BS50	2	8	83
	Compactor - Roller, Mikasa MRH800GS	1	8	83
	Dozer - D8	1	8	85
	Flatbed Truck	1	8	84
	Water Truck, 2500 Gal	1	8	76
	Pickup Trucks, Ford F-150	2	8	75
	Asphalt Paver, Cat AP500F	1	8	89
	Roller, Cat CB24B	1	8	74
	Daily Semi Trailer Truck	1	2	88
	Daily Tandem Trailer Truck	1	2	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	14	0.5	68
Demobilization/	Dump Truck - 10 CY	1	8	84

Table 5.13-12 Spillway Deepening Construction Equipment

Project Activity	Equipment	Quantity	Operating Hours per Day	Typical Equipment L _{max} (dBA) at 50 feet from Source ¹
Reclamation	Flatbed Truck	1	8	84
	Fork Loader Cat 926K	1	8	79
	Loader - Cat 966K	1	8	81
	Water Truck, 2500 Gal	1	8	76
	Hydroseeding Machine	1	4	74
	Straw Blower	1	4	89
	Pickup Trucks, Ford F-150	2	8	75
	Daily Semi Trailer Truck	1	8	88
	Daily Tandem Trailer Truck	1	8	88
	Supervision/Inspection Pickup Trucks, Ford F-150	6	8	75
	Personal Vehicles, Light Duty Truck	10	0.5	68

Note:

- (1) Noise levels derived from FHWA Construction Noise Handbook (FHWA 2006)

The Project would also include the installation of a 78-inch diameter steel conduit and an 24-inch diameter low-flow steel conduit to convey flows from the base of the intake structure to the downstream control facilities. The tunnel would be advanced using conventional “road header” and/or “drill and blast” methods, depending on the character of rock to be excavated. A road header is a piece of excavating equipment consisting of a boom-mounted cutting head mounted on a crawler. The cutting head operates at the rock face of the tunnel’s path. The drill and blast method would involve drilling a predetermined pattern of holes to a selected depth in the rock face of the tunnel’s path, filling the holes with explosives such as dynamite, and detonating the explosives causing the rock to crack and break apart. For both tunneling methods, the debris or spoil dislodged at the face would be hauled out of the tunnel. Other tools such as a pneumatic drill or hand tools would be used in smoothing out the surface of the rock, as needed.

Noise levels were determined based on the L_{eq} using the FTA’s construction noise methodology which is calculated from the L_{max} and the acoustical usage factor (the percentage of time that the equipment is typically in use over a given period of time) using the following equation (FTA 2006):

$$L_{eq} = L_{max} + 10 \log(U.F.) - 20 \log(D/50) - 10G \log(D/50)$$

where: L_{eq} is the L_{eq} at a receiver resulting from the operation of a single piece of equipment over a specified time period

L_{max} is the noise emission level of the particular piece of equipment at the reference distance of 50 feet

G is a constant that accounts for topography and ground effects

D is the distance from the receiver to the piece of equipment, and

U.F. is a usage factor that accounts for the fraction of time that the equipment is in use over the specified period.

The following are conservative assumptions that were used for the assessment of construction activities:

- > Free-field conditions are assumed and ground effects are assumed to be primarily over soft terrain. Consequently, $G = 0.55$.
- > Emission level at 50 feet, L_{max} , is derived from equipment noise levels presented by FHWA (2006).
- > Equipment is assumed to operate in a centralized area that acts as a point source of noise.

The cumulative noise for the equipment used during the noisiest phase of construction is propagated to the nearest sensitive receptor¹ to estimate the maximum noise impact resulting from proposed Project as summarized in Tables 5.13-13 and 5.13-14 for construction of the outlet works system sloping intake and intake tower options, respectively. Tables 5.13-15 and 5.13-16 summarize the maximum noise impact resulting from construction of the spillway widening and deepening options, respectively. These estimates assume a clear line of site to the receptor without any attenuation, although the actual environment includes the dam structure, sloped topography, and other natural and man-made barriers to noise between the noise source and the nearest sensitive receptors.

Table 5.13-13 Summary of Calculated Noise Levels and Impact Determinations at Surrounding Sensitive Receptors for Outlet Works Construction, Sloping Intake Option

Receiver Description	Approximate Distance and Direction from Nearest Noise Source*	Calculated Hourly (dBA L_{eq})	Above Daytime Significance Threshold? (55 dBA L_{eq})	Above Evening Significance Threshold? (50 dBA L_{eq})	Above Nighttime Significance Threshold? (48.8 dBA L_{eq})**
Mobilization Nearest Residence at Rancho Temescal	1,870 feet southwest	51.1	No	Yes	Yes
Access Roads and Pads Nearest Residence at Rancho Temescal	3,000 feet southwest	47.5	No	No	No
Intake Facility Excavation Nearest Residence at Rancho Temescal	3,000 feet southwest	49.2	No	No	Yes
Tunnel Excavation Nearest Residence at Rancho Temescal	2,550 feet southwest	50.2	No	Yes	Yes
Tunnel Pipe Install Nearest Residence at Rancho Temescal	2,550 feet southwest	44.7	No	No	No
Inclined Intake Facility Components Nearest Residence at Rancho Temescal	2,780 feet southwest	47.9	No	No	No
Downstream Facility Excavation Nearest Residence at Rancho Temescal	2,400 feet southwest	43.6	No	No	No

¹ For the purposes of this impact analysis, the dam tender is considered an employee of UWCD and the residence as part of the Project site. Accordingly, this residence is not being considered a sensitive receptor.

Receiver Description	Approximate Distance and Direction from Nearest Noise Source*	Calculated Hourly (dBA L_{eq})	Above Daytime Significance Threshold? (55 dBA L_{eq})	Above Evening Significance Threshold? (50 dBA L_{eq})	Above Nighttime Significance Threshold? (48.8 dBA L_{eq})**
Downstream Facility Components Nearest Residence at Rancho Temescal	2,400 feet southwest	49.5	No	No	Yes
Remove Intake Facility Cofferdam Nearest Residence at Rancho Temescal	2,780 feet southwest	43.7	No	No	No
Abandon Existing Outlet Works Nearest Residence at Rancho Temescal	1,690 feet southwest	49.9	No	No	Yes
Demobilization/Reclamation Nearest Residence at Rancho Temescal	1,870 feet southwest	53.1	No	Yes	Yes

* As measured from Staging Area 1.

** Equal to the measured ambient L_{eq} (45.8 dBA) plus 3 dB.

Table 5.13-14 Summary of Calculated Noise Levels and Impact Determinations at Surrounding Sensitive Receptors for Outlet Works Construction, Intake Tower Option

Receiver Description	Approximate Distance and Direction from Nearest Noise Source*	Calculated Hourly (dBA L_{eq})	Above Daytime Significance Threshold? (55 dBA L_{eq})	Above Evening Significance Threshold? (50 dBA L_{eq})	Above Nighttime Significance Threshold? (48.8 dBA L_{eq})**
Mobilization (Daytime Only) Nearest Residence at Rancho Temescal from Staging Area 1	1,870 feet southwest	51.1	No	Yes	Yes
Access Roads and Pads (Daytime Only) Nearest Residence at Rancho Temescal	3,000 feet southwest	47.5	No	No	No
Intake Facility Excavation (Daytime Only) Nearest Residence at Rancho Temescal	3,000 feet southwest	48.1	No	No	No
Tunnel Excavation Nearest Residence at Rancho Temescal	2,550 feet southwest	50.2	No	Yes	Yes
Tunnel Pipe Install Nearest Residence at Rancho Temescal	2,550 feet southwest	44.7	No	No	No

Receiver Description	Approximate Distance and Direction from Nearest Noise Source*	Calculated Hourly (dBA L_{eq})	Above Daytime Significance Threshold? (55 dBA L_{eq})	Above Evening Significance Threshold? (50 dBA L_{eq})	Above Nighttime Significance Threshold? (48.8 dBA L_{eq})**
Intake Tower and Ancillary Facilities Nearest Residence at Rancho Temescal	2,780 feet southwest	46.3	No	No	No
Downstream Facility Excavation Nearest Residence at Rancho Temescal	2,400 feet southwest	43.6	No	No	No
Downstream Facility Components Nearest Residence at Rancho Temescal	2,400 feet southwest	49.5	No	No	Yes
Remove Intake Facility Cofferdam Nearest Residence at Rancho Temescal	2,780 feet southwest	43.8	No	No	No
Abandon Existing Outlet Works Nearest Residence at Rancho Temescal	1,690 feet southwest	49.9	No	No	Yes
Demobilization/Reclamation Nearest Residence at Rancho Temescal	1,870 feet southwest	53.1	No	Yes	Yes

* As measured from Staging Area 1.

** Equal to the measured ambient L_{eq} (45.8 dBA) plus 3 dB.

Table 5.13-15 Summary of Calculated Noise Levels and Impact Determinations at Surrounding Sensitive Receptors for Construction of the Spillway Widening Option

Receiver Description	Approximate Distance and Direction from Nearest Noise Source*	Calculated Hourly (dBA L_{eq})	Above Daytime Significance Threshold? (55 dBA L_{eq})	Above Evening Significance Threshold? (50 dBA L_{eq})	Above Nighttime Significance Threshold? (48.8 dBA L_{eq})**
Mobilization Nearest Residence at Rancho Temescal from Staging Area 3	660 feet southwest	64.2	Yes	Yes	Yes
Access Road Realignment Nearest Residence at Rancho Temescal	660 feet southwest	65.3	Yes	Yes	Yes
Selective Site Demolition Nearest Residence at Rancho Temescal	1,120 feet southwest	59.7	Yes	Yes	Yes
Excavation for Chute Widening Nearest Residence at Rancho Temescal	1,090 feet southwest	58.8	Yes	Yes	Yes
Training Walls and Chute Lining Nearest Residence at Rancho Temescal	1,090 feet southwest	54.6	No	Yes	Yes
MSE Wall Dam Raise Components Nearest Residence at Rancho Temescal	1,630 feet southwest	54.5	No	Yes	Yes
Bridge Pier and Abutment Nearest Residence at Rancho Temescal	1,070 feet southwest	57.2	Yes	Yes	Yes
Access Bridge Nearest Residence at Rancho Temescal	1,070 feet southwest	57.3	No	Yes	Yes
Demobilization/Reclamation Nearest Residence at Rancho Temescal	660 feet southwest	63.9	Yes	Yes	Yes

* As measured from Staging Area 3.

** Equal to the measured ambient L_{eq} (45.8 dBA) plus 3 dB.

Table 5.13-16 Summary of Calculated Noise Levels and Impact Determinations at Surrounding Sensitive Receptors for Construction of the Spillway Deepening Option

Receiver Description	Approximate Distance and Direction from Nearest Noise Source*	Calculated Hourly (dBA L _{eq})	Above Daytime Significance Threshold? (55 dBA L _{eq})	Above Evening Significance Threshold? (50 dBA L _{eq})	Above Nighttime Significance Threshold? (48.8 dBA L _{eq})**
Mobilization Nearest Residence at Rancho Temescal from Staging Area 3	660 feet southwest	63.1	Yes	Yes	Yes
Selective Site Demolition Nearest Residence at Rancho Temescal	1,120 feet southwest	57.4	Yes	Yes	Yes
Excavation for Chute Deepening Nearest Residence at Rancho Temescal	1,060 feet southwest	57.9	Yes	Yes	Yes
Rock Stabilization/Permanent Facing Nearest Residence at Rancho Temescal	1,120 feet southwest	55.8	Yes	Yes	Yes
Chute Lining Nearest Residence at Rancho Temescal	1,060 feet southwest	54.6	No	Yes	Yes
MSE Wall Dam Raise Components Nearest Residence at Rancho Temescal	1,630 feet southwest	54.9	No	Yes	Yes
Demobilization/Reclamation Nearest Residence at Rancho Temescal	660 feet southwest	63.9	Yes	Yes	Yes

* As measured from Staging Area 3.

** Equal to the measured ambient L_{eq} (45.8 dBA) plus 3 dB.

The highest noise levels from construction activity would be associated with construction of spillway components for both the widening and deepening options, resulting in an estimated maximum hourly noise level at the nearest sensitive receptor (the residence at Rancho Temescal which is situated approximately 660 feet away) of 65.3 dBA for the widening option and 63.9 dBA for the deepening option. The estimated maximum noise levels during construction activities at the nearest sensitive receptor are above the daytime threshold of 55 dBA for construction projects longer than eight weeks as established by Ventura County Construction Noise Threshold Criteria and, therefore, would result in a significant and unavoidable impact even with incorporation with MM NOISE-1.

Estimated noise levels during the construction of the outlet works (except for blasting activities) do not exceed the 55 dBA daytime threshold for construction projects longer than eight weeks. In addition, while most of the work will be conducted during the daytime hours, the allowable work shift hours may extend into night shift work for specific tasks to improve productivity and shorten the schedule. If evening and nighttime work occurs, then several of the construction phases for both the outlet works and the spillway would exceed the applicable Ventura County Construction Noise Threshold Criteria of 50 dBA for evening hours and 48.8 dBA (Ambient L_{eq} + 3dB) for nighttime hours at the nearest sensitive receptor.

If blasting is used for construction of the tunnel, blasting activities would involve drilling a predetermined pattern of holes to a selected depth in the rock face of the tunnel's path, filling the holes with explosives such as dynamite, and detonating the explosives causing the rock to crack and break apart. When explosive charges detonate in rock, almost all of the available energy from the explosion is used in breaking and displacing the rock mass. However, some blast energy escapes into the atmosphere as a sequence of airborne sound waves, a phenomenon known as "air blast over-pressure." Exact blast charge weights and frequency are not known at this time, thus air-blast pressures cannot be predicted. However, it is assumed that blasting activities would cause high instantaneous noise levels. Typical noise levels from this type of blasting operation is 94 dB at 50 feet from the blast (FHWA 2006). Noise impacts resulting from the use of explosives are assumed to be significant and unavoidable. The duration of noise is very brief, lasting only a few seconds and is typically only performed during the daytime. By limiting the amount of explosives in each hole the blasting contractor can limit the fraction of total energy released at any single time, which can limit noise and vibration levels. Incorporation of measures outlined in MM NOISE-1 will also minimize impacts on sensitive receptors.

Construction of the outlet works would generate the most traffic on local roadways as described in Section 5.17, Transportation and Traffic. During construction of the outlet works, it is assumed that at most 37 delivery/haul truck trips and 84 construction worker vehicle trips would be generated traveling to and from the Project site daily. For an eight-hour construction workday, it is assumed that approximately five delivery/haul trucks per hour would be traveling on the surrounding streets. It is assumed that construction worker vehicles would be traveling on the roadways during the AM and PM peak hours. The construction worker vehicles would be distributed throughout the roadways within the vicinity of the project site. Generally, noise levels increase by 3 dBA when the number of similar noise sources double. When compared to the traffic volumes identified in Section 5.17, Transportation and Traffic, the increase in delivery/haul trucks and construction worker vehicle trips are not anticipated to double the amount of traffic that currently exist in the surrounding area. As such, the increase in delivery/haul trucks and worker vehicles in the surrounding roadways is not anticipated to incrementally increase noise levels in the surrounding area by 3 dBA or more.

Operation

The new hydroelectric plant would be comparable to the existing facility and would not result in a change in noise from existing conditions. The new intake will require daily inspections and periodic maintenance of the fish screens. Maintenance of fish screens will require that the screens are periodically raised, cleaned, repaired or replaced, and reinstalled. However, these actions will not result in a substantial change in noise generated from those generated during existing maintenance activities and would not substantially increase noise from existing conditions. As such, no noise impacts would occur during operations because noise generated during operations and maintenance would be unchanged from current conditions.

Mitigation Measures

MM NOISE-1: Noise Reduction and Control Practices. UWCD shall employ a combination of the following noise reduction and control practices to the extent feasible during construction of the proposed Project to ensure that the temporary increase in ambient noise will not exceed the maximum allowable levels identified by Ventura County, measured at the closest sensitive receptor property boundary.

- > Avoid nighttime construction, if possible. Otherwise, at a minimum, limit or avoid certain noisy activities during nighttime hours.
- > Where possible, minimize the use of impact devices, such as jackhammers, pavement breakers, and hoe rams and use alternative methods such as concrete crushers or pavement saws rather than hoe rams for tasks involving concrete or asphalt demolition and removal.

- > Pneumatic impact tools and equipment used at the construction site shall have intake and exhaust mufflers recommended by the manufacturers thereof, to meet relevant noise limitations.
- > Provide impact noise producing equipment, i.e. jackhammers and pavement breaker(s), with noise attenuating shields, shrouds or portable barriers or enclosures, to reduce operating noise.
- > Line or cover hoppers, conveyor transfer points, storage bins, and chutes with sound deadening material (e.g., apply wood or rubber liners to metal bin impact surfaces).
- > Provide upgraded mufflers, acoustical lining or acoustical paneling for other noisy equipment, including internal combustion engines.
- > Avoid blasting and impact-type pile driving when possible. If blasting methods are to be used, the blasting contractor shall limit the amount of explosives in each hole and blasting operations shall be limited to daytime operational hours and carried out at a similar time each day during afternoon hours as practicable.
- > Incorporation and use of noise-attenuating barriers and/or blankets to reduce noise levels where feasible.
- > Use alternative procedures of construction and select a combination of techniques that generate the least overall noise and vibration. Such alternative procedures could include the following:
 - o Use electric welders powered by remote generators (located as far as possible from sensitive noise receptors).
 - o Mix concrete at non-sensitive off-site locations, instead of on-site.
 - o Erect prefabricated structures instead of constructing buildings on-site.
- > Use construction equipment manufactured or modified to reduce noise and vibration emissions to the extent feasible, such as:
 - o Electric instead of diesel-powered equipment.
 - o Hydraulic tools instead of pneumatic tools.
 - o Electric saws instead of air- or gasoline-driven saws.
- > Turn off idling equipment when not in use for periods longer than 30 minutes.

Residual Impact

Implementation of MM NOISE-1 would reduce noise and annoyance when operations are within approximately 2,500 feet of a receptor during construction activities. However, even with implementation of noise reduction measures detailed in MM NOISE-1, there is a potential for Ventura County noise thresholds to be exceeded at sensitive receptors, and construction-related impacts under Impact Noise-1 would be significant and unavoidable, even with mitigation incorporated.

Impact NOISE-2: The Project would expose people to, or generate, excessive vibration or ground-borne noise levels (Construction - Less than Significant, Operation – No Impact).

Construction

Vibration levels from surface construction including blasting, tunneling, pipe jacking operations, demolition, pile driving, etc. are typically less than 0.10 to 0.20 in/sec at 10 feet from the source. Ground-borne vibration dissipates very rapidly with distance, reducing the typical construction-related vibrations to less than the threshold of 0.2 in/sec (PPV) for typical non-engineered timber and masonry buildings at a distance greater than 10 feet from the source and to an imperceptible level at about 200 feet from the source.

Construction would result in varying degrees of temporary ground vibration, depending on the specific construction equipment used and operations involved. Construction would result in additional heavy

vehicle trips on uneven roadways accessing the Project site. Rubber-tire heavy vehicles traveling on roadways typically will not produce a significant vibration impact, except in situations where a large number of heavy vehicles are traveling along uneven roadways within proximity to sensitive uses. However, perceptible ground-borne vibration generated by heavy vehicles on uneven roadways is typically limited to distances of up to 75 feet. Roadways providing access to the Project are located at a distance of more than 100 feet from any offsite residence or any other “high sensitivity use” as defined in the Transit Noise and Vibration Impact Assessment in the Ventura County Initial Study Assessment Guidelines (Ventura County 2010b).

Construction activities most likely to cause vibration include blasting, heavy construction equipment, and tunneling and pipe jacking operations. Although all heavy, mobile construction equipment has the potential to cause at least some perceptible vibration when operating close to buildings, the vibration is usually short term and is not of sufficient magnitude to cause building damage. It is not expected that heavy equipment such as excavators or trenching equipment would operate close enough to any residences to cause vibration impact. Blasting, tunneling, and pipe jacking equipment would be used for a relatively short period of time, and would be used approximately 2,550 feet from any offsite residence (Rancho Temescal). The Dam Tender’s residence, located onsite, is situated approximately 1,100 feet from blasting, tunneling and pipe jacking equipment and roughly 570 feet from spillway demolition activities. Although vibrations may be perceived for a short period, the potential risk of architectural or structural damage is not considered significant at the Dam Tender’s residence and would be less at Rancho Temescal. As such vibration and ground-borne noise level impacts would be less than significant during Project construction.

Operation

No noise impacts would occur during operations because operations and maintenance would be unchanged from current conditions.

Impact NOISE-3: The Project would cause a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project (Construction - Significant and Unavoidable, Operation – No Impact).

Construction

As discussed for Impact NOISE-1 above, construction would cause a substantial temporary increase in ambient noise levels at the Project site. The highest noise levels at the nearest sensitive receptors were calculated to be 65.3 dBA during realignment of the road associated with the widening of the spillway. For the spillway deepening option, the highest noise levels at the nearest sensitive receptor were calculated to be 63.9 dBA during demobilization and reclamation activities. Noise levels above the assumed ambient noise level of 55 dBA or an increase of 3 dBA or greater above actual ambient noise levels would be considered a significant impact in accordance with the thresholds established by the Ventura County Construction Noise Threshold Criteria. Also, as discussed further for Impact NOISE-1 above, construction of the outlet works would generate the most traffic on local roadways. When compared to the traffic volumes identified in Section 5.17, Transportation and Traffic, the increase in delivery/haul trucks and construction worker vehicle trips are not anticipated to double the amount of traffic that currently exists in the surrounding area. As such, the increase in delivery/haul trucks and worker vehicles in the surrounding roadways is not anticipated to incrementally increase noise levels in the surrounding area by 3 dBA or more.

Implementation of Mitigation Measure MM NOISE-1 is recommended to reduce noise and annoyance when operations are within approximately 0.5 mile (2,500) feet of a receptor during construction activities. However, even with implementation of noise reduction measures detailed in MM NOISE-1, there is a potential for Ventura County noise thresholds to be exceeded at sensitive receptors. As such, construction-related impacts are expected to be significant and unavoidable, even with mitigation incorporated.

Operation

No noise impacts would occur during operations because operations and maintenance would be unchanged from current conditions.

Mitigation Measures

MM NOISE-1: Noise Reduction and Control Practices. This mitigation measure is identified under Impact NOISE-1 and would be implemented for Impact NOISE-3.

Residual Impact

Implementation of MM NOISE-1 would reduce noise and annoyance when operations are within approximately 2,500 feet of a receptor during construction activities. However, even with implementation of noise reduction measures detailed in MM NOISE-1, there is a potential for Ventura County noise thresholds to be exceeded at sensitive receptors, and construction-related impacts under Impact NOISE-3 would be significant and unavoidable, even with mitigation incorporated.

5.13.3.3 Labyrinth Alternative

Under the Labyrinth Alternative the outlet works construction requirements, schedule, and noise levels would be comparable to those described for the proposed Project. However, under this alternative, noise levels at the nearest sensitive receptors would slightly differ from the noise predicted for the proposed Project during construction of the spillway components, with the highest noise levels estimated to be 65.1 dBA for the spillway widening option and 63.9 dBA for the spillway deepening option (see Tables 5.13-17 and 5.13-18, respectively). The predicted noise levels detailed in Table 5.13-17 and 5.13-18 are similar in magnitude to those calculated for the construction of the proposed Project. Accordingly, under this alternative, impacts to sensitive receptors would be the same as those described for the proposed Project.

Table 5.13-17 Summary of Calculated Noise Levels and Impact Determinations at Surrounding Sensitive Receptors for Construction of the Labyrinth Alternative, Spillway Widening Option

Receiver Description	Approximate Distance and Direction from Nearest Noise Source*	Calculated Hourly (dBA L _{eq})	Above Daytime Significance Threshold? (55 dBA L _{eq})	Above Evening Significance Threshold? (50 dBA L _{eq})	Above Nighttime Significance Threshold? (48.8 dBA L _{eq})**
Mobilization Nearest Residence at Rancho Temescal	660 feet southwest	64.2	Yes	Yes	Yes
Access Road Realignment Nearest Residence at Rancho Temescal	660 feet southwest	63.0	Yes	Yes	Yes
Selective Site Demolition Nearest Residence at Rancho Temescal	1,120 feet southwest	57.4	Yes	Yes	Yes
Excavation for Chute Widening Nearest Residence at Rancho Temescal	1,090 feet southwest	58.8	Yes	Yes	Yes
Training Walls and Chute Lining Nearest Residence at Rancho Temescal	1,090 feet southwest	55.1	Yes	Yes	Yes

Receiver Description	Approximate Distance and Direction from Nearest Noise Source*	Calculated Hourly (dBA L_{eq})	Above Daytime Significance Threshold? (55 dBA L_{eq})	Above Evening Significance Threshold? (50 dBA L_{eq})	Above Nighttime Significance Threshold? (48.8 dBA L_{eq})**
Labyrinth Weir Nearest Residence at Rancho Temescal	1,630 feet southwest	52.9	No	Yes	Yes
Bridge Pier and Abutment Nearest Residence at Rancho Temescal	1,070 feet southwest	57.1	Yes	Yes	Yes
Access Bridge Nearest Residence at Rancho Temescal	1,070 feet southwest	56.2	Yes	Yes	Yes
Demobilization/Reclamation Nearest Residence at Rancho Temescal	660 feet southwest	65.1	Yes	Yes	Yes

* Measured from Staging Area 3.

** Equal to the measured ambient L_{eq} (45.8 dBA) plus 3 dB.

Table 5.13-18 Summary of Calculated Noise Levels and Impact Determinations at Surrounding Sensitive Receptors for Construction of the Labyrinth Alternative, Spillway Deepening Option

Receiver Description	Approximate Distance and Direction from Nearest Noise Source*	Calculated Hourly (dBA L_{eq})	Above Daytime Significance Threshold? (55 dBA L_{eq})	Above Evening Significance Threshold? (50 dBA L_{eq})	Above Nighttime Significance Threshold? (48.8 dBA L_{eq})**
Mobilization Nearest Residence at Rancho Temescal	660 feet southwest	62.0	Yes	Yes	Yes
Selective Site Demolition Nearest Residence at Rancho Temescal	1,120 feet southwest	56.0	Yes	Yes	Yes
Excavation for Chute Deepening Nearest Residence at Rancho Temescal	1,060 feet southwest	58.0	Yes	Yes	Yes
Rock Stabilization/Permanent Facing Nearest Residence at Rancho Temescal	1,120 feet southwest	55.7	Yes	Yes	Yes
Chute Lining Nearest Residence at Rancho Temescal	1,060 feet southwest	55.6	Yes	Yes	Yes
Labyrinth Weir Nearest Residence at Rancho Temescal	1,630 feet southwest	53.0	No	Yes	Yes

Receiver Description	Approximate Distance and Direction from Nearest Noise Source*	Calculated Hourly (dBA L _{eq})	Above Daytime Significance Threshold? (55 dBA L _{eq})	Above Evening Significance Threshold? (50 dBA L _{eq})	Above Nighttime Significance Threshold? (48.8 dBA L _{eq})**
Demobilization/Reclamation Nearest Residence at Rancho Temescal	660 feet southwest	63.9	Yes	Yes	Yes

* Measured from Staging Area 3.

** Equal to the measured ambient L_{eq} (45.8 dBA) plus 3 dB.

5.13.3.4 No Project Alternative

Under the No Project Alternative, there would be no improvements to the outlet works system or spillway at Santa Felicia Dam. There would be no construction-related impacts and no change to the current operations and maintenance activities. Accordingly, there would be no noise-related impacts associated with this alternative.

5.14 Population and Housing

This section discusses the potential impacts on population and housing that could result from Project implementation. Table 5.14-1 summarizes the impacts on population and housing that would result from implementation of the Project or alternatives.

Table 5.14-1 Summary of Impacts on Population and Housing

Impact	Project	Labyrinth Alternative	No Project Alternative	Mitigation Measures
Impact PH-1: Project construction and operation would not displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.	Construction – O/ Operation – B	Construction – O/ Operation – B	Operation – O	None required.
Impact PH-2: Project construction and operation would not displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.	Construction – O/ Operation – B	Construction – O/ Operation – B	Operation – O	None required.
The Project would not induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure).	Construction – O/ Operation – O	Construction – O/ Operation – O	Operation – O	None required.

Note:

- O = No Impact
- L = Less than Significant Impact
- S = Significant Impact, but Mitigable to Less than Significant
- U = Significant Unavoidable Impact
- B = Beneficial Impact

5.14.1 Existing Conditions

The Project site is located in an unincorporated area of Ventura County, approximately 4.5 miles northeast of the town of Piru. Santa Felicia Dam and surrounding area are identified by the Ventura County General Plan as Open Space, as discussed in Section 5.11, Land Use (Figure 5.11-1). Apart from the Dam Tender's residence which houses a United employee, there are no permanent residences present in the area immediately surrounding the dam, primarily due to the special flood hazard zone present in the area and the open space designation in the General Plan. The nearest neighbor to the Project Site is Rancho Temescal, a thoroughbred horse farm with historic residences located immediately downstream of the dam, and adjacent to the United property boundary. The nearest other residences to the Project Site are located outside of the town of Piru along Piru Canyon Road.

Table 5.14-2 provides a breakdown of the housing units and the demographic profile of Piru and Ventura County, as well as the State of California, to provide a basis for comparison.

Table 5.14-2 Demographic Profile of Project Area and Housing Units

Area	Housing Units	Population	Demographic Profile (% of Total)						
			White	Black or African	American Indian and Alaskan Native	Asian	Native Hawaiian or Pacific Islander	Other Race	Two or More Races
Piru, CA	584	2,061	78.0%	0.0%	0.1%	0.2%	0.0%	15.6%	6.1%
Ventura County, CA	283,899	840,833	78.8%	1.8%	0.7%	7.1%	0.2%	7.2%	4.2%
State of California	13,845,790	38,421,464	61.8%	5.9%	0.7%	13.7%	0.4%	12.9%	4.5%

Source: U.S. Census Bureau, 2015 American Community Survey 5-year Estimates

5.14.2 Regulatory Framework

Population and housing is generally governed at the local (county and city) level through the implementation of General Plans and other land use planning documents.

5.14.2.1 Federal

There are no federal regulations that relate to population and housing and that apply to this Project.

5.14.2.2 State

There are no state regulations that relate to population and housing and that apply to this Project.

5.14.2.3 Local

Although Santa Felicia Dam is located in an unincorporated area of Ventura County, it is exempt from local permit requirements because it is a water storage and power generation facility and regulated by a license issued by FERC under the Federal Powers Act. Therefore, the Project is not subject to the provisions of the Ventura County General Plan. However, several policies are provided below for informational purposes only. The Piru Area Plan guides the distribution, general location, and land uses pertaining to housing, businesses, industry, open space, agriculture, and community facilities within the unincorporated area of Ventura County surrounding Piru. As described in Section 5.11, the Project area is located in an area designated as Open Space by Ventura County.

5.14.2.3.1 Ventura County General Plan

Policies

1. Housing developments should only occur in areas that are not within the 100-year floodplain, unless it can be shown through an engineering analysis that homes within areas threatened by the 100-year flood plain are protected (Ventura County 2011).
2. Urbanization is discouraged in areas that are designated as Agriculture or Open Space.

In addition to the Ventura County General Plan, the Save Open Space and Agricultural Resources (SOAR) Initiative was reinstated in 2016 with various edits to the original initiative of 1998 (Ventura County Planning Commission 2016.). SOAR is a series of voter initiatives that require a vote of the people before agricultural land or open space areas can be rezoned for development. The reinstatement

of the SOAR initiative limits the growth of population and housing in areas zoned as Open Space, including the Project area.

5.14.3 Impacts and Mitigation Measures

5.14.3.1 *Significance Criteria*

United reviewed Appendix G of the CEQA Guidelines to determine whether the Project would result in significant impacts related to population and housing. The criteria listed below consider if the Project would:

- a. Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure).
- b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.
- c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

Increasing spillway capacity at the existing Santa Felicia Dam as well as constructing a new outlet works system through the east abutment, new downstream control facilities and a new hydropower facility to replace the existing ones would not result in population growth either in the town of Piru or within greater Ventura County. While construction activities would require construction workers for a period of 48 months (the number of workers would vary depending on activity from 12 to up to 42 at any one time), the workforce would be hired from the region and would commute to/from the dam during the day and not require overnight accommodations. Following completion of construction activities, Santa Felicia Dam would continue to be operated in accordance with the FERC license for the hydroelectric project and would have no effect on population levels or housing downstream; therefore, criterion c is not discussed further.

5.14.3.2 *Proposed Project*

Impact PH-1: Project construction and operation would not displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere (Construction – no impact, Operation – beneficial impact).

Impact PH-2: Project construction and operation would not displace substantial numbers of people, necessitating the construction of replacement housing elsewhere (Construction – no impact, Operation – beneficial impact).

Construction

No homes or people would be displaced as a result of construction of the Project. Therefore, no impacts would occur as a result of construction.

Operation

The Project is designed to increase safety and decrease the risk of seismic failure and flooding downstream, which would result in a beneficial impact to the existing population by preventing the displacement of people and existing housing in the event of a natural disaster.

5.14.3.3 *Labyrinth Alternative*

The Labyrinth Alternative would result in the same impacts as described for the proposed Project. Although this alternative would implement a different configuration of the dam spillway, the overall Project area, construction footprint, and outlet works components would be the same, and the same number of construction workers and schedule would be required. The Labyrinth Alternative would thus also result in

a beneficial impact to the existing population by preventing displacement of people and existing housing in the event of a natural disaster.

5.14.3.4 No Project Alternative

Under the No Project Alternative, no improvements to Santa Felicia Dam, the existing spillway, or the existing outlet works system would be implemented. The conveyance capacity of the existing spillway would remain less than the established regulatory IDF, and the likelihood of failure under seismic loading conditions would remain for the existing outlet works. However, since no changes to the existing dam or Project area would occur under the No Project alternative, there would be no construction or operational impacts to housing or population.

5.15 Public Services

This section describes public services located in the vicinity of the Project site and discusses potential impacts associated with construction and operation of the Project components on public services, including fire and police protection services, schools, parks, and other public services. Table 5.15-1 summarizes the impacts on public services that would result from implementation of the Project or the alternatives.

Table 5.15-1 Summary of Impacts on Public Services

Impact	Project	Labyrinth Alternative	No Project Alternative	Mitigation Measures
Impact PUB-1: The Project could result in impacts to acceptable service ratios, response times or other performance objectives of police and fire protection services.	Construction – L/Operation - O	Construction – L/Operation - O	Operation - O	MM HZ-3: Develop fire control and emergency response plan; MM TRAN-2: Emergency vehicle access plan

Note:

- O = No Impact
- L = Less than Significant Impact
- S = Significant Impact, but Mitigable to Less than Significant
- U = Significant Unavoidable Impact
- B = Beneficial Impact

5.15.1 Existing Conditions

The Project area is located in an unincorporated area of Ventura County and is designated by the Ventura County General Plan as Open Space (Ventura County 2011). The nearest community is the town of Piru, located approximately 4.5 miles south of the Santa Felicia Dam. The public services that serve the Project area and town of Piru are described below.

5.15.1.1 Fire Protection Services

The Ventura County Fire Department (VCFD) operates Station 28, a firefighter/paramedic station located on 513 N Church Street in the town of Piru, approximately 4.5 miles southwest of Santa Felicia Dam. This station serves both Piru and the east Santa Clara River Valley (VCFD 2017). It is staffed daily by three firefighters and houses a medic/engine, a brush engine, and a patrol (VCFD 2017). CAL FIRE provides funding to the VCFD and in turn, VCFD provides first response to fires on lands serviced by CAL FIRE: these lands are designated as Station Responsibility Areas (SRAs), and the Project area is situated in one of these SRAs (CAL FIRE 2012). The Project area is located in an SRA considered to be a high fire hazard severity zone by CAL FIRE, and lands around the Project area are considered a very high fire hazard severity zone (CAL FIRE 2007, 2010). Typical emergency response time to the Santa Felicia Dam and vicinity from Station 28 is approximately 10 to 12 minutes (Gonzalez, pers. comm., 2017).

The primary fire access/escape routes for the Project area are Piru Canyon Road and Santa Felicia Canyon Fire Road (also known as East Road). When necessary, Santa Felicia Canyon Fire Road can be used as a secondary access/escape route. The VCFD also maintains three helispots located in the vicinity of the Project. During the suppression of a fire, water is drafted by emergency responders at the

penstock; fire hydrant at the dam; fire hydrants in the recreation facilities; and from Lake Piru Reservoir (at helispots or via superscooper planes) (UWCD 2009a).

The nearest fire station to Santa Felicia Dam is the USDA-FS Fire Control station north of Piru and south of the Project area at 4640 Piru Canyon Road in unincorporated Ventura County (Figure 5.15-1). Typical response time for the fire station to respond to emergencies within the vicinity of the Santa Felicia Dam is less than 10 minutes (Porter, pers. comm., 2017). However, this station is not manned year-round and only responds to fires on Federal land.

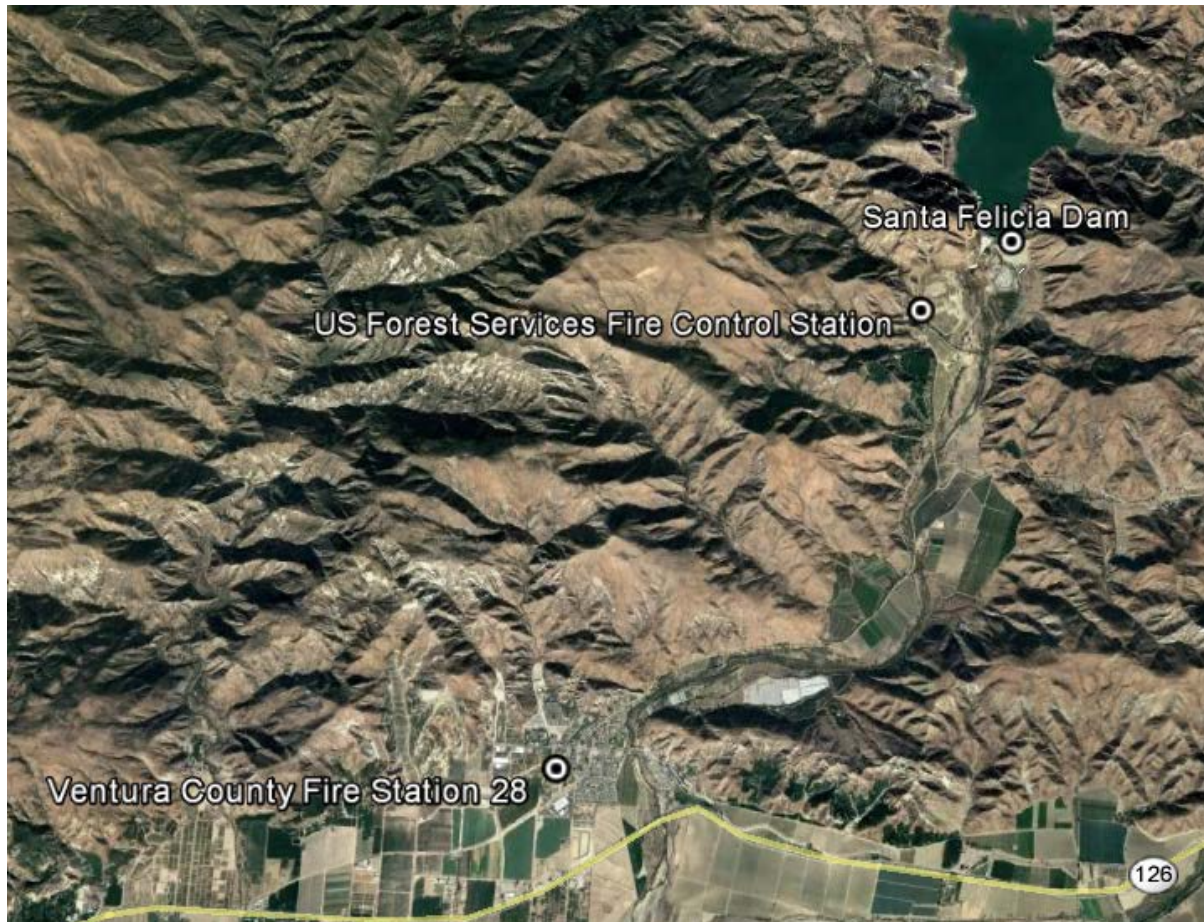


Figure 5.15-1 Fire Protection Services Station Locations near Project Area

5.15.1.2 Police Protection Services

Police services are provided to the town of Piru and the Project area by the Ventura County Sheriff's Office (VCSO) Fillmore Patrol Division, located at 524 Sespe Avenue in Fillmore. In addition to serving the city of Fillmore, the VCSO Fillmore Patrol Division serves approximately 450 square miles in the Santa Clara River Valley, including the unincorporated communities of Piru, Bardsdale, Rancho Sespe, areas around Santa Paula, and Upper Ojai (VCSO 2013a). The average response time for the City of Fillmore Police Department throughout the entire service area is 3.30 minutes for emergencies and 5.62 minutes for non-emergencies (Ventura Local Agency Formation Commission 2012).

The VCSO Office of Emergency Services is responsible for countywide disaster planning, training and exercises, public education and information, operating the County's Emergency Operations Center in response to major events and disasters, emergency alerts and warnings, and disaster recovery activities.

The nearest local emergency management office is located at 250 Central Avenue, Fillmore, approximately 13 miles away from the Project area (VCSO 2013b).

5.15.1.3 Schools

There are no schools within the Project area. The closest school is Piru Elementary School, which is located approximately 4.5 miles southwest of the Project area at 3811 Center Street in the town of Piru.

5.15.1.4 Parks

Warring Park, which consists of 3.9 acres of developed park land, including a softball diamond, basketball court, playground, horseshoe pits and grass areas, is located approximately 4.5 miles from the Project area in Piru (County of Ventura 2018). The Lake Piru Recreation Area is discussed in Section 5.16.

5.15.1.5 Other Public Facilities

Other public facilities, including the Piru Library and Piru Community Center, are located approximately 4.5 miles from the Project area in the town of Piru.

5.15.2 Regulatory Framework

The regulations related to public services that may apply to the Project are described below.

5.15.2.1 Federal

UWCD has a license from FERC (FERC License No. 2153-CA) for the Santa Felicia Hydroelectric Project. In compliance with Article 4(e), Condition No. 17(a), UWCD has prepared a Fire Management and Response Plan, which is included in their Land Resource Management Plan (UWCD 2009a).

5.15.2.2 State

5.15.2.2.1 California Health and Safety Code

State fire regulations are set forth in Section 13000 et seq. of the California Health and Safety Code, which include regulations concerning building standards, fire protection and notification systems, fire protection devices such as extinguishers and smoke alarms, and fire suppression training. These regulations would be applicable to the new intake control building, downstream control facilities, and hydroelectric plant.

5.15.2.2.2 California Building Code

California Code of Regulations, Title 24, Part 9 refers to the California Fire Code, which contains fire-safety-related building standards. These regulations would be applicable to the new intake control building, downstream control facilities, and hydroelectric plant.

5.15.2.3 Local

Although Santa Felicia Dam is located in an unincorporated area of Ventura County, it is exempt from local permit and planning requirements because it is a water storage and power generation facility, regulated by a license issued by FERC under the Federal Powers Act. Therefore, the Project is not subject to the provisions of the Ventura County General Plan or related local area plans.

5.15.2.3.1 Ventura County General Plan

The goals related to public facilities and services outlined in the Ventura County General Plan (Ventura County 2016a) are provided as follows for informational purposes:

1. Plan for public facilities and services which will adequately serve the existing and future residents of the County.

2. Promote the cost effective operation, equitable distribution, and funding and development of public facilities and services to meet the County's existing and future needs.
3. Ensure that public facilities and services are consistent with the land use and development goals, policies and programs of the County General Plan.

5.15.3 Impacts and Mitigation Measures

5.15.3.1 *Significance Criteria*

UWCD reviewed Appendix G of the CEQA Guidelines to determine whether the Project or alternatives would result in significant impacts related to public services. The criteria listed below consider if the Project would:

- a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the construction of which would cause significant environmental impacts in order to maintain acceptable service ratios, response times or other performance objectives in any of the following areas:
 - o Fire protection services.
 - o Police protection services.
 - o Schools.
 - o Parks.
 - o Other public facilities.

The Project would not require the provision of, or need for, new or physically altered governmental facilities. The nearest schools, parks, and public facilities are located 4.5 miles away from the Project area and would therefore not be impacted by Project construction or operation. Potential impacts to the Lake Piru Recreation Area are discussed in Section 5.16, Recreation.

5.15.3.2 *Proposed Project*

Impact PUB-1: The Project could result in impacts to acceptable service ratios, response times or other performance objectives of police and fire protection services (Construction – less than significant/Operation – no impact).

Construction

The addition of construction personnel to the area could result in a temporary impact to the ability of police and fire protection services to accommodate fire suppression and emergency calls. The Project would require between 12 and 42 construction workers at any one time, whose presence on the site would be temporary, with construction activities lasting up to 48 months (24 months for spillway modification and 24 months for outlet works construction).

Project construction would require large trucks, equipment, and employee vehicles to enter the Project area from Piru Canyon Road. This increase in traffic could temporarily increase the potential for accidents in these areas, necessitating increased police and emergency response services. The presence of construction-related traffic on Piru Canyon Road may slow down emergency vehicles if there is not sufficient roadway shoulder to allow the construction vehicle to safely pull out of the lane to allow the emergency vehicle to pass. Construction traffic could impede emergency response times to Lake Piru Recreation Area or other areas in the Project site. However, there are multiple alternative access points that can be used for emergency access including the access point immediately south of Rancho Temescal, immediately west of the spillway, and the Santa Felicia Canyon Fire Road providing access to the east side of the dam. Increased traffic could also delay access to and from the USFS Fire Control station, impacting the response time of USFS personnel from that location in the event of a fire on USFS

land. However, the overall volume of estimated truck traffic is relatively light, or less than five trucks per hour assuming a uniform distribution over an eight-hour work day.

In the unlikely event of a fire during construction, UWCD would implement procedures outlined in its Fire Suppression Action Plan (UWCD 2009a). Please see Section 5.9, Hazards and Hazardous Materials for further discussion on fire risk and impacts. If a fire were unable to be contained by UWCD personnel, VCFD fire protection services would be required.

Therefore, Project construction would result in less than significant impacts to acceptable service ratios, response times, or other performance objectives of police and fire protection services; however, we recommend application of MM TRAN-2 and MM HZ-3 to further reduce any impacts related to emergency response.

Operation

Project operation would not require an increase in employees or truck/equipment traffic from current conditions nor alter the potential for fire. Further, public access to the dam is currently prohibited and would continue to remain so. Therefore, there would be no impacts to police or fire protection services during operation of the proposed Project.

Mitigation Measures

MM HZ-3: Develop Fire Control and Emergency Response Plan (see Section 5.9, Hazards and Hazardous Materials).

MM TRAN-2: Emergency Vehicle Access Plan (see Section 5.17, Traffic).

Residual Impact

The Fire Control and Emergency Response Plan would be developed in coordination with local fire departments and would identify fire prevention measures and response and communication protocols in the event of an emergency. The emergency vehicle access plan would ensure that first responders can safely enter and pass through the site in the event of an on-site emergency. Implementation of MM HZ-3 and MM TRAN-2 would further reduce the already less than significant impacts associated with emergency response.

5.15.3.3 Labyrinth Alternative

Construction of the Labyrinth Alternative would require more demolition of existing structures and concrete placement and therefore more potential truck trips than the Project. However, the impacts relative to public services would be similar in extent and intensity as those described above for the Project. Accordingly, the same mitigation measure would apply and reduce impacts in the same manner as described above for the Project. Impacts would be less than significant with mitigation incorporated.

5.15.3.4 No Project Alternative

Under the No Project Alternative, the outlet works system would not be replaced and the spillway modifications would not be implemented, so there would be no impacts associated with construction.

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5.16 Recreation

This section describes the environmental and regulatory settings and discusses potential impacts associated with construction and operation of the Project components with respect to recreational resources. Table 5.16-1 summarizes the impacts on recreational resources that would result from implementation of the Project or alternatives.

Table 5.16-1 Summary of Impacts on Recreation

Impact	Project	Labyrinth Alternative	No Project Alternative	Mitigation Measures
Impact REC-1: The Project would alter recreational access for boating.	Construction – U/Operation - L	Construction – U/Operation - L	Operation - O	None identified.
Impact REC-2: The Project could reduce the quality of recreational experiences.	Construction – U/Operation - L	Construction – U/Operation - L	Operation - O	None identified.
The Project would not increase the use of existing neighbourhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.	Construction – O/Operation - O	Construction – O/Operation - O	Operation - O	None required.
The Project would not include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.	Construction – O/Operation - O	Construction – O/Operation - O	Operation - O	None required.

Note:
 O = No Impact
 L = Less than Significant Impact
 S = Significant Impact, but Mitigable to Less than Significant
 U = Significant Unavoidable Impact
 B = Beneficial Impact

5.16.1 Existing Conditions

Lake Piru Reservoir and Santa Felicia Dam are located in eastern Ventura County approximately five miles northeast of the town of Piru, California. The northern part of Lake Piru Reservoir (140 acres) is located in the Los Padres National Forest on Federal land that is administered by the USDA-FS. The Los Padres National Forest administers the Angeles National Forest land that is also situated within the Project boundary. The Project site is part of a land parcel designated in the Ventura County General Plan as Open Space. The area surrounding Lake Piru Reservoir is also designated as a Scenic Resource Area within the Ventura County General Plan (Ventura County 2016a). The Lake Piru Reservoir itself is a recreational area. The Lake Piru Recreation Area is open year-round and contains the following recreation facilities: Olive Grove, Lower Oaks and Oak Lane campgrounds, designated put-in and take-out sites for whitewater boating, Lake Piru Marina, Juan Fernandez Boat Launch Area, and Reasoner Canyon Day-Use and Overflow Area (UWCD 2009a). Lake Piru Reservoir is a popular destination for traditional lake recreation including fishing, swimming, boating, water skiing, and sailing. Lake Piru Reservoir is used by Ventura County residents and a regular influx of visitors from the Southern California region (Ventura County 2007).

The segment of lower Piru Creek situated between Santa Felicia Dam and the UWCD-Rancho Temescal property line downstream is regulated by FERC. UWCD has developed the Santa Felicia Whitewater

Boating Access Plan to comply with FERC License No. 2153-12 Article 410. This plan addresses both portage around Santa Felicia Dam and escorted access to a put-in site below the dam (UWCD 2011).

Portage around Santa Felicia Dam is available on weekends during UWCD's water conservation releases, when the releases exceed 200 cfs. Any other weekend when greater than 200 cfs is being released, whitewater boaters can portage over Santa Felicia Dam from Lake Piru Reservoir using a take-out site on the east end of the dam. From the take-out site, boaters carry their boats over the dam using an existing foot-trail down to a put-in site on the east side of lower Piru Creek below Santa Felicia Dam at USGS gage No. 11109800. Boaters can access the Lake Piru Reservoir put-in site at three locations: 1) from the bottom of middle Piru Creek, 2) Juan Fernandez launch ramp at the north end of the lake, and 3) the Lake Piru Marina (UWCD 2011).

To maintain and ensure the security of Santa Felicia Dam, whitewater boaters seeking portage from Lake Piru Reservoir over the dam to the put-in site on the east side of lower Piru Creek must notify UWCD at least 24 hours in advance. With verification of a reservation, whitewater boaters seeking portage over Santa Felicia Dam are provided free parking at the Lake Piru Recreation Area where they can access the three put-in sites. Boaters have access to public restrooms, trash cans, and other amenities. Boaters are responsible for making transportation arrangements from the take-out site back to the Lake Piru Recreation Area no later than dusk, at which time the recreation area is closed (Untied 2011).

5.16.2 Regulatory Framework

5.16.2.1 *Federal*

Pursuant to sections 4(e) and 15 of the Federal Power Act, FERC issued a license for operation of the Santa Felicia Hydroelectric Project, dated September 12, 2008. The license specifies various conditions for operation and maintenance of the Project to ensure public safety and comply with environmental regulations. Accordingly, UWCD prepared a Recreation Management Plan, Whitewater Boating Plan, and Santa Felicia Recreation Trail Plan in compliance with the requirements regarding recreation management and improvements. These plans are summarized in the sections below.

5.16.2.1.1 UWCD's Recreation Management Plan

UWCD prepared a Recreation Management Plan (September 2018) to help guide short- and long-term management and development needs for public access and recreation uses associated with the Santa Felicia Dam Hydroelectric Project. The plan evaluates current recreation facilities and uses and recommends management measures and recreation planning provisions to meet current and future needs at Lake Piru Reservoir. One of the key elements of the plan is to forgo previously planned improvements at the Juan Fernandez Boat Launch, the use of which has been significantly impacted by the recent drought and low water levels, and instead focus on making improvements to existing facilities in the main "core" areas of the Lake Piru Recreation Area to provide the greatest value to recreationists and help meet current and near term future needs (UWCD 2018c).

5.16.2.1.2 UWCD's Whitewater Boating Plan

Article 410 of the FERC License No. 2153 issued in September 2008 requires that, within three years of license issuance, UWCD file a plan for providing whitewater boating portage over Santa Felicia Dam and a permanent plan for providing whitewater boating access downstream of Santa Felicia Dam. This article of the license required UWCD to consult with the Forest Service, California Department of Parks and Recreation, American Whitewater, and the Sierra Club during plan preparation and that the plan contain documentation of the consultation, copies of comments and specific descriptions of how the comments have been accommodated. UWCD filed the required plan in 2011 and has provided whitewater boating access downstream of Santa Felicia Dam as described above in Section 5.16.1 Existing Conditions.

5.16.2.1.3 UWCD's Santa Felicia Recreation Trail Plan

Article 411 of FERC License No. 2153 requires that UWCD develop and file a plan for providing trail access to the east side of Lake Piru Reservoir. The FERC license requires that the plan: 1) identify the location of the existing trail sections to be formalized along the east side of the lake; 2) identify the location and route for providing the missing 1.5-mile trail link between Forest Service roads and other existing trails; and 3) provide a schedule for designing and constructing the new trails. While the FERC license discussed trails on the east side of Lake Piru Reservoir, a study completed by UWCD in November 2013 indicated that the east side of the lake was comprised of private land with no roads or other feasible trail opportunities on lands controlled by the license (UWCD 2018c). FERC as well as the Forest Service and California Department of Parks and Recreation all agreed with this finding in 2014, and efforts were shifted to enhancing trail access on the northwest end of Lake Piru Reservoir. UWCD revised the Recreation Trail Plan to include construction and maintenance of a parking facility intended to improve public access to the existing U.S. Forest Service Pothole Trail (No. 18W04). The updated Recreation Trail Plan was approved by FERC on January 6, 2017 and UWCD submitted a trail plan update to FERC on November 1, 2017, and again on August 15, 2018.

5.16.2.2 State

There are no State plans that apply to the analysis of impacts on recreation in the Project area; although the Lake Piru Resource Management Plan (UWCD 2018c) was prepared in consultation with California State Parks for any activities that could affect recreation.

5.16.2.3 Local

The Lake Piru Recreation Area operates under a Conditional Use Permit from Ventura County. The Conditional Use Permit covers the recreation area above the Santa Felicia Dam and does not include the dam itself. Although Santa Felicia Dam is located within unincorporated Ventura County, it is exempt from local permit requirements because it is a water storage and power generation facility and regulated by a license issued by FERC under the Federal Powers Act. Therefore, the Project is not subject to the provisions of the Ventura County General Plan. The summary below is provided for informational purposes.

5.16.2.3.1 Ventura County General Plan

The Project site is part of a land parcel designated by Ventura County for Open Space and Scenic Resource Protection; a zoning classification that designates specific parcels open to community members for outdoor recreation, as well as parcels that are noted for outstanding scenic, historic, and cultural value; areas particularly suited for park and recreation purposes, including access to lakeshores, beaches, rivers and streams; and areas which serve as links between major recreation and open-space reservations, including utility easements, banks of rivers and streams, trails, and scenic highway corridors (Ventura County 2007). UWCD has limited independent political jurisdiction over operation at the Lake Piru Recreation Area in contrast to most other regional and local parks in Ventura County (per California Government Code Section 53091, recreation facilities and the Santa Felicia Dam Maintenance Shop and Dam Tender's Residence area not exempt from County requirements); however, no specific policies in the Ventura County General Plan related to recreation are applicable to the Project area (Ventura County 2007).

5.16.3 Impacts and Mitigation Measures

5.16.3.1 Significance Criteria

UWCD reviewed Appendix G of the CEQA Guidelines to determine whether the Project would result in significant impacts related to recreation. These criteria focus primarily on demand for recreation facilities and the potential need for construction of new recreation facilities, which are not applicable to the Project.

Therefore, UWCD developed additional criteria to address potential effects of the Project on the experience of recreationalists at existing recreational facilities. These criteria are listed below and consider if the Project would:

- a. Permanently or temporarily alter a recreational resource (e.g., use of recreation lands or waters; disturbance to unique vegetation, habitat or outstanding landscape characteristics).**
- b. Reduce the quality of the recreation experience (such as from increased noise and dust, reduced visual quality from landscape modifications and night illumination, reduced visibility, and reduced water quality).**
- c. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.
- d. Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

The proposed Project is designed to improve the safety and structural stability of the Santa Felicia Dam and does not involve construction or expansion of recreational facilities. Further, the proposed Project would not result in increased population, an increase in the demand for or use of any recreational facilities, or impede future development of recreational parks, facilities, or trails. Therefore, there would be no impact under significance criteria c or d, and these criteria are not discussed further.

5.16.3.2 Proposed Project

Impact REC-1: The Project would alter recreational access for boating (Construction – significant and unavoidable impact /Operation – less-than-significant impact).

Construction

Construction efforts associated with the proposed Project would temporarily alter the existing recreational resources of the Lake Piru Reservoir through the lowering of the reservoir to 950 feet msl or lower to accommodate construction activities. This water level is below the current minimum pool elevation of 980 feet msl and would require the temporary closure of recreational activities in the lake (i.e., recreational boating, fishing, swimming, etc.), as well as whitewater boating in lower Piru Creek for up to 21 months during the construction period. No mitigation measures are available to minimize these adverse effects during construction. Therefore, temporary impacts to recreational access for boating would be significant and unavoidable. The water supply to the recreational facilities, including campgrounds and irrigation systems would be modified during the construction. The lower reservoir levels would push the water system intake to its hydraulic limits, assuming no dramatic changes in the sediment elevations beneath the pump barge.

Operation

The Project includes the placement of a floating trash/debris boom across the dam, spillway, and intake that would also act as a safety/security barrier to recreational boaters, such that boaters are unable to access the intake. The boom would also provide additional safety measures when the lake is spilling. This boom would slightly modify the area within the lake that boaters are currently able to use. The Project would not alter any other recreational resources associated with Lake Piru Reservoir or Piru Creek. Existing take-out and put-in points for whitewater boating would not be affected by operations of the Project. Project operations would not permanently remove any unique vegetation or habitat which would affect the quality of recreational activities (e.g., hiking and whitewater boating) in Lake Piru Recreation

** Indicates a project-specific criterion developed by UWCD to address potential effects to recreation that are not addressed under Appendix G of the CEQA guidelines.

Area or Piru Creek. Operations would remain consistent with historical procedures; therefore, impacts to recreation would be less than significant.

Impact REC-2: The Project could reduce the quality of the recreation experience at Lake Piru Reservoir and in Piru Creek (Construction – significant and unavoidable/Operation – less than significant).

Construction

Project construction would result in temporary impacts to recreation at Lake Piru Reservoir. During construction, the water level in the reservoir would be lowered to 950 feet msl or lower to accommodate construction activities. This water level is below the current minimum pool elevation of 980 feet msl and would require the temporary closure of recreational activities in the lake (i.e., recreational boating, fishing, swimming, etc.) as well as whitewater boating in lower Piru Creek during the construction period. In addition, water supply to the recreational facilities would be disconnected during the construction activities. Access to recreational facilities located within Lake Piru Recreation Area, described in Section 5.16.1, may also be temporarily restricted due to construction vehicles and equipment. No mitigation measures are available to minimize these adverse effects during construction. Therefore, temporary impacts to the quality of the recreational experience at the Lake Piru Reservoir and in Piru Creek would be significant and unavoidable.

Construction activities may temporarily reduce the quality of the recreation experience at the reservoir due to increased noise and dust. As discussed in Section 5.13, noise levels in the Project area would increase from 49 dB to 53 dB during the noisiest period of construction activity. Increased noise levels could result in adverse effects to bird-watching and wildlife viewing as birds and wildlife may avoid the area during construction activities. Further, construction vehicles and equipment would be visible from Lake Piru Reservoir and from Piru Canyon Road, the main access route to Lake Piru Recreation Area, and construction activities would increase dust levels as earth-moving is conducted; this would result in adverse effects to visual resources for boaters, picnickers, and hikers at Lake Piru Recreation Area above the dam. Construction would be temporary, projected to last 48 months. Mitigation measures and project design features, as described in Sections 5.4, Air Quality, and 5.13, Noise, would minimize noise and dust to the extent practicable. Therefore, impacts to the quality of the recreation experience associated with noise and dust during construction would be temporary and less than significant.

Operation

The Project includes the placement of a floating trash/debris boom across the dam, spillway, and intake that would also act as a safety/security barrier to recreational boaters, such that boaters are unable to access the intake and to provide additional safety measures when the lake is spilling. This boom would slightly modify the area within the lake that boaters are able to use. The Project would not alter any other recreational resources associated with Lake Piru Reservoir or Piru Creek. The new intake structure would be visible to recreationists on the reservoir, but it would replace an existing structure. The new hydropower plant would be visible to whitewater boaters on lower Piru Creek, but it would also replace an existing structure and be built within the existing dam infrastructure footprint. Operations would remain consistent with historical procedures; there would be no increase in noise or dust, and no decrease in visibility or water quality that would impact recreationists. Therefore, impacts to recreational quality during Project operation would be less than significant.

5.16.3.3 Labyrinth Alternative

The construction requirements for this alternative would be similar to those described for the Project including lowering of the water levels in Lake Piru Reservoir, demolition, concrete placement, excavation, and spillway bridge modifications. However, the duration of construction activity would be slightly longer, resulting in a longer duration of temporary impacts to recreation activities at Lake Piru Reservoir although

the magnitude of impacts would be similar in extent and intensity as those described for the proposed Project. Operation of this alternative would be the same as that for the Project. Accordingly, impacts to recreation associated with the Labyrinth Alternative would be similar in extent and intensity as those described above for the proposed Project for each significance criterion.

5.16.3.4 No Project Alternative

Under the No Project alternative, no construction activity would occur. There would also be no change in dam operations. Although the spillway would not meet the safety requirements and the intake tower may fail due to seismic loading, these would not lead to a change to recreational resources.

5.17 Transportation and Traffic

This section describes the potential impacts on transportation and traffic that could arise from the construction and operation of the proposed facilities. The region of influence for transportation includes existing and proposed public and private roadways that would provide access for Project-related traffic, including construction worker trips, the delivery and removal of construction equipment and materials, and the transport of fill material and construction debris. Table 5.17-1 summarizes impacts on transportation and traffic that could result from implementation of the Project or alternatives.

Table 5.17-1 Summary of Impacts on Transportation and Traffic

Impact	Project	Labyrinth Alternative	No Project Alternative	Mitigation Measures
Impact TRAN-1: The Project would not substantially increase hazards due to a design feature or incompatible uses.	Construction – L/Operation – O	Construction – L/Operation – O	Construction – O/Operation – O	MM TRAN-1: Temporary Signage
Impact TRAN-2: The Project would not result in inadequate emergency access.	Construction – L/Operation – O	Construction – L/Operation – O	Construction – O/Operation – O	MM TRAN-2: Emergency Vehicle Access Plan MM HZ-3 Fire Control and Emergency Response Plan
The Project would not conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system.	Construction – O/Operation – O	Construction – O/Operation – O	Construction – O/Operation – O	None required
The Project would not conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.	Construction – O/Operation – O	Construction – O/Operation – O	Construction – O/Operation – O	None required
The Project would not result in a change in air traffic patterns, including either an increase in traffic levels or a change in the location that results in substantial safety risks.	Construction – O/Operation – O	Construction – O/Operation – O	Construction – O/Operation – O	None required
The Project would not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.	Construction – O/Operation – O	Construction – O/Operation – O	Construction – O/Operation – O	None required

Note:

- O = No Impact
- L = Less than Significant Impact
- S = Significant Impact, but Mitigable to Less than Significant
- U = Significant Unavoidable Impact
- B = Beneficial Impact

5.17.1 Existing Conditions

Piru Canyon Road is a Ventura County-maintained roadway that provides access to and from the Project area. Maintenance of Piru Canyon Road by the County stops at the entrance to the Lake Piru Recreation Area at which point UWCD is responsible for the roadway to a point north of Reasoner Canyon. From that point north to the soon to be decommissioned Blue Point Campground, the USDA-FS is responsible for roadway maintenance. This two-lane paved roadway runs along a generally north/south alignment between State Route 126 (approximately six miles west of the Ventura-Los Angeles County Line), through the town of Piru to the Blue Point Campground located to the north of Lake Piru Reservoir. Piru Canyon Road is a component of Ventura County's Local Road Network (Ventura County 2007). It has numerous elevation changes and tight radius turns, particularly near Lake Piru Reservoir and the northern portion of the Santa Felicia Dam property. No local or regional transit service or designated bicycle lanes are provided on Piru Canyon Road (Ventura County 2017). In 2016, Piru Canyon Road had an Average Daily Traffic (ADT)¹ volume of 500 vehicles per day, including 60 in the morning peak hour and 40 in the afternoon peak hour north of Orchard Road (Ventura County 2016b).

Ventura County classifies roadways based on the design and intended function of the roadway, accounting for factors such as vehicle speed, volume of traffic, and access to adjacent land uses. Piru Canyon Road is classified as a Minor Collector, and the "main purpose of collectors is to provide local access to the overall roadway network. Collectors channel traffic from local roadways into the arterial network" (Ventura County 2017).

As shown in Figure 3-1, there is an existing unpaved roadway, designated as the main access for heavy construction equipment, that extends from Piru Canyon Road along a northeasterly alignment through the Rancho Temescal property to Santa Felicia Dam and adjacent areas. Existing roads in and around the dam property are both paved and unpaved. There is an existing paved road that provides access from Piru Canyon Road to the existing spillway, to the south and west of Lake Piru Reservoir. Each of these roadways accommodate local traffic, and none are included in the Ventura Local or Regional Road Networks.

5.17.2 Regulatory Framework

5.17.2.1 Federal

There are no Federal regulations that relate to transportation and traffic that apply to this Project.

5.17.2.2 State

Caltrans is the State agency responsible for the design, construction, maintenance, and operation of the California State Highway System, as well as segments of the Interstate Highway System that lie within California's boundaries. Caltrans District 7 in Los Angeles is responsible for the operation and maintenance of State Route 126 and other State-administered facilities in Ventura County, as well as other State-maintained highways in Los Angeles County. Caltrans requires a transportation permit for any transport of heavy construction equipment and/or materials that necessitates oversized vehicles on State highways. No other State regulations related to transportation or traffic apply to the Project.

5.17.2.3 Local

Although Santa Felicia Dam is located in unincorporated Ventura County, it is exempt from local permit requirements because it is a water storage and power generation facility and is regulated by a license issued by FERC under the Federal Powers Act. Accordingly, Ventura County General Plan goals related to discretionary developments (e.g., encouraging public transit, bicycling, and ridesharing) do not apply to

¹ ADT refers to the number of vehicles passing over a given point on a roadway in both directions of travel over a 24-hour period.

the Project. However, the public roadways that provide access to the Project site are under the jurisdiction of Ventura County and, therefore, the Project must comply with the Level of Service (LOS)² standards established for these roads in the Ventura County General Plan.

5.17.2.3.1 Ventura County General Plan

Relevant goals from the Ventura County General Plan (Ventura County 2016a) are summarized below:

1. The minimum acceptable LOS for road segments and intersections within the Regional Road Network and Local Road Network shall be as follows:
 - a. LOS-D for all County thoroughfares, Federal and State highways in the unincorporated area of the County, except as otherwise provided in subparagraph (b);
 - b. LOS-E for State Route 33 between the northerly end of the Ojai Freeway and the City of Ojai, Santa Rosa Road, Moorpark Road north of Santa Rosa Road, State Route 34 north of the City of Camarillo, and State Route 118 between Santa Clara Avenue and the City of Moorpark;
 - c. LOS-C for all County-maintained local roads; and
 - d. The LOS prescribed by the applicable city for all Federal and State highways, city thoroughfares, and city-maintained local roads located within that city, if the city has formally adopted General Plan policies, ordinances, or a reciprocal agreement with the County respecting development in the city that would individually or cumulatively affect the LOS of Federal and State highways, County thoroughfares, and County-maintained local roads in the unincorporated area of the County.
2. At any intersection between two roads, each of which has a prescribed minimum acceptable LOS, the lower LOS of the two shall be the minimum acceptable LOS for that intersection.

5.17.2.3.2 Encroachment Permit

The Ventura County Public Works Agency requires an Encroachment Permit for all signs posted and any work conducted within the County right-of-way.

5.17.3 Impacts and Mitigation Measures

5.17.3.1 Significance Criteria

UWCD reviewed Appendix G of the CEQA Guidelines to determine whether the Project would result in significant impacts related to transportation and traffic. The criteria listed below consider if the Project would:

- a. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- b. Result in inadequate emergency access.
- c. Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.

² LOS is a method used to rate the performance of streets, intersections, and other highway facilities based on factors such as vehicle delay, vehicle speed, and vehicle density. LOS rates performance on a scale of A to F, with LOS A reflecting free flowing conditions and LOS F representing heavily congested conditions (Transportation Research Board 2016).

- d. Conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.
- e. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in the location that results in substantial safety risks.
- f. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Project construction would temporarily increase traffic volumes on roads and intersections that provide access to the Project area. Project-related construction traffic would consist of trips by construction workers; trips for the delivery and removal of construction equipment and materials; and trips for the transport of construction debris and fill material. Construction worker traffic would consist of passenger vehicles and would be concentrated during peak commuting periods. Other trips would involve trucks, and these trips would be distributed throughout the day based on the needs of the Project.

The number and type of trips generated by the Project were estimated based on construction information provided by GEI (GEI 2017a, b) and tables contained in the technical memorandum, “Updated GEI Construction Equipment Tables – Conversion to CEQA Usability Format” (Catalyst 2018). As shown in this document, each construction activity (e.g., Spillway Widening) is subdivided into a series of sub-phases, called construction segments. Each construction segment has a specific duration, and several construction segments may overlap over the course of a construction activity. In order to estimate the maximum traffic generation associated with each construction activity, the following steps were taken:

1. The schedule for each construction activity was reviewed to identify overlapping construction segments.
2. The number of off-site passenger vehicle and truck trips for the overlapping construction segments were added together.
3. Where there were two or more groups of overlapping construction segments, the group having the highest combined traffic volume was selected to represent the maximum traffic generation of the construction activity.

Table 5.17-2 summarizes the maximum daily traffic generation for construction of the spillway widening and deepening and outlet works using the approach described above. The impacts of trucks operating on hilly segments of Piru Canyon Road are expressed using Passenger Car Equivalent Vehicle (PCEV) conversion factors published in the Highway Capacity Manual (Transportation Research Board 2016).

Table 5.17-2 Construction Daily Traffic Generation

Construction Activity	Passenger Vehicle Trips (a)	Truck Trips (a)	Total Trips (b)	PCEV Factor (c)	Adjusted Total Trips (d)
Outlet Works System (Component 1)	84	37	102	1.9	154
Spillway Widening Option (Component 2)	64	28	92	1.9	117
Spillway Deepening Option (Component 2)	64	20	84	1.9	102

Note:

- (a) External passenger vehicle and truck trips from concurrent construction activities (GEI 2017a, b; Catalyst 2018).
- (b) Passenger vehicle trips + truck trips.
- (c) PCEV factor, a method used to convert truck trips into equivalent passenger vehicle trips taking into account the larger size and relatively sluggish performance of trucks and considering terrain (Transportation Research Board 2016).
- (d) Total trips (passenger vehicle trips plus truck trips x PCEV factor) expressed as passenger vehicle trips.

The Ventura County General Plan has established a minimum vehicular performance standard of LOS C for County-maintained roads, which includes Piru Canyon Road. As discussed above, the existing traffic volume on Piru Canyon Road is 500 ADT, and this roadway is characterized as having LOS A conditions. As shown in Table 5.17-2, the Project's maximum traffic increase (i.e., Adjusted Total Trips) during construction of the spillway modifications would be 117 daily trips under the Spillway Widening Option, resulting in a combined ADT of 617, and the maximum increase during construction of the outlet works would be 154 daily trips, resulting in a combined ADT of 654. Because the maximum volume associated with LOS A is 1,500 ADT, the temporary incremental traffic increase during either phase of construction would not change existing LOS (Ventura County 2017). Furthermore, the Ventura County General Plan does not provide any measures of effectiveness for transit or other non-automobile travel modes, none of which are accommodated on Piru Canyon Road in any case. Therefore, there are no impacts with regard to criterion c.

Piru Canyon Road is not a component of the Ventura County Congestion Management Program (CMP) network (Ventura County Transportation Commission [VCTC] 2009); therefore, there would be no potential conflict with CMP standards or measures with respect to this roadway. Project traffic may also occur on CMP network roadways in Ventura County, such as State Route 23, State Route 126, State Route 150. The Project would involve a temporary traffic increase on these roadways that is below the 200 peak hour trips threshold that would warrant a project-level impact analysis (VCTC 2009). Given the relatively low and temporary traffic volume increase and considering the fact that Project traffic is below the threshold warranting impacts analysis, the Project would not conflict with applicable CMP standards and measures, and criterion d is not discussed further.

The Project involves land-based construction activities only; therefore, the Project would not create any new air traffic or involve the relocation or other modification of existing air traffic, and criterion e is not discussed further.

Access to and from the Project Area would be provided via Piru Canyon Road, which does not accommodate public transit service or provide any facilities for bicyclists or pedestrians. Although the Project would involve vehicular traffic only (i.e., passenger vehicles and trucks), it would not conflict with adopted polices, plans, and programs to encourage the use of alternative transportation. Project construction would not alter the surrounding transportation system, and therefore would not preclude the future establishment of transit, bicycle, and/or pedestrian facilities. Thus, there would be no impacts to alternative transportation or bus transit, and criterion (f) is not discussed further.

5.17.3.2 Proposed Project

Impact TRAN-1: The Project would not substantially increase hazards due to a design feature or incompatible uses (Construction - less than significant, Operation – no impact).

Construction

The Project would not modify any dam access points or external roadways. However, the Project would make various changes to roads within the dam property boundary. Specifically, the Spillway Widening Option would replace the existing one-lane bridge above the spillway and realign a portion of internal road to the west of the bridge, east of Piru Canyon Road. The internal roadway improvements are being designed to comply with relevant engineering criteria and other applicable regulations, which include traffic safety. Accordingly, Project construction would not introduce any design features that would substantially increase hazards. The Project would temporarily increase truck traffic on Piru Canyon Road, and possible safety concerns could arise from reduced roadway visibility caused by the trucks and/or motorists attempting to pass the trucks. However, trucks would be routed to the southern dam access points, thus minimizing the volume of truck traffic on the segment of Piru Canyon Road to the north, which is characterized by rolling terrain and sharp turns. Therefore, the impact would be less than significant; however, we recommend application of MM TRAN-1 to further reduce any potential safety hazards.

Operation

Project operation would not change existing operations at the dam; therefore, there would be no long-term operations impacts related to transportation and traffic.

Mitigation Measure

MM TRAN-1: Temporary Signage. In order to further reduce any potential safety hazards, UWCD shall install temporary signage on Piru Canyon Road to the north and to the south of the Project access points and periodically at least every two miles in both directions over the duration of construction, advising motorists of the presence of construction trucks on this roadway.

Residual Impact

Implementation of MM TRAN-1 would further reduce the already less-than-significant impact associated with Impact TRAN-1 by providing notice to motorists to be alert for construction trucks.

Impact TRAN-2: The Project would not result in inadequate emergency access (Construction - less than significant, Operation – no impact).

Construction

As discussed above, the Project would not modify any dam access points or external roadways, and Piru Canyon Road is expected to remain open to traffic during construction. Therefore, the Project would not prevent emergency vehicle access via Piru Canyon Road to the north and to the south of the Project. However, the presence of construction-related traffic on Piru Canyon Road may slow down emergency vehicles if there is not sufficient roadway shoulder to allow the construction vehicle to safely pull out of the lane to allow the emergency vehicle to pass. The overall volume of estimated truck traffic is relatively light, or less than five trucks per hour assuming a uniform distribution over an eight-hour work day. Moreover, as noted in Impact TRAN-1 above, truck traffic would be routed to the southern dam access points, which are located on relatively flat terrain with minimal obstructions to sight distance and with wide unpaved roadway shoulders to accommodate vehicles pulling off the roadway. Further, large-sized truck trips will be scheduled during off peak hours as feasible. Although construction activities within the immediate vicinity of Santa Felicia Dam could temporarily block first responders to an emergency within the site, there are multiple alternative access points that can be used for emergency access. These include the access point immediately south of Rancho Temescal, immediately west of the spillway, and the Santa Felicia Fire Road providing access to the east side of the dam. Therefore, the impact would be less than significant. In addition to emergency vehicle access, the project would result in a less than significant impact with regard to general access, including by utility company vehicles. MM TRAN-2 is recommended to ensure adequate access for emergency vehicles. The Fire Control and Emergency Response Plan as identified in Section 5.9 as MM HZ-3 will include response and communication protocols in the event of an emergency and further reduce any impacts related to emergency response.

Operation

Project operation would not change existing operations at the dam; therefore, there would be no long-term operations impacts related to transportation and traffic.

Mitigation Measure

MM TRAN-2: Emergency Vehicle Access Plan. Implement an emergency vehicle access plan to ensure that first responders can safely enter and pass through the site in the event of an on-site emergency. The plan shall address maintaining open connections to Piru Canyon Road and minimizing the blockage of internal roadways over the course of construction. If the alternate transportation routes utilized in the final project design are unable to accommodate increased traffic flow and emergency access would be impeded, UWCD shall construct a paved turn-out pocket midway between Center Street and construction site location, northbound on Piru Canyon Road.

MM HZ-3: Fire Control and Emergency Response Plan. UWCD shall develop a Fire Control and Emergency Response Plan, as described in Section 5.9.

Residual Impact

Implementation of MM TRAN-2 and MM HZ-3 would further reduce the already less than significant impacts associated with Impact TRAN-2 by minimizing potential obstructions to emergency vehicle access within the site during construction.

5.17.3.3 Labyrinth Alternative

As shown in Table 5.17-3, options associated with the Labyrinth Alternative would generate 240 PCEV daily trips, which is substantially greater than the number of trips estimated for the proposed Project. Piru Canyon Road would continue to be characterized by LOS A with the addition of traffic from either Labyrinth Alternative option. Traffic generated during construction of the outlet works would be the same under the Labyrinth Alternative as that described for the proposed Project.

Table 5.17-3 Labyrinth Alternative Construction Daily Traffic Generation

Construction Activity	Passenger Vehicle Trips (a)	Truck Trips (a)	Total Trips (a)	PCEV Factor (b)	Adjusted Total Trips (c)
Outlet Works System (Component 1)	84	37	102	1.9	154
Spillway Widening Option (Component 2)	80	84	164	1.9	240
Spillway Deepening Option (Component 2)	56	94	150	1.9	235

Note:

- (a) External passenger vehicle and truck trips from concurrent construction activities (Catalyst 2018).
- (b) Passenger vehicle trips + truck trips.
- (c) Passenger car equivalent vehicle (PCEV) factor, a method used to convert truck trips into equivalent passenger vehicle trips taking into account the larger size and relatively sluggish performance of trucks and considering terrain (Transportation Research Board 2016).
- (d) Total trips (passenger vehicle trips plus truck trips x PCEV factor) expressed as passenger vehicle trips.

In terms of internal roadway changes, both spillway construction options are analogous to the options described for the proposed Project. Given the similarities between the Labyrinth Alternative options and the spillway modification options described for the proposed Project, impacts would be the same as described for the Project.

This alternative would temporarily increase truck traffic on Piru Canyon Road, and possible safety concerns could arise from reduced roadway visibility caused by the trucks and/or motorists attempting to pass the trucks. However, as described for the proposed Project, trucks would be routed to the southern dam access points, thus minimizing the volume of truck traffic on the segment of Piru Canyon Road to the north, which is characterized by rolling terrain and sharp turns. Therefore, the impact would be less than significant.

The presence of construction-related traffic on Piru Canyon Road may slow down emergency vehicles if there is not sufficient roadway shoulder to allow the construction vehicle to safely pull out of the lane to allow the emergency vehicle to pass. The overall volume of estimated truck traffic under this alternative is relatively light, or up to roughly 12 trucks per hour if the spillway deepening option is selected, assuming a uniform distribution over an eight-hour work day. Moreover, as noted in Impact TRAN-1 above, truck traffic would be routed to the southern dam access points, which are located on relatively flat terrain with

minimal obstructions to sight distance and with wide unpaved roadway shoulders to accommodate vehicles pulling off the roadway. Although construction activities within the immediate vicinity of Santa Felicia Dam could temporarily block first responders to an emergency within the site, there are multiple alternative access points that can be used for emergency access. Therefore, the impact would be less than significant.

Project operation would not change existing operations at the dam; therefore, there would be no long-term operations impacts related to transportation and traffic under Alternative 2.

5.17.3.4 No Project Alternative

Under the No Project Alternative, no new construction would occur, nor would any activities occur that would result in increased traffic. As discussed in Section 2, the probability of occurrence of the updated IDF of 220,000 cfs is approximately 0.05 percent in any given year (approximately once every 2,000 years). If the 2,000-year recurrence interval flow represented by the updated IDF did occur, then the Piru Creek watershed would invariably be flooded, which could cause flooding and significant damage to local roadways. The resulting impacts would likely be significant with respect to criterion (b) as it would significantly impact and limit access of emergency vehicles to the area.

5.18 Tribal Cultural Resources

This section evaluates potential impacts of the Project on tribal cultural resources, which are defined in PRC Section 21074(a)(1-2)e as follows:

- > Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
 - Included or determined to be eligible for inclusion in the California Register of Historical Resources.
 - Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.
- > 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 Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.
- > A cultural landscape that meets the criteria of subdivision (a) is a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape.
- > A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a “nonunique archaeological resource” as defined in subdivision (h) of Section 21083.2 may also be a tribal cultural resource if it conforms with the criteria of subdivision (a).

As indicated in Table 5.18-1, no impacts would occur on tribal cultural resources.

Table 5.18-1 Summary of Impacts on Tribal Cultural Resources

Impact	Project	Labyrinth Alternative	No Project Alternative	Mitigation Measures
The Project would not cause a substantial adverse change in the significance of a tribal cultural resource.	Construction – O/Operation - O	Construction – O/Operation - O	Operation - O	None required

Note:

- O = No Impact
- L = Less than Significant Impact
- S = Significant Impact, but Mitigable to Less than Significant
- U = Significant Unavoidable Impact
- B = Beneficial Impact

5.18.1 Existing Conditions

A Historic Properties Management Plan (HPMP) was prepared for the Santa Felicia Hydroelectric Project (FERC Project No. 2153-012) in accordance with FERC licensing requirements. For Federal actions, FERC must comply with Section 106 of the NHPA. In the event of significant cultural resources, compliance may include entering into a Programmatic Agreement (PA) or Memorandum of Agreement (MOA) with the Advisory Council on Historic Preservation (ACHP), the SHPO, and/or the Tribal Historic Preservation Officer (THPO) for affected tribal lands or affected lands within the traditional territory of a tribe. Because it is not possible to determine all of the effects of various activities that may occur over the course of the license period for the Santa Felicia Hydroelectric Project, the PA or MOA typically provides, and FERC typically requires, that the licensee develop and implement an HPMP.

Licensing Article 414 of the Santa Felicia Hydroelectric Project license incorporates measures to protect historic properties including consultation with the California SHPO, Los Padres National Forest, the Santa Ynez Band of Chumash Indians, and the Chumash community, and development and implementation of a HPMP. The HPMP was developed in consultation and coordination with UWCD, project archaeologist Robert Wlodarski, Los Padres National Forest and Angeles National Forest land managers, Barbareño/Ventureño Band of Mission Indians, Santa Ynez Band of Chumash Indians, and local representatives in 2010. The HPMP establishes a decision-making process for considering the potential effects of activities associated with the Santa Felicia Hydroelectric Project on extant historic properties. It identifies the nature and significance of historic properties that may be affected by project maintenance and operations, any proposed improvements to project facilities and public access; e.g., project operations that may cause erosion can result in the loss of archaeological sites located along shorelines; construction of recreational facilities that provide greater public access can damage archaeological sites (Wlodarski and MacFarlane 2011).

On March 1, 2017, a request was submitted to the NAHC to provide contact information for Native American tribal organizations and individuals with traditional lands or cultural places located within Ventura County. The NAHC responded on March 6, 2017, providing a list of regional Native American contacts. On March 31, 2017, UWCD sent letters to each of the individuals listed below inquiring if they wished to consult on the Project, if they had any knowledge of cultural resources or values in the area, if they had any concerns with the proposed Project, and asking for a response within 30 days, per PRC Section 21080.3.1(d) requirements:

- > Kenneth Kahn, Tribal Chair – Santa Ynez Band of Chumash Indians
- > Julie Lynn Tumamait-Stenslie, Tribal Chair – Barbareño/Ventureño Band of Mission Indians
- > Patrick Tumamait - Barbareño/Ventureño Band of Mission Indians
- > Eleanor Arrellanes - Barbareño/Ventureño Band of Mission Indians
- > Raudel Joe Banuelos, Jr. - Barbareño/Ventureño Band of Mission Indians
- > Mia Lopez, Tribal Chair – Coastal Band of the Chumash Nation

In addition to the above tribal contact, UWCD sent a letter on September 25, 2017 to the Fernandeano Tataviam Band of Mission Indians following receipt of a request for information on an unrelated project within the Lake Piru Recreation Area.

The letters indicated that the Project site is disturbed, and no known prehistoric resources are present. UWCD conducted surveys of the Project APE, as described in Section 5.6, and did not identify any prehistoric resources. In addition to the letters, UWCD also followed up with emails to each of the individuals listed above per information provided by the NAHC. No responses have been received at the time of preparation of this EIR; thus, no further consultation is required, and the data indicate that no tribal cultural resources are present.

5.18.2 Regulatory Framework

5.18.2.1 *Federal*

No Federal regulations related to tribal cultural resources apply to the Project.

5.18.2.2 State

5.18.2.2.1 Assembly Bill 52

Assembly Bill 52 (AB 52) went into effect July 1, 2015 and requires lead agencies to consult with California Native American tribes that have requested formal consultation on a project. Accordingly, PRC sections 21080.3.1 and 21080.3.2 require the following:

Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide for formal notification to the designated contact of, or a tribal representative of, traditionally affiliated California Native Tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section.

5.18.2.3 Local

No local regulations related to tribal cultural resources apply to the Project.

5.18.3 Impacts and Mitigation Measures

5.18.3.1 Significance Criteria

UWCD reviewed Appendix G of the CEQA Guidelines to determine whether the Project would result in significant impacts related to tribal cultural resources. The criteria listed below consider if the Project would:

- a. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in PRC section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:
 - i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in PRC Section 5020.1(k), or
 - ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1. In applying the criteria set forth in subdivision (c) of PRC Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

5.18.3.2 Proposed Project

As discussed in Section 5.6, cultural resource surveys of the APE did not identify any cultural resources. In addition, tribal representatives have not indicated the presence of cultural resources in the APE. Because no tribal cultural resources have been identified in the area affected by the Project, no impacts would occur.

5.18.3.3 Labyrinth Alternative

As discussed in Section 5.18.1, no tribal cultural resources have been identified in the area affected by this alternative, which is the same geographic area as the Project; therefore, no impacts would occur.

5.18.3.4 No Project Alternative

No impacts on tribal cultural resources would occur because no Project-related ground disturbance would occur.

5.19 Utilities and Service Systems

This section describes utilities and service systems located in the vicinity of the Project area, and discusses potential impacts associated with construction and operation of the Project on utilities and service systems. This includes water supply, wastewater, and landfill services. Table 5.19-1 summarizes the impacts on utilities and service systems that would result from implementation of the Project and alternatives.

Table 5.19-1 Summary of Impacts on Utilities and Service Systems

Impact	Project	Labyrinth Alternative	No Project Alternative	Mitigation Measures
The Project would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.	Construction – O/Operation - O	Construction – O/Operation - O	Operation - O	None required
The Project would not require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental impacts.	Construction – O/Operation - O	Construction – O/Operation - O	Operation - O	None required
The Project would not require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.	Construction – O/Operation - O	Construction – O/Operation - O	Operation - O	None required
The Project would have sufficient water supplies available to serve the Project from existing entitlements and resources and no new or expanded entitlements needed.	Construction – O/Operation - O	Construction – O/Operation - O	Operation - U	None required
The Project would not result in a determination by the wastewater treatment provider that serves or may serve the Project that it has inadequate capacity to serve the Project's projected demand in addition to the provider's existing commitments.	Construction – O/Operation - O	Construction – O/Operation - O	Operation - O	None required
The Project would be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs.	Construction – O/Operation - O	Construction – O/Operation - O	Operation - O	None required
The Project would comply with Federal, State, and local statutes and regulations related to solid waste.	Construction – O/Operation - O	Construction – O/Operation - O	Operation - O	None required

Note:

- O = No Impact
- L = Less than Significant Impact
- S = Significant Impact, but Mitigable to Less than Significant
- U = Significant Unavoidable Impact
- B = Beneficial Impact

5.19.1 Existing Conditions

The Project area is located in an unincorporated area of Ventura County and is designated by the Ventura County General Plan as Open Space (Ventura County 2011). The nearest community is the town

of Piru, located approximately five miles southwest of Santa Felicia Dam. The nearest utilities and service systems to the Project area and town of Piru are described below.

5.19.1.1 Wastewater Treatment

The Ventura County Waterworks District No. 16, governed by the Ventura County Board of Supervisors, provides sanitation services to approximately 400 customers in the town of Piru. The Ventura County Waterworks District No. 16 maintains and operates the Piru Wastewater Treatment plant, which began operations in February 2010 and can treat up to 0.5 million gallons of wastewater per day (VCPWA n.d.). While the plant services the town of Piru, it does not provide wastewater services to the Lake Piru Recreation Area or Santa Felicia Dam. Wastewater from the Lake Piru Recreation Area and Santa Felicia Dam maintenance facilities is disposed of in septic systems, leech fields, and seepage pits. Restrooms for construction workers at Lake Piru Reservoir are provided by temporary mobile facilities.

5.19.1.2 Water Supply

The Santa Felicia Dam can store up to approximately 82,000 acre-feet of water. This water is subsequently released from Lake Piru Reservoir for use in recharging downstream groundwater basins, irrigation delivery, and indirect municipal and industrial delivery. UWCD constantly monitors water supply levels, including groundwater, throughout its service area (UWCD 2010b). Potable water for drinking at the Lake Piru Recreation Area is provided by Lake Piru Reservoir. Santa Felicia Dam maintenance facilities use water from the penstock and a shallow well located in the vicinity of Santa Felicia Dam.

5.19.1.3 Solid Waste Disposal

Solid waste at Lake Piru Reservoir is collected by a private contractor and sent to either the Fillmore Recycling Center or Toland Road Landfill. The Fillmore Recycling Center is located approximately 13 miles away from the Santa Felicia Dam at 636 W Ventura Street, Fillmore. The Toland Road Landfill is located approximately 20 miles from the Santa Felicia Dam at 3500 Toland Road in unincorporated Ventura County. It is managed by the Ventura Regional Sanitation District (VRSD) and services residents of the Santa Clara Valley as well as commercial loads processed through a Ventura County transfer station or material recycling facility (VRSD 2017a). The Toland Road Landfill, which accepts solid residential, commercial, non-hazardous industrial, and agricultural waste and de-watered sludge, has a total permitted capacity of 30 million cubic yards, current design capacity of approximately 22.8 million cubic yards, and remaining capacity of approximately 10 million cubic yards or 7.2 million tons (VRSD 2016; 2017b). Based on the permitted design capacity, maximum tonnage limit, and final grades, the Ventura County Sanitation District estimates the landfill may not reach its design capacity until 2036 (9 years after its permitted closure date of May 21, 2027) (VRSD 2016).

The Chiquita Canyon Sanitary Landfill is located approximately 14 miles from the dam at 29201 Henry Mayo Drive, Castaic. Chiquita Canyon is operated by Waste Connections and serves the Santa Clarita Valley and surrounding Los Angeles communities. It accepts non-hazardous solid wastes, including municipal solid waste, residential and commercial waste, yard waste, green waste (for composting or recycling), clean fill soil, and construction/demolition debris (Waste Connections, Inc. 2016). The landfill reached its previous capacity of 23 million tons in 2016, and in June 2017 received approval from the Los Angeles Board of Supervisors to continue operating for an additional 30 years or until it reaches a capacity of approximately 60 million more tons of waste, whichever occurs first (Los Angeles County Government 2017). None of these facilities accept hazardous waste.

5.19.2 Regulatory Framework

The federal, state, and local regulations in place to manage utilities and service systems that may apply to the Project are described below.

5.19.2.1 Federal

5.19.2.1.1 CWA Section 402

As discussed in Section 5.10.2.1.1, the NPDES permit program regulates point sources that discharge pollutants into waters of the United States. Dischargers whose projects disturb one or more acres of soil are required to obtain coverage under the General Permit for Discharges of Stormwater Associated with Construction Activity, also called the Construction General Permit. The Construction General Permit requires the development and implementation of a SWPPP, which includes BMPs to minimize pollutants in stormwater discharges and comply with the Permit. The LARWQCB administers NPDES permits in the Project Area.

5.19.2.2 State

5.19.2.2.1 California Integrated Waste Management Act of 1989

The California Integrated Waste Management Act of 1989 requires all California cities and counties to implement programs to reduce, recycle, and compost at least 50 percent of their waste. The State determines compliance with this mandate to “divert” 50 percent of generated waste (which includes both disposed of and diverted waste) through a formula that compares a “base year” waste generation rate against which future diversion is measured. The city or county calculates the diversion rate by subtracting the amount of material disposed at landfills annually from the base year amount (PRC Section 41780.2).

5.19.2.2.2 CCR Title 14, Natural Resources – Division 7

CalRecycle, created Jan. 1, 2010 through legislation merging the programs of the former California Integrated Waste Management Board and the beverage container recycling program that was previously managed by the California Department of Conservation, administers and provides oversight for all of California’s state-managed waste handling and recycling programs.

This section of the CCR contains current CalRecycle regulations pertaining to all other non-hazardous waste management in California. Title 14 Chapter 3 Article 5 describes solid waste storage and removal standards that owners and operators of a property must follow, including design requirements for proper storage of waste and timing of removal from the site. Chapter 9.1 mandates recycling for any commercial or public entity that generates four cubic yards or more of commercial solid waste per week.

5.19.2.3 Local

Although Santa Felicia Dam is located in unincorporated Ventura County, it is exempt from local permit and planning requirements because it is a water storage and power generation facility, regulated by a license issued by FERC under the Federal Powers Act. Therefore, the Project is not subject to the provisions of the Ventura County General Plan or related local area plans.

5.19.2.3.1 Ventura County General Plan

The general goals related to public utilities and services outlined in the Ventura County General Plan (Ventura County 2016a) are provided as follows for informational purposes:

1. Plan for public facilities and services which will adequately serve the existing and future residents of the County. (Section 4.1.1)
2. Promote the cost effective operation, equitable distribution, and funding and development of public facilities and services to meet the County's existing and future needs. (Section 4.1.1)
3. Ensure that public facilities and services are consistent with the land use and development goals, policies and programs of the County General Plan. (Section 4.1.1)

5.19.3 Impacts and Mitigation Measures

5.19.3.1 *Significance Criteria*

UWCD reviewed Appendix G of the CEQA Guidelines to determine whether the Project or alternatives would result in significant impacts related to utilities and service systems. The criteria listed below consider if the Project would:

- a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.
- b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental impacts.
- c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
- d. Have sufficient water supplies available to serve the Project from existing entitlements and resources, or are new or expanded entitlements needed.
- e. Result in a determination by the wastewater treatment provider that serves or may serve the Project that it has inadequate capacity to serve the Project's projected demand in addition to the provider's existing commitments.
- f. Be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs.
- g. Comply with Federal, State, and local statutes and regulations related to solid waste.

Portable sanitary facilities would be used by workers during Project construction, and use of restroom facilities at Lake Piru Reservoir or maintenance facilities would remain at current levels during operation because there would not be an increase in personnel. Wastewater produced during Project operations would continue to be disposed of in septic systems, leech fields, and seepage pits. No treatment of wastewater would occur. Therefore, the Project would not require new or expanded water or wastewater treatment facilities or exceed wastewater treatment requirements of the LARWQCB, and criteria a and b are not discussed further.

The Project would not require or result in the construction or expansion of stormwater drainage facilities; therefore, criterion c is not discussed further.

The Project would require water for construction activities including dust suppression, compaction, mixing, and decontamination. This water would be sourced from Lake Piru Reservoir; no new or expanded entitlements would be needed, and criterion d is not discussed further.

The Project would not utilize the Piru Wastewater Treatment Plant, and as such, would have no impacts on its operations; criterion e is therefore not discussed further.

The Project would comply with all Federal, State, and local statutes and regulations related to solid waste; although, as noted above, the Project is exempt from local requirements. The Project would require excavation of soil and rock for spillway modification, access road realignment, and facility construction. Excavated materials would be processed and re-used onsite as structural fill, fill for improvement of existing access roads, or disposed of onsite in a designated spoil area located on the existing downstream toe berm and would not require placement in landfills. Other construction-related debris would require disposal at regional landfills serving the Project. However, debris is expected to be minimal, and the landfills serving the Project area have sufficient capacity (7.2 and 60 million tons for the Toland Road and Chiquita Canyon landfills, respectively) to accommodate the Project's construction solid waste disposal needs. The Toland Road landfill is set to close in nine years, and the Chiquita Canyon landfill is permitted to operate for 30 more years. The Project would not reduce the life of the Chiquita Canyon

landfill to less than 15 years. Therefore, no impacts would occur under criteria f and g and these criteria are not discussed further.

Potential stormwater discharge impacts during construction are discussed in Section 5.10.3.2.

5.19.3.2 Labyrinth Alternative

Operation of this alternative would be the same as that for the Project, and the construction requirements would be similar to the requirements provided for the Project with the exception that the dam crest would not need to be raised and it would involve substantially more demolition and concrete placement. This could lead to a higher water demand and increased waste production; however, the activities would be within the same magnitude of the proposed Project. Accordingly, utility and service system impacts associated with the Labyrinth Alternative would be similar in extent and intensity as those described above for the Project for each significance criteria.

5.19.3.3 No Project Alternative

Under the No Project Alternative, there would be no improvements to the Santa Felicia Dam, spillway, or outlet works system. As such, there would be no impact to utilities and service systems.

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6 CUMULATIVE IMPACTS

This section describes the cumulative impact assessment methodology, projects considered in the cumulative impact assessment, and potential cumulative impacts that would occur if these projects were implemented along with the Santa Felicia Dam Safety Improvement Project. The focus of this analysis is to identify the potential impacts of the Project that might not be significant when considered alone, but that might contribute to a significant impact when viewed in conjunction with the other projects.

6.1 Cumulative Impact Methodology

The CEQA Guidelines Section 15355 define cumulative impacts as follows:

“Cumulative impacts” refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.

(a) The individual effects may be changes resulting from a single project or a number of separate projects.

(b) The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

In addition, CEQA Guidelines Section 15130(a)(1) states:

As defined in Section 15355, a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the Environmental Impact Report (EIR) together with other projects causing related impacts. An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR.

Furthermore, CEQA Guidelines Section 15064(h)(4) states:

The mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project’s incremental effects are cumulatively considerable.

For the purposes of this EIR, significant cumulative impacts would occur if the impacts related to Project implementation, added to the impacts from other past, present, and reasonably foreseeable future projects in the region, would result in a significant impact. Federal, State, and local agencies with planning and regulatory authority in Ventura and Los Angeles Counties were contacted and their websites were reviewed to identify projects that may result in a cumulative impact. These projects then were examined for their potential to result in a cumulative impact when combined with the Project. Projects included in the cumulative impact analysis were identified using a list approach and are those that could result in impacts on the same resources in the same geographic areas as the Project. The primary geographic area that was considered in the cumulative impact analysis is limited to the area in the general vicinity of Santa Felicia Dam or the access roads leading to the dam, although other projects in Ventura and Los Angeles Counties within an approximately 10-mile radius also were included.

6.2 Projects included in the Cumulative Impact Analysis

This section discusses the projects identified by agencies with jurisdiction over development projects physically located in Los Angeles and Ventura Counties in the general vicinity of Santa Felicia Dam.

Projects under UWCD's jurisdiction are described in Section 6.2.1. Projects under the jurisdiction of other agencies are described in Section 6.2.2, Table 6.2-1.

6.2.1 United Water Conservation District Projects

6.2.1.1 *Fish Passage Project*

On September 12, 2008, FERC issued a license (FERC Project P-2153-012) to UWCD for the Santa Felicia Hydroelectric Project. On May 5, 2008, NMFS issued a biological opinion to FERC addressing the effects of the issuance of this license on endangered southern California steelhead. Articles 401 and 402 of the license incorporate requirements contained in the Biological Opinion. Specifically, Element 3 of the RPA 3 in the Biological Opinion requires that UWCD provide passage of steelhead at or around Santa Felicia Dam or other suitable alternatives to passage. UWCD convened an independent panel of fish passage experts to assess the feasibility of fish passage at the Santa Felicia Project. The panel determined that non-volitional passage is feasible and recommended preferred alternatives for both upstream and downstream passage. The panel identified uncertainties related to the biological and engineering feasibility of the preferred alternatives and recommended an implementation process. UWCD has initiated the pre-implementation process recommended by the Panel. UWCD's agreement to pursue fish passage at the Santa Felicia Project is contingent on resolution of certain outstanding issues, including reaching agreement on the biological criteria required in RPA 3(d).

6.2.1.2 *Habitat Improvement Project*

UWCD is in the process of developing a habitat improvement plan to comply with Article 401(a) of the FERC license for UWCD's Santa Felicia Project (FERC Project No. 2153-012) and RPA 1(c) contained in the associated Biological Opinion, dated May 5, 2008, issued by NMFS, for endangered southern California steelhead. RPA 1(c) requires UWCD to implement a habitat improvement plan to minimize the geomorphic effects of Santa Felicia Dam and its operations on the quality and quantity of habitat for steelhead in Piru Creek downstream of the dam (lower Piru Creek).

6.2.1.3 *Quagga Mussel Monitoring and Control Plan*

Quagga mussels (*Dreissena rostriformis bugensis*) were discovered in Lake Piru Reservoir on December 18, 2013. Since their discovery, UWCD has researched, developed, tested, and implemented various monitoring, containment, and control measures to delineate, characterize, and address the infestation. Monitoring activities have included water quality sampling, dive surveys, the use of settling substrates, veliger sampling, and streambed substrate surveys to assess the current extent of the infestation and better understand the potential for quagga mussels to spread to other parts of the Piru Creek and Santa Clara River watersheds. Currently, adult mussels and veligers have been observed throughout Lake Piru Reservoir with hotspots in the northeast and southeast parts of the lake and on human-made infrastructure (i.e., the floating docks, the intake barge for potable water, and the intake structure for the dam), and along lower Piru Creek in the reach situated between the dam release pool downstream to UWCD's property boundary with Rancho Temescal. In 2017, adult quagga mussels were detected along the UWCD-owned reach of lower Piru Creek near its confluence with the Santa Clara River, and along the Santa Clara River downstream of the confluence on the Torrey Road Bridge abutment in August and on the 12th Street Bridge abutments in August, September, and November. However, no quagga mussels were detected at the 12th Street Bridge in December, and no quagga mussels were found at the Peto Property owned and managed by the Nature Conservancy or the Freeman Diversion.

UWCD's approach for containment and control consists of two phases. Phase 1 uses the integrated pest management (IPM) framework to guide monitoring, containment, and control efforts, and Phase 2 consists of complete eradication of quagga mussels from Lake Piru Reservoir and lower Piru Creek. UWCD is currently engaged in Phase I, which consists of cultural, mechanical, physical, and mild chemical measures. UWCD's cultural containment measures involve inspection, tracking, and tagging of

recreational vessels in cooperation with other water management entities; public education; and law enforcement. UWCD has also implemented mild chemical control measures when decontaminating vehicles and equipment that have come into contact with infested waters.

UWCD's mechanical containment and control measures include contracting professional divers to perform mechanical scraping of human-made infrastructure in Lake Piru Reservoir at least four times a year as well as recommissioning Turbine Unit 1 in December 2016 to exert lethal shear stress on veligers during the release of water from Lake Piru Reservoir to Piru Creek through the dam. In addition, when practical, UWCD has operated the lake such that water levels fluctuate to kill adults through desiccation and reduce reproduction. UWCD is currently developing a Lake Piru Reservoir Hydrodynamic and Quagga Population Model to optimize release scenarios and develop a lake level management strategy with the objective of maximizing the mortality of quagga mussels.

UWCD is also working with stakeholders that receive surface water deliveries from the Freeman Diversion, in order to develop an approach to ensure that quagga mussels are not transferred to stakeholder infrastructure. The approach involves infiltrating surface water deliveries through the Saticoy groundwater recharge basins, which will effectively serve as sand filters to remove quagga mussel veligers as the water percolates through the basins. The water will then be pumped out of the groundwater basins using an expanded Saticoy well field.

In regard to eradication, UWCD is proceeding with the planning and permitting process to treat Lake Piru Reservoir with a copper sulfate pentahydrate formulation registered under EarthTecQZ™ to broadly address the current quagga mussel population in Lake Piru Reservoir.

Lastly, UWCD has implemented adaptive management as a decision-making process to identify appropriate changes in control, containment, and monitoring actions. Information collected during the monitoring, containment, and control activities is assessed annually and used to inform and guide appropriate changes, if necessary, to ensure achievement of the goals. To support the adaptive management process, UWCD has formed a Technical Advisory Committee composed of representatives from CDFW, NMFS, USFWS, USDA-FS, County of Ventura Agricultural Commissioner, and California Sea Grant. The Committee assists UWCD in reviewing collected data, evaluating the effectiveness of the proposed containment, control, and monitoring measures, and, if warranted, developing alternative strategies for addressing the infestation.

6.2.2 Projects under the Jurisdiction of other Agencies

Projects under the jurisdiction of agencies other than UWCD are described in Table 6.2-1, along with the status of their environmental analysis and anticipated environmental impacts.

Table 6.2-1 Additional Projects included in the Cumulative Impact Analysis

Project Name	Project Description	Project Environmental Analysis Status and Anticipated Environmental Impacts
California Department of Water Resources (DWR) and Los Angeles Department of Water and Power (LADWP)		
South State Water Project Hydropower Relicensing Project	DWR owns, operates, and maintains Pyramid Dam, which impounds Piru Creek 18 miles upstream of the normal mean water surface elevation of Lake Piru Reservoir. When necessary, DWR performs maintenance of Pyramid Dam and SWP facilities in the immediate vicinity of the dam. DWR operates Pyramid Dam in compliance with the license issued by FERC for South SWP Hydropower (FERC Project Number 2426). DWR and the Los Angeles Department of Water and Power (LADWP) hold this license jointly. Article 52 of the FERC license requires outflows from Pyramid Dam to Piru Creek to match natural inflow into Pyramid Lake to the extent operationally feasible and consistent with safety requirements. FERC license P-2426 expires on January 31, 2022. DWR and LADWP are currently seeking a new license from FERC that would become effective after the current license expires in 2022. DWR is not proposing any new facilities or any changes to its operations, including releases to Piru Creek.	Environmental studies are currently underway for this project. DWR (2017), however, has indicated that it has no present or reasonably foreseeable future projects that could contribute to a cumulative impact in combination with the proposed Project, including the South SWP Hydropower Relicensing Project. All of DWR's planned projects on the downstream (i.e., south) side of Pyramid Dam would be located within about 2 miles of the dam. None would affect the hydrology of Piru Creek or cause environmental effects that would contribute to a cumulative impact in combination with the Santa Felicia Dam Safety Improvement Project.
US Forest Service, Los Padres National Forest (LPNF)¹		
Lower Piru Rangelands	The project is composed of three livestock grazing allotments (Piru, Pothole, and Temescal) near Lake Piru Reservoir in Ventura and Los Angeles Counties, California on both private and USDA-FS lands. The total area of all three allotments is approximately 10,895 acres. Although the eastern portion of the project is within the Angeles National Forest, grazing activities are administered by the LPNF. The LPNF proposes to authorize livestock grazing on suitable USDA-FS lands with these three allotments and incorporating short- and long-term monitoring plans.	The LPNF prepared an Environmental Assessment in 2011 for the Lower Piru Rangelands (LPNF 2011a). Livestock grazing is currently permitted on the Temescal Allotment but grazing on the Pothole and Piru Allotments was prohibited in 2002, until certain conditions are met as identified in the Environmental Assessment. Resources with the potential to be affected by the project include water quality, soils, sensitive species and habitats, cultural resources, and recreation. The LPNF issued a Finding of No Significant Impact in 2011 (LPNF 2011b). The allotments affected by the Lower Piru Rangelands Project are north and west of Lake Piru Reservoir and are not in the vicinity of the dam. The Project is expected to have localized impacts that would not contribute to a significant cumulative impact in combination with those of the Project given the implementation of conditions required by the Environmental Assessment.

¹ No relevant projects were identified in the Angeles National Forest.

Project Name	Project Description	Project Environmental Analysis Status and Anticipated Environmental Impacts
<p>Blue Point Campground and Day Use Removal and Restoration Project</p>	<p>This project is upstream of Lake Piru Reservoir and proposes to remove the campground and day use facilities, streamside revetment and hardened creek crossing.</p> <p>The facilities were closed in 2000 to protect endangered species and their habitats, and were mostly destroyed in the 2008 Ranch Fire. There is now a need to remove damaged recreation facilities to protect public safety. An additional component of the project is the restoration of the riparian and upland habitats associated with Federally listed species. Piru Creek, recommended for Wild and Scenic River designation, runs through the project area.</p>	<p>The Draft Environmental Assessment was issued in September 2017 (LPNF 2017a). If this project is approved, implementation may occur in 2018.</p> <p>The Proposed Action may have short-term effects due to temporary loss of soil cover, disturbance to active stream channels, and temporary flow diversion around the concrete ford removal site, which could increase turbidity. Also, there could be short-term threats to arroyo toads, which might result in incidental take or adverse modification of critical habitat, and to birds nesting on or near the ground that could be susceptible to disturbance during project implementation.</p> <p>The removal of facilities and site restoration would have long-term beneficial effects, such as the creation of more diverse and natural in-channel morphologic features (point bars and pools), a more naturally free-flowing stream channel, and improvement to the riparian vegetation component at the water crossing and along the stream bank. It will also beneficially affect the arroyo toad in the long term by further alleviating recreational pressure in an area of important toad habitat, and by restoring that habitat to a more natural condition, increasing habitat quality and quantity. It is possible there could be a slight improvement in water quality by removing the hardened surfaces and reducing areas of accelerated runoff once these areas have revegetated naturally. Additionally, removal of the outhouses would prevent future use and possible risk to water quality.</p> <p>Resource protection measures have been included in the Environmental Assessment to eliminate or reduce potential impacts on sensitive species and habitats, cultural resources, aesthetics, hydrology, soils, and recreation.</p>
<p>Tamarisk Removal on Piru Creek Upstream of Lake Piru Reservoir</p>	<p>This project is an effort to remove tamarisk, an invasive species, from all watersheds where it occurs within LPNF. Targeted watersheds include Piru Creek, Sespe Creek, Lockwood Creek, Santa Ynez River, Sisquoc River, and Arroyo Seco River. Tamarisk is prolific and has replaced many native riparian trees and also consumes a disproportionate amount of water, reducing surface water available to wildlife. The project will use hand-pulling methods and herbicide application to control the spread of tamarisk within LPNF. Treatments have not yet begun but are expected to occur through 2021. Monitoring and maintenance treatments would continue thereafter to retreat existing</p>	<p>A Final Environmental Impact Statement was issued in September 2016 (LPNF 2016a). The project was approved in November 2016, but it is not currently being implemented. Resources that may potentially be affected by the project are hydrology, heritage resources, biological resources, and special designation areas (wilderness and Wild and Scenic Rivers). Mitigation measures have been identified that will minimize adverse impacts, and benefits to many resources would result from removal of this invasive species.</p>

Project Name	Project Description	Project Environmental Analysis Status and Anticipated Environmental Impacts
	infestations, and to treat new infestations discovered within the project area. It is anticipated that most of the project would be implemented over the next 10 years, with the most intensive treatments occurring during the first years.	
Evaluation and Restoration of Degraded Chaparral within the Piru Fire Perimeter	This project is a scientific study to evaluate the effects of multiple short interval fires within LPNF on degradation of chaparral and spread of invasive species. It consists of twenty 5-meter by 5-meter test plots, established just west of Lake Piru Reservoir, which will be analyzed for various environmental factors, burn history, proximity to roads and grazing lands, and which will undergo some noxious weed removal and seed collection.	This project was subject to a Categorical Exclusion under NEPA (LPNF 2016b). The project was approved and initiated in October 2016; duration of the study was approximately 18 months. This scientific study would be completed before the Santa Felicia Dam Safety Improvement Project began and would not be expected to contribute to any cumulative impacts.
Re-route Pothole Trail, Reconstruct Aqua Blanca Trail, and Routine Maintenance of all District Non-motorized Trails	The LPNF is considering projects to re-route the Pothole Trail, reconstruct the Aqua Blanca Trail, and conduct routine maintenance of all district non-motorized trails.	The LPNF intends to complete separate environmental analyses for each of these actions. No schedule has been established yet, but it is anticipated that impacts would be short-term and localized and would not contribute to a significant cumulative impact in combination with impacts of the Santa Felicia Dam Safety Improvement Project. (LPNF 2017b)
Noxious Weed Control Projects	The first project is a tamarisk biocontrol pilot program that would occur in the Sespe River within the Sespe Wilderness and Condor Sanctuary (outside of the Piru Creek Watershed). The second project is a Forest-wide Noxious Weed Program that would provide an integrated treatment approach and include the Piru Creek watershed. The Program would use an integrated approach that would include biocontrol for tamarisk, if the Pilot Program proves successful. The Forest-wide Program would integrate traditional mechanical and chemical treatments for all invasive and nonnative plants. Forest-wide biocontrol would only be carried out after Pilot Program monitoring is complete, with results that show that biocontrol is a viable, safe option for tamarisk management in LPNF. As tamarisk and other invasive and nonnative species infestations are eradicated, restoration of native vegetation would begin, allowing for progressive treatments and restoration across the Forest, leading to successive ecosystem and habitat improvements Forest-wide.	Public comments have been solicited on these two Environmental Assessments. The tamarisk biocontrol pilot program NEPA analysis is planned to be complete in May 2018. The second Environmental Assessment is planned to be complete in December 2018. Impacts have not been identified as yet, but long-term impacts are expected to be beneficial. (LPNF 2017b)

Project Name	Project Description	Project Environmental Analysis Status and Anticipated Environmental Impacts
Ventura County Planning Division²		
<p>Minor Modification to Conditional Use Permit No. 4268 to allow the continued production, reworking, and maintenance of six oil and gas wells located in the Ramona Oil Field at the eastern edge of the County of Ventura for an additional 30-year term (Ventura County Planning Division Case No. PL15-0001)</p>	<p>This project is a Minor Modification to Conditional Use Permit 4268 to allow the continued production, reworking, and maintenance of six oil and gas wells located in the Ramona Oil Field at the eastern edge of the County of Ventura adjacent to the Los Angeles County line for an additional 30-year term. The facility was originally approved in 1985 and is located in the OS-160 min ac Zone District and the Open Space General Plan land use designation. In addition to modifying the term of the entitlement, Condition No. 2, the applicant has removed the tank farm that was originally approved at the production site and is now transporting the oil from the wells in an above ground two-inch pipe, rated for 5,000 lbs., to a tank battery he controls on an adjacent lease in Los Angeles County. No additional grading or drilling, beyond for maintenance purposes, is proposed. No additional ground disturbance is proposed as the facility is already developed in accordance with the terms of the original conditional use permit. No hydraulic fracturing will be used in the maintenance or production at this facility.</p>	<p>This project is not anticipated to have any environmental impacts that would contribute to an environmental impact in combination with impacts of the Santa Felicia Dam Safety Improvement Project because there would be no change to the existing facilities and infrastructure and no changes to the normal operation and maintenance of the wells would occur. The applicant has recommended the project be categorically exempt from environmental review pursuant to Section 15301 of the CEQA guidelines.</p>
<p>Permit Adjustment to extend the entitlement phase for an existing Planned Development Permit for the construction of an affordable 24-unit multi-family development (Ventura County Planning Division Case No. PL17-0010)</p>	<p>This project is a Permit Adjustment to extend the entitlement phase for Planned Development Permit for the construction of an affordable 24-unit multi-family development on a 1.38-acre property in the RPD-12 dwelling unit (du)/acre zone located at 4072 Center Street (APN 056-0-113-050) in Fillmore within the Residential 10-15 du/ac Piru Area Plan land use designation and the Urban General Plan land use designation. The proposed development consists of three residential buildings of 5,253 sq. ft. each housing eight rental units apiece. In addition to the residential buildings a 1,390 sq. ft. community building is proposed. Access to the site would be provided by a 24-ft wide private driveway via Center Street on the north side of property with a 24-ft wide access driveway via Market Street to the south. Both driveways lead to disconnected parking areas that are separated by the proposed community center and associated common area. 46 parking spaces are provided on-site in the two parking lot areas. No native vegetation would be removed, although six heritage-sized pepper trees would be felled. Water is provided by Warring Water Service Inc. and wastewater</p>	<p>This project was approved in March 2017. It is anticipated that construction would be completed by the time construction of the Santa Felicia Dam Safety Improvement Project began. If construction were delayed, it is anticipated that impacts would be temporary and cease upon the completion of construction due to its location in a developed urban area. Additionally, with the exception of potential minor increases in traffic on State Route 126, which will be considered further, this project is not expected to affect the same resources as the Santa Felicia Dam Safety Improvement Project due to its urban location nearly 10 miles from the dam site. Therefore, this project is not expected to contribute to significant cumulative impacts in combination with those of the Santa Felicia Dam Safety Improvement Project.</p>

² Source for Ventura County Projects is Ventura County Resource Management Area 2017b.

Project Name	Project Description	Project Environmental Analysis Status and Anticipated Environmental Impacts
	<p>disposal is provided by Ventura County Sanitary District No. 16. The landscape plan for the project illustrates a vegetative screening between the residential project and the adjacent agricultural operation as a modified buffer. By being 100% affordable, the 1.38-acre project qualifies for a density bonus pursuant California Government Code §65915-65918. The density bonus is part of the formal request in order to bring the project density over the 15 du/acre land designation to 17 du/acre. The request includes a Voluntary Lot Merger (Parcel Map Waiver) to merger the three legal lots that are part of the project.</p>	
<p>Permit Adjustment to Conditional Use Permit PL13-0110 to put on line a replacement well (Well #5) and to abandon existing Well #1 for the Warring Water Company. (Ventura County Planning Division Case No. PL17-0040)</p>	<p>Warring Water Services, Inc., water distribution system is located approximately 30 miles east of Ventura, California, in the community of Piru. The water system is located adjacent to the Piru Creek and slightly sloped to the southeast. To the south of Piru lies the Santa Clara River. Water to the Warring Water Services distribution system is supplied by three water wells (Wells 1, 2 & 4). All three wells are located south of the intersection of Camulos Street and Church Street. Well 1 has a 75-hp motor and a 500-gpm well pump. Well 2 includes a 60-hp motor and a 200-gpm well pump (Currently out of service for repairs). Both of these wells were constructed in the 1920s. Well 4 was constructed in 2003 and has a 150-hp motor and a 1500-gpm pump.</p> <p>Piru is composed primarily of residential water users and agricultural water users. Only a small portion of its water supply is used for commercial and industrial purposes. The current population of the water consumption area is 2,100 people, representing 485 active domestic connections and 12 commercial and irrigation connections. All three wells are chlorinated using sodium hypochlorite. The groundwater supply source is designated as the Piru Basin, and is recharged by the runoff from Piru Creek and Santa Clara River in addition to the Piru Recharge Spreading Basin. This basin is part of the AB3030 Groundwater Management Plan which is overseen by the Groundwater Management Council.</p> <p>The distribution system is comprised of 5,170 linear feet (LF) of 12-inch PVC pipe, 13,900 LF of 10 PVC pipe, 16,325 LF of 8-inch asbestos-cement pipe (ACP), 9,100 LF of 6-inch ACP, 11,600 LF of 4-inch ACP, 6,200 LF of 3-inch PVC & ACP pipe and 2,700 LF of pipelines under 2-inch in size. The existing</p>	<p>Because the project consists of abandoning one well and replacing it with an equivalent well, the County of Ventura determined that the project was categorically exempt from environmental review. The project is expected to commence in late 2017. As indicated by the Categorical Exemption, this project is not expected to have impacts on the environment that would contribute to significant cumulative impacts in combination with the impacts of the Santa Felicia Dam Safety Improvement Project.</p>

Project Name	Project Description	Project Environmental Analysis Status and Anticipated Environmental Impacts
	<p>distribution system was constructed in phases between 1958 and 1965 with additional main line installations in 1990, 1995, 1999, 2003 & 2009. Water from the wells is discharged into a 1.1 million-gallon steel storage tank (total volume) located on north of Center street along Warring Wash Road below the Ventura County Watershed Protection District's Debris Basin. The tank is protected by a chain link fence with a locked gate. The elevation of the reservoir is adequate to provide all customers with a minimum static pressure of 20 psi.</p> <p>The water storage reservoir can adequately supply water for the fire protection based on a 1,7500 gpm, two-hour duration fire flow (180,000 gallons) along with meeting the maximum day demand for all of our domestic customers. An emergency generator was added to the system in 2011 to allow for continued operation during power outages. Water records for 2012 show that residential demand accounted for approximately 36%, commercial accounted for 8%, and irrigation accounted for 56% of the water consumed. The goal of Warring Water Service is to keep the percentage of water lost below 10%.</p>	
<p>Conditional Use Permit for a large agricultural sales facility accessory to a wholesale nursery located on a 17.28-acre property. (Ventura County Planning Division Case No. PL16-0128)</p>	<p>This project would be located at 3806 Telegraph Road in Fillmore and includes a Conditional Use Permit for a large agricultural sales facility accessory to a wholesale nursery located on a 17.28-acre property with the Agricultural 40-acre minimum Zone District and the Agricultural General Plan land use designation. The applicant is proposing a 1,440 square foot commercial coach to be used as an office and sales display area. The project includes eight onsite parking spaces. The majority of the property is used for landscape plant production. Water to the commercial coach is proposed to be provided by an existing offset water well (CA Well No. 04N18W29M01S) through a shared well agreement. Agricultural water for the nursery production is provided by an existing service connection from Pacific Avenue Water Company.</p> <p>After the initial submittal, the applicant requested to add 560 square feet of outdoor sales and display area adjacent to the commercial coach.</p>	<p>An Initial Study was prepared and posted for public review in August 2017. Resources that may be affected as a result of the project include traffic (increased traffic and/or congestion from State Route 126 entrance), land use (commercial facility located on land zoned for agriculture), and aesthetics (visual obstruction of coach in otherwise agricultural landscape).</p> <p>The potential for increased traffic to contribute to a significant environmental impact will be considered further. Other impacts are localized and would not affect the same resources as the Santa Felicia Dam Safety Improvement Project and thus would not contribute to a significant cumulative impact in combination with the Project's impacts.</p>
<p>Entitlement project: Parcel Map Waiver-Lot Line Adjustment, 2 lots Normans Nursery,</p>	<p>This project would be located at 126 Hopper Canyon Fire Road in Fillmore and includes a Parcel Map Waiver- Lot Line Adjustment for two lots at Normans Nursery, Fillmore.</p>	<p>This project is tentatively approved. As a ministerial project it is not subject to CEQA. It is therefore not anticipated to result in environmental impacts and thus would not contribute to a</p>

Project Name	Project Description	Project Environmental Analysis Status and Anticipated Environmental Impacts
Fillmore (Ventura County Planning Division Case No. PL13-0093)		significant cumulative impact in combination with the Project's impacts.
Entitlement project: Conditional Use Permit for the continued use of Bennett's Honey Farm at 3176 Honey Lane in Fillmore for a Large Agricultural Sales Facility to abate violation CV15-0384. (Ventura County Planning Division Case No. PL16-0096)	<p>The project is issuance of a Conditional Use Permit for the continued use of Bennett's Honey Farm at 3176 Honey Lane in Fillmore for a Large Ag Sales Facility to abate violation CV15-0384. It would result in increased allowed lot coverage.</p> <p>The proposal for Bennett's Honey Farm is to continue the Agricultural apiary use and operating procedures exactly as has existed now for over a decade, using the CUP processes considering the following two CUP issues/processes.</p> <p>Bennett's is currently using cargo containers for storage located throughout the project area, and hereby will align the containers consistent with current codes and in a uniform manner and location. The project proposes to use a steel storage barn for hive/box storage to replace the two hoop structures currently being used for this purpose. Conditions also would be placed on the types of sales inventory that could be sold.</p>	<p>A Negative Declaration was issued in December 2017 (Ventura County Resource Management Agency 2017c). Impacts were either classified as No Impact or Less than Significant Impact. The project would result in an increase of 56 average daily trips on State Route 126. To address the cumulative adverse impacts of traffic on the Regional Road Network, Ventura County Traffic Impact Mitigation Fee Ordinance 4246 and General Plan Policy 4.2.2 require that the Transportation Department of the Public Works Agency collect this fee from development. This development is subject to this Ordinance. The potential for cumulative impacts from this increase will be addressed further. Other less than significant impacts would be localized and affect different resources than the Santa Felicia Dam Safety Improvement Project, which is located approximately 10 miles away. Thus, with the potential exception of traffic increases, this project would not contribute to a significant impact in combination with the impacts of the Santa Felicia Dam Safety Improvement Project.</p>
Sanitation Districts of Los Angeles County		
Santa Clarita Valley Sanitation District Chloride Compliance Project and Recycled Water Project and Chloride Compliance Project	<p>This project investigates the most cost-effective and environmentally sound solution to meet the State-mandated chloride limit in treated wastewater in the Santa Clarita Valley. There are two wastewater treatment plants, neither of which is designed to remove chloride. The project proposes to install new equipment at one of the treatment plants (Valencia Water Reclamation Plant), by which chloride will be removed from water as a concentrated salt solution (brine) using reverse osmosis. The brine will need to be properly disposed of. The 2013 EIR included a project component to reduce discharge of recycled water to the Santa Clara River so that the water could be used in the community instead; this "Recycled Water Project" component was removed from the 2016 EIR to conduct a separate CEQA analysis. The Valencia Water Reclamation Plant is located in the City of Santa Clarita in Los Angeles County, between I-5 and the Santa Clara River; brine will be disposed of by loading containers onto trucks and driving them south via I-5</p>	<p>An EIR for the project was released in 2013 (LACSD 2013), which was approved. A supplemental EIR was prepared in 2016 (LACSD 2016) to address environmental impacts of the management and disposal of the brine produced as a byproduct of the chloride removal process. Also in 2016, the original 2013 EIR was ruled as inadequate for issues relating to unarmored threespine stickleback (impacts from reduced discharge under the Recycled Water Project) and the perceived incompleteness of the original chloride compliance plan. In response, the Recycled Water Project was removed from the EIR to be addressed in a separate analysis, and the EIR was recirculated in 2016 and finalized in 2017 (LACSD 2017a, 2017b). The Chloride Compliance and Recycled Water Projects could result in significant impacts, which would be reduced to less-than-significant with mitigation, affecting the following resources: air quality (violation of air quality standards from construction equipment emissions); biological resources (direct or indirect</p>

Project Name	Project Description	Project Environmental Analysis Status and Anticipated Environmental Impacts
	and I-405 down to the Joint Water Pollution Control Plant in Carson, California, also in Los Angeles County.(LACSD 2013)	impacts on special-status species); cultural resources (impacts on buried artifacts or cultural sites during ground-disturbing activities); and noise (temporary increase in ambient noise levels during construction activities). Air quality impacts from construction would be temporary, as would impacts of the Santa Felicia Dam Safety Improvement Project; therefore, cumulative impacts would be less than significant as discussed in Section 6.3 below. Noise impacts would be localized and would not affect the same receptors as those of the Santa Felicia Dam Safety Project; therefore, no cumulative noise impacts would occur. The potential for significant cumulative impacts on biological and cultural resources will be discussed in Section 6.3.
Los Angeles County Department of Regional Planning		
Chiquita Canyon Landfill Master Plan Revision	This project is the expansion and continued operation of an existing municipal solid waste facility near the City of Santa Clarita, just west of the intersection of Interstate 5 (I-5) and SR-126. It currently has an existing permitted waste footprint of approximately 257 acres. The project includes development of a new entrance and support facilities; better utilization of the landfill's potential disposal capacity through a lateral extension of the existing waste footprint and increased maximum elevation; continued operation of the landfill; new design features; environmental monitoring; development of a Household Hazardous Waste Facility; mixed organics composting operation; and set-aside of land for potential future conversion technology. Additionally, a portion of Southern California Edison's existing subtransmission line will be relocated in order to accommodate landfill improvements.	A Draft EIR for the project was released for review in in July 2014. Subsequently, a partially recirculated Draft EIR was prepared and finalized in 2017 (Los Angeles County 2017). The project would result in a variety of potentially significant impacts, which would be mitigated to less-than-significant levels. Resources that may be affected by this project include geology and hydrogeology (potential for seismically related ground failure and landslides, soil erosion, debris flows, interference with groundwater recharge); hydrology (alteration of surface water drainage, flooding, increase in runoff that exceeds drainage system capacity); water quality (contamination of surface and groundwater); biological resources (loss of native vegetation, introduction of noxious weeds, impacts on CDFW and USACE jurisdictional waters, impacts on special-status wildlife species and their habitat, introduction of nuisance wildlife); cultural and paleontological resources (grading and construction activities could disturb buried archaeological articles); traffic and transportation (temporary exceedance of LOS standards); air quality (temporary exceedance of daily emission thresholds); and greenhouse gas emissions (exceedance of GHG emissions thresholds). The potential for cumulative impacts will be addressed in Section 6.3.
Landmark Village	Landmark Village is one of five villages within the Newhall Ranch Specific Plan, a large-scale mixed-used community located in unincorporated Los Angeles County. The Newhall Ranch Specific Plan was approved by the Angeles County board of supervisors in 2003. Landmark village consists of 422 lots with a maximum of 1,444 residential units; 1,033,000 sf of non-	A Draft EIR was released in November 2006, and the final EIR was released November 2007. The project was approved in January 2008, but the applicant did not immediately proceed with the project. In July 2009, the applicant began working with Los Angeles County to update their environmental review, resulting in a Recirculated Draft EIR in January 2010. In September 2011, a

Project Name	Project Description	Project Environmental Analysis Status and Anticipated Environmental Impacts
	<p>residential mixed use space; elementary school; community park; fire station; three private recreational facilities; open space; river trail uses; road and infrastructure improvements; and other amenities. The project site is currently used for agricultural purposes and contains miscellaneous, ancillary sheds for agricultural storage, and dirt roads.</p>	<p>Revised Final EIR was released (Los Angeles County 2011). Further revisions to the EIR were made in 2016 and it was again recirculated, in response to two separate litigation cases concerning mitigation for greenhouse gas emissions and the State endangered and fully-protected unarmored threespine stickleback. The Revised Final EIR is still under review. The project would result in potentially significant impacts, some of which would be mitigated to less-than-significant, including: geology and soils (presence of expansive, corrosive, and low cohesion soils, high water tables would need dewatering, landslide potential at the Edison access road grading site); hydrology (discharge of construction-related sediment to the Santa Clara River); water quality (discharge of urban pollutants to the Santa Clara River [including nutrients, heavy metals, hydrocarbons, trash and debris]); biological resources (loss of native vegetative communities and wetlands, direct and indirect impact to special-status wildlife and plant species, loss or degradation of habitat for special-status species [significant unavoidable impacts]); floodplain modifications (infilling a portion of the floodplain so that the entire project area is above the 100-year flood hazard zone would lead to loss of vegetation communities and potential impacts to special-status species and water quality); aesthetics (conversion of agricultural landscape to commercial and residential [significant unavoidable impact]); traffic (temporary increase in local traffic conditions during construction and permanent increase locally and on I-5 and SR-126 once construction is completed); noise (temporary noise increase during construction activities, permanent noise increase with increased traffic on highways and new public parks [potentially unavoidable significant impacts]); air quality (increased emissions during both construction and operation [unavoidable significant impact]); public services (increased need for wastewater and solid waste disposal [significant unavoidable impact], law enforcement and fire and emergency services, and educational and library facilities); land use (conversion of agricultural land to commercial and residential [unavoidable significant impact]); utilities (increased demand for electricity); mineral resources (the project site is located within an MRZ-2 zone, indicating that the area has significant mineral deposits present which will be difficult to access following completion of the project); hazards and hazardous materials (soil or groundwater contamination during construction activities, disposal of</p>

Project Name	Project Description	Project Environmental Analysis Status and Anticipated Environmental Impacts
		hazardous wastes generated during construction); cultural and paleontological resources (grading could damage buried artifacts and fossils); and greenhouse gas emissions (increased emissions during construction activities and project operation). The potential for cumulative impacts will be discussed in Section 6.3.
Mission Village	Mission Village is one of five villages within the Newhall Ranch Specific plan, a large-scale mixed use community located in unincorporated LA County. The Newhall Ranch Specific plan was approved by the LA County Board of Supervisors in 2003. Mission Village would accommodate 4,055 homes and 1,555,100 sf of commercial uses. The project would also include an elementary school, library, fire station, bus transfer station, and open space. Mission Village would further include supporting facilities and infrastructure, including roads, the commerce center drive bridge, trails, drainage improvements, flood protection, potable and recycled water systems, sanitary sewer system, and dry utilities systems.	A Draft EIR was released in October 2010 (Los Angeles County 2010) and the final EIR was released in May 2011. The project was approved in February 2012. Portions of the EIR were revised and recirculated in November 2016 (Los Angeles County 2016) in response to two separate litigation cases concerning mitigation for greenhouse gas emissions and the State endangered and fully protected unarmored threespine stickleback. As of January 2017, the Revised Final EIR is still under review. The project would result in potentially significant impacts, some of which would be mitigated to less-than-significant, including: geology and soils (potential ground rupture along fault lines, landslide potential at numerous locations, presence of expansive and corrosive soils could lead to structural instability); hydrology (discharge of construction-related sediment to the Santa Clara River); biological resources (loss of native vegetative communities and wetlands, direct and indirect impact to special-status wildlife and plant species, loss or degradation of habitat for special-status species); aesthetics (conversion of agricultural landscape to commercial and residential [significant unavoidable impact]); traffic (temporary increase in local traffic conditions during construction and permanent increase locally and at freeway ramps once construction is completed); noise (temporary noise increase during construction activities, permanent noise increase with increased traffic on parkways, exposure of new dwellings to noise from Magic Mountain theme park); air quality (increased emissions during both construction and operation [unavoidable significant impact]); public services (increased need for wastewater and solid waste disposal [significant unavoidable impact], law enforcement and fire and emergency services, and educational and library facilities); land use (conversion of agricultural land to commercial and residential [unavoidable significant impact]); utilities (increased demand for electricity); mineral resources (the project site is located within MRZ-2 and MRZ-3 zones, indicating that the area has significant mineral deposits present or that mineral deposits are expected but unknown, respectively, which will be difficult to access following

Project Name	Project Description	Project Environmental Analysis Status and Anticipated Environmental Impacts
		completion of the project); hazards and hazardous materials (soil or groundwater contamination during construction activities or from on-site oil and gas activities, disposal of hazardous wastes generated during construction); cultural and paleontological resources (grading could damage buried artifacts and fossils); floodplain modifications (installation of bridge across Santa Clara river could affect hydrology and water flows); water quality (discharge of urban pollutants to the Santa Clara River [including nutrients, heavy metals, hydrocarbons, trash and debris]); and greenhouse gas emissions (increased emissions during construction activities and project operation). The potential for cumulative impacts will be discussed in Section 6.3.
Bouquet Canyon Creek Restoration Project	The primary purpose of this project is to restore habitat in Bouquet Canyon Creek. An important component of this restoration is reestablishing the creek's flow pattern and flow-carrying capacity such that the now-dry reaches of the creek can again receive water. Reestablishing creek flows to the southern end of Bouquet Canyon would potentially increase fish habitat and replenish the groundwater wells of residents downstream of the project site. The flow pattern reestablishment would also prevent flow impacts on Bouquet Canyon Road during reservoir releases and during many storm events. Potential project activities may include; sediment removal, stream channel recontouring, establishment of native plant communities, bioengineered stabilization structures, and development of in-channel habitat structures. In August 2016, a draft CEQA document for the project was released for public review. At that time, the project involved restoration of six pre-defined project areas. In response to comments received during the public review period, the proposed restoration has been expanded to a continuous 8-mile reach to provide a more holistic solution. The project would be located within an unincorporated area of northern LA County and within the southern part of the Santa Clara portion of the US Forest Services Santa Clara/Mojave Rivers Rangers District of the Angeles National Forest.	Environmental impact analysis is expected to be initiated in the fall of 2018. The Mitigated Negative Declaration for the project prepared in 2016 (Los Angeles County Department of Public Works 2016) found that the project would result in potentially significant impacts, which would be mitigated to less-than-significant, including: biological resources (indirect or direct impacts on special-status wildlife species known to inhabit the project area, loss of habitat for sensitive-status species, impacts on sensitive natural communities and wetlands) and cultural resources (direct impacts on buried artifacts or culturally significant sites during ground-disturbing activities). It is anticipated that the updated analysis would result in similar impact determinations, and the potential for cumulative impacts will be discussed in Section 6.3.

6.3 Analysis of Cumulative Impacts by Resource

6.3.1 Aesthetics

As discussed in Section 5.2.1, the Santa Felicia Dam Safety Improvement Project would result in less than significant impacts on aesthetic resources in the immediate vicinity of the dam from construction activities and less than significant impacts from modifications to the dam structures. No other projects included in Section 6.2 would affect aesthetic resources in the same viewshed; therefore, no cumulative impacts would occur.

6.3.2 Agricultural and Forestry Resources

As discussed in Section 5.3.3, the Santa Felicia Dam Safety Improvement Project would not affect agricultural resources; therefore, no cumulative impacts would occur.

6.3.3 Air Quality

As discussed in Section 5.4.3, the only impacts on air quality from the Santa Felicia Dam Safety Improvement Project would be temporary, resulting from construction activities. The VCAQAG indicates that construction-related emissions of the ozone precursors, ROC and NO_x, are not counted towards the 25 pounds per day significance threshold that the VCAPCD has determined will individually and cumulatively jeopardize attainment of the Federal 1-hour ozone standard, and thus have a significant adverse impact on air quality in Ventura County because these emissions are temporary. The VCAPCD also requires that all projects mitigate fugitive dust emissions during construction, thereby mitigating cumulative impacts.

The VCAQAG (VCAPCD 2003) notes that a project that is determined to be inconsistent with the AQMP is also determined to have a significant cumulative adverse air quality impact. The Project would not conflict with or obstruct implementation of the Ventura County AQMP because it would not result in a population increase and would not result in long-term increases in criteria pollutant emissions. Therefore, the Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment, and any cumulative impacts would be less than significant.

6.3.4 Biological Resources

As discussed in Section 5.5.3, UWCD would implement a number of measures during construction to protect biological resources, thus ensuring that construction-related impacts would be less than significant and minimizing the potential for the Project to make a considerable contribution to significant cumulative impacts. The Santa Felicia Dam Safety Improvement Project would create no impacts on biological resources during operations. Other projects in the area would have varying degrees of impacts on biological resources. UWCD's Fish Passage Project and Habitat Improvement Project would ultimately have beneficial impacts on biological resources, as would controlling and potentially eradicating quagga mussels under the Quagga Mussel Monitoring and Control Plan. Thus, no adverse cumulative impacts would result from implementation of UWCD's projects. Several of the projects in the LPNF have the potential to adversely affect biological resources, but measures have been incorporated into the environmental compliance documents that would avoid or minimize such impacts, thereby reducing the potential for significant cumulative impacts. The Ventura County projects would not affect biological resources and would not result in cumulative impacts in combination with those of the Santa Felicia Dam Project. The projects proposed by the Sanitation Districts of Los Angeles County would have significant impacts on biological resources, including special-status species, as would the projects under the jurisdiction of Los Angeles County Department of Regional Planning. These impacts would be cumulatively significant. Although the Santa Felicia Dam Project would also affect biological resources in the same general vicinity, given the BMPs and other measures that would be implemented by UWCD to reduce or avoid impacts (e.g., pre-construction surveys, detailed tree inventory, revegetation and

restoration plan, protection of nesting birds, and other construction practices), the Project's contribution would not be cumulatively considerable and thus would be less than significant.

6.3.5 Cultural Resources

As discussed in Section 5.6.3, Santa Felicia Dam Safety Project construction could result in the destruction of or damage to presently undocumented cultural resources, Project ground-disturbing activities could encounter presently undocumented human remains, and Project ground-disturbing activities could encounter unique paleontological resources, which would be significant impacts. A number of other projects described in Section 6.2 also have the potential to affect known and unknown prehistoric resources. Thus, the cumulative impact on cultural resources in the Project area would be significant, and the Project's contribution would be cumulatively considerable and thus significant. Mitigation measures have been identified in this EIR that would reduce residual the impacts of Santa Felicia Dam Safety Improvement Project to less than significant; similar measures would be required for other projects as part of their environmental review process. No additional mitigation for the Project is required.

6.3.6 Geology and Soils

As discussed in Section 5.7.3, the Santa Felicia Dam Safety Project would result in less than significant impacts on geology and soils during construction (e.g., from seismic risks, erosion, soil instability) and beneficial impacts during operations. The engineering design would incorporate design features that are specific to the geologic conditions at the Project site, and BMPs would be implemented during construction that would minimize the potential for offsite impacts. A number of the projects that would occur in the LPNF would also have impacts on geology and soils along Piru Creek (e.g., erosion and sedimentation) due to activities such as construction and vegetation removal. These projects would be required to implement measures to minimize impacts as well. Other projects would not affect geology and soils in the Project area due to the distances involved. Thus, cumulative impacts would be less than significant.

6.3.7 Greenhouse Gas Emissions

As discussed in Section 5.8.3, greenhouse gas emissions generated by the Santa Felicia Dam Safety Improvement Project would be well under the significance threshold of 10,000 metric tons of CO_{2e}; moreover, emissions would cease being generated once construction ends. Other projects also would generate greenhouse emissions at varying amounts, depending on the size and nature of the project, but the actual levels are not yet available. Although the cumulative impact could be significant, the Project's contribution would not be cumulatively considerable and is less than significant.

6.3.8 Hazards and Hazardous Materials

As discussed in Section 5.9.3, the types of hazards that could occur from implementation of the Santa Felicia Dam Safety Improvement Project would be common to construction projects (e.g., accidental releases of hazardous materials; potential for encountering subsurface structures, such as pipelines or unknown/undetected storage tanks, or materials resulting in a release of contaminants such as lead, asbestos, pesticides, or fuel that may be associated with past uses; and increased risk of fire). Other projects likely would result in similar impacts. These impacts generally would be localized and site-specific and would not combine with impacts of other projects. Moreover, like the Santa Felicia Dam Safety Improvement Project, other projects would be required to comply with applicable regulations. Accordingly, no cumulative impacts would occur.

6.3.9 Hydrology and Water Quality

As discussed in Section 5.10.3, although the Santa Felicia Dam Safety Improvement Project would have a beneficial impact on flooding during operations, it would result in less than significant impacts on

hydrology and water quality during construction (e.g., from erosion and sedimentation, or accidental releases of hazardous materials). The Santa Felicia Dam Safety Improvement Project operations also would have significant but mitigable impacts associated with operation of the new outlet works system because it would alter the existing drainage pattern downstream of Santa Felicia Dam and has the potential to result in a significant but mitigable impact through substantial erosion, siltation, or flooding. A number of the projects that would occur in the LPNF would also have hydrology and water quality impacts along Piru Creek (e.g., erosion and sedimentation) due to activities such as construction and vegetation removal. UWCD's habitat improvement plan would provide beneficial impacts along lower Piru Creek by adding aquatic habitat cover and complexity and reducing erosion along adjacent streambanks. Other projects would not affect hydrology and water quality in the Project area due to the distances involved. Best Management Practices would be implemented during construction of the Santa Felicia Dam Safety Improvement Project that would minimize the potential for offsite impacts, and similar measures would be required for the projects in the LPNF. Mitigation would be required for Santa Felicia Dam's significant impact associated with operation of the outlet works, but no other projects would adversely affect hydrology and water quality downstream of the dam. Thus, cumulative impacts on hydrology and water quality would be less than significant.

6.3.10 Land Use and Planning

As discussed in Section 5.11.3, the Santa Felicia Dam Safety Improvement Project would have no impacts on land use and planning; therefore, no cumulative impacts would occur.

6.3.11 Mineral Resources

As discussed in Section 5.12.3, the Santa Felicia Dam Safety Improvement Project would have no impacts on mineral resources; therefore, no cumulative impacts would occur.

6.3.12 Noise

As discussed in Section 5.13.3, the Santa Felicia Dam Safety Improvement Project would result in significant impacts on noise from truck traffic in the town of Piru and from construction activities at the Project site. No other projects identified in Section 6.2 would increase noise in these areas, and noise impacts are highly localized because noise dissipates rapidly. Therefore, no cumulative impacts on noise would occur.

6.3.13 Population and Housing

As discussed in Section 5.14.3, the Santa Felicia Dam Safety Improvement Project would have no impacts on population and housing; therefore, **no cumulative impacts** would occur.

6.3.14 Public Services

As discussed in Section 5.15.3, construction of the Santa Felicia Dam Safety Improvement Project would result in less than significant impacts on acceptable service ratios, response times or other performance objectives of police and fire protection services due to increased traffic on Piru Canyon Road and increased potential for emergencies. Mitigation is provided to further minimize impacts. No other projects were identified that would affect emergency response times on Piru Canyon Road. Given the relatively low and temporary traffic volume increase, the Project's contribution to a significant cumulative impact would not be cumulatively considerable and cumulative impacts would be less than significant.

6.3.15 Recreation

As discussed in Section 5.16.3, water levels in Lake Piru Reservoir would be lowered to 950 feet msl or lower during construction of the Santa Felicia Dam Safety Improvement Project, which would create a significant and unavoidable impact on recreational activities at Lake Piru Reservoir. No other projects would adversely affect recreational activities at Lake Piru Reservoir or in the surrounding area, and

certain projects in the LPNF (Re-route Pothole Trail, Reconstruct Aqua Blanca Trail, and Routine Maintenance of all District Non-motorized Trails) are designed to improve recreational facilities in the area. Therefore, no cumulative impacts would occur.

6.3.16 Transportation and Traffic

As discussed in Section 5.17.3, the Santa Felicia Dam Safety Improvement Project would result in increased traffic along Piru Canyon Road and State Route 126, but the increase is less than significant. Mitigation is provided to further minimize impacts. No other projects were identified that would affect traffic on Piru Canyon Road. Other projects could add traffic to State Route 126, which is a heavily traveled road. In 2016, annual average daily traffic along State Route 126 in Santa Clarita was 159,000 vehicles; in Ventura it was 128,000 vehicles. Given the relatively low and temporary traffic volume increase, the Project's contribution to a significant cumulative impact would not be cumulatively considerable and cumulative impacts would be less than significant.

6.3.17 Tribal Cultural Resources

As discussed in Section 5.18.3, the Santa Felicia Dam Safety Improvement Project would not result in any impacts on known tribal cultural resources; therefore, no cumulative impacts would occur.

6.3.18 Utilities and Service Systems

As discussed in Section 5.19.3, the Santa Felicia Dam Safety Improvement Project would not result in any impacts on utilities and service systems; therefore, no cumulative impacts would occur.

7 OTHER CEQA CONCERNS

7.1 Growth-Inducing Impacts

This section presents an analysis of the potential growth-inducing effects of the proposed Project and alternatives. A project would directly induce growth if it involves the construction of new housing and would indirectly induce growth if it results in substantial increases in short-term employment, which stimulates the need for additional housing and services; substantial new permanent employment opportunities; or removal of an obstacle to growth and development, such as removing a constraint on a public service. Increased growth may lead to other impacts including increased demand for utilities and public services, increased traffic and noise, air or water quality degradation, and habitat loss or degradation.

Growth and development in the vicinity of the Project area are controlled by the Ventura County government through the Ventura County General Plan and Piru Area Plan, which guide the distribution, general location, and land uses pertaining to housing, businesses, industry, open space, agriculture, and community facilities within the unincorporated area of Ventura County surrounding the town of Piru.

The proposed Project would increase dam safety and minimize impacts that would result from an emergency release and flooding; it is not expected to encourage additional population growth and development. The proposed Project and alternatives would not contribute directly or indirectly to population or economic growth as no additional housing or businesses would be built; construction workers would be employed short-term, hired from the Project area, and commute to the Project site; and there would be no new permanent employment opportunities. Any future local growth would be consistent with the Piru Area Plan.

7.2 Energy Use

Appendix F of the CEQA Guidelines requires that energy implications of a project be considered in an EIR, with particular emphasis on avoiding or reducing the inefficient, wasteful, and unnecessary consumption of energy. As such, this discussion considers the proposed Project's consumption of energy resources, particularly transportation fuels, during the project's construction and operational phases.

Construction of the proposed Project would consume energy through the operation of off-road equipment, trucks (22-27 trips per day), and worker trips (64-84 trips per day). As noted in Section 5.4, Air Quality, construction trucks and equipment would be powered by ultralow sulfur diesel. Vehicle idling would be minimized in accordance with the Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling (Title 13, Division 3, Chapter 10, Section 2435), which limits the idling of diesel-fueled commercial motor vehicles with gross vehicular weight ratings of greater than 10,000 pounds that are licensed for operation on highways. Reducing idling of diesel-fueled vehicles reduces the amount of diesel used by the vehicle. Adherence to local, State, and Federal regulations would reduce short-term fuel demand caused by construction vehicles.

Santa Felicia Dam provides power to a hydroelectric plant with a capacity of approximately 1,454 kW. As part of the proposed Project, a new plant with a similar capacity would be built but with greater power generation efficiency and reliability. No natural gas would be used during Project construction.

Materials excavated during construction would be re-used onsite as fill, and any other construction debris would be recycled or disposed of at local landfills as described in Section 3 and Section 5.19, Utilities and Service Systems. Construction activities would have the objective of enhancing public safety and would have the noted provisions so as not to result in inefficient or wasteful use of energy.

Further, without implementation of the proposed Project, there is potential for significant flooding, and the resulting emergency and reconstruction efforts could utilize more energy than that needed for construction of the Project. A large volume of debris would result from a flood event larger than the IDF and would require disposal in nearby landfills. New materials would be required to repair and/or construct damaged infrastructure. Project implementation minimizes flooding potential and subsequent potentially substantial future energy and materials consumption.

7.3 Significant Unavoidable Impacts

Section 5 provides a detailed analysis of the potential environmental impacts that would result from implementation of the proposed Project as well as proposed mitigation measures. Significant impacts that cannot be feasibly mitigated to a less-than-significant level would remain as potentially significant and unavoidable adverse impacts and are listed below.

7.3.1 Proposed Project

7.3.1.1 *Noise*

- > Impact NOISE-1: Project construction would expose persons to, or generate, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- > Impact NOISE-3: Project construction would cause substantial temporary or periodic increases in ambient noise levels in the Project vicinity above levels existing without the Project.

7.3.1.2 *Recreation*

- > Impact REC-1: Project construction would alter recreational access for boating.
- > Impact REC-2: Project construction could reduce the quality of recreational experiences.

7.3.2 Alternative 2 – Labyrinth Alternative

Based on the impact analyses conducted, Alternative 2 would result in similar impacts as the Proposed Project, and the same significant and unavoidable adverse impacts would occur.

7.3.3 No Project Alternative

7.3.3.1 *Geology and Soils*

- > The Alternative would expose people and/or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, ground-shaking, liquefaction, and landslides.

7.3.3.2 *Hydrology and Water Quality*

- > The Alternative would substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in flooding on- or off-site.
- > The Alternative would create or contribute runoff water, which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.
- > The Alternative would expose people or structures to a significant risk of flooding because of dam or levee failure.

8 LIST OF PREPARERS

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8.2 Consultant Team

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Final Environmental Impact Report
Santa Felicia Dam Safety
Improvement Project

APPENDIX

A

SUMMARY OF AIR QUALITY
EMISSIONS DATA

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

**Santa Felicia Dam Outlet Works Alt 1
Ventura County, Summer**

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	36.59	1000sqft	0.84	36,590.40	0
Other Asphalt Surfaces	0.70	Acre	0.70	30,492.00	0
Other Non-Asphalt Surfaces	2.83	Acre	2.83	123,274.80	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

Project Characteristics - !

Land Use - Acreage based on Constructability Analysis figures.

Construction Phase - Schedule based on Constructability Analysis, Table 3-1.

Off-road Equipment - Concrete Pump Truck, Water Truck, and Flatbed= Off-highway Truck.

Trips and VMT - Trip counts based on info in the Constructability Analysis report. It is assumed that workers and vendors will be coming from the cities of Castaic and Santa Clarita, approximately 20 miles to the east.

Grading -

Area Coating -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	18295	87120
tblAreaCoating	Area_Nonresidential_Interior	54886	261360
tblAreaCoating	Area_Parking	9226	1045
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblLandUse	BuildingSpaceSquareFeet	36,590.00	36,590.40
tblLandUse	LandUseSquareFeet	36,590.00	36,590.40
tblOffRoadEquipment	HorsePower	124.00	46.00
tblOffRoadEquipment	LoadFactor	0.44	0.45
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	13.00
tblTripsAndVMT	VendorTripNumber	0.00	11.00
tblTripsAndVMT	VendorTripNumber	0.00	17.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	0.00	40.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	31.00	24.00
tblTripsAndVMT	VendorTripNumber	31.00	18.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
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tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripNumber	18.00	20.00
tblTripsAndVMT	WorkerTripNumber	13.00	20.00
tblTripsAndVMT	WorkerTripNumber	18.00	24.00

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

tblTripsAndVMT	WorkerTripNumber	25.00	24.00
tblTripsAndVMT	WorkerTripNumber	25.00	24.00
tblTripsAndVMT	WorkerTripNumber	23.00	24.00
tblTripsAndVMT	WorkerTripNumber	15.00	20.00
tblTripsAndVMT	WorkerTripNumber	8.00	12.00
tblTripsAndVMT	WorkerTripNumber	80.00	24.00
tblTripsAndVMT	WorkerTripNumber	80.00	24.00
tblTripsAndVMT	WorkerTripNumber	3.00	8.00

2.0 Emissions Summary

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	8.8222	89.1645	67.6457	0.1606							0.0000	15,896.4044	15,896.4044	3.2571	0.0000	15,977.8313
2020	7.9237	77.7821	59.4771	0.1654							0.0000	16,277.2886	16,277.2886	3.6716	0.0000	16,369.0785
2021	6.9152	64.6957	53.7941	0.1556							0.0000	15,289.4271	15,289.4271	3.4642	0.0000	15,376.0312
Maximum	8.8222	89.1645	67.6457	0.1654							0.0000	16,277.2886	16,277.2886	3.6716	0.0000	16,369.0785

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	8.8222	89.1645	67.6457	0.1606							0.0000	15,896.4044	15,896.4044	3.2571	0.0000	15,977.8313
2020	7.9237	77.7821	59.4771	0.1654							0.0000	16,277.2886	16,277.2886	3.6716	0.0000	16,369.0785
2021	6.9152	64.6957	53.7941	0.1556							0.0000	15,289.4271	15,289.4271	3.4642	0.0000	15,376.0312
Maximum	8.8222	89.1645	67.6457	0.1654							0.0000	16,277.2886	16,277.2886	3.6716	0.0000	16,369.0785

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.9475	4.0000e-005	4.1100e-003	0.0000								8.7800e-003	8.7800e-003	2.0000e-005		9.3600e-003
Energy	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866
Mobile	0.4488	1.8590	6.3619	0.0230								2,323.4690	2,323.4690	0.0897		2,325.7107
Total	2.4190	2.0652	6.5391	0.0242								2,570.7947	2,570.7947	0.0944	4.5300e-003	2,574.5066

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.9475	4.0000e-005	4.1100e-003	0.0000								8.7800e-003	8.7800e-003	2.0000e-005		9.3600e-003
Energy	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866
Mobile	0.4488	1.8590	6.3619	0.0230								2,323.4690	2,323.4690	0.0897		2,325.7107
Total	2.4190	2.0652	6.5391	0.0242								2,570.7947	2,570.7947	0.0944	4.5300e-003	2,574.5066

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation - Mobilization	Site Preparation	8/1/2019	8/31/2019	5	22	
2	Grading - Access Roads and Pad	Grading	9/1/2019	2/29/2020	5	130	
3	Trenchin - Intake Facility Excavation	Trenching	11/1/2019	12/31/2019	5	43	
4	Trenching - Tunnel Excavation	Trenching	11/1/2019	4/30/2020	5	130	
5	Trenching - Tunnel Pipe Install	Trenching	5/1/2020	8/31/2020	5	87	
6	Trenching - Downstream Facility Excavation	Trenching	8/1/2020	8/31/2020	5	21	
7	Building Construction - Inclined Intake Facility Components	Building Construction	9/1/2020	3/31/2021	5	152	
8	Building Construction - Downstream Facility Components	Building Construction	9/1/2020	4/30/2021	5	174	
9	Demolition - Remove Intake Facility Cofferdam	Demolition	12/1/2020	12/31/2020	5	23	
10	Demolition - Abandon Existing Outlet Works	Demolition	5/1/2021	6/30/2021	5	43	
11	Site Preparation - Demobilization	Site Preparation	7/1/2021	7/30/2021	5	22	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 3.53

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation - Mobilization	Air Compressors	0	6.00	78	0.48
Site Preparation - Mobilization	Excavators	1	4.00	158	0.38
Site Preparation - Mobilization	Generator Sets	1	4.00	84	0.74
Site Preparation - Mobilization	Graders	1	4.00	187	0.41
Site Preparation - Mobilization	Off-Highway Trucks	2	8.00	402	0.38
Site Preparation - Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation - Mobilization	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Site Preparation - Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading - Access Roads and Pad	Cranes	0	7.00	231	0.29
Grading - Access Roads and Pad	Dumpers/Tenders	1	8.00	16	0.38
Grading - Access Roads and Pad	Excavators	1	4.00	158	0.38
Grading - Access Roads and Pad	Forklifts	0	8.00	89	0.20
Grading - Access Roads and Pad	Generator Sets	1	8.00	84	0.74
Grading - Access Roads and Pad	Graders	1	8.00	187	0.41
Grading - Access Roads and Pad	Off-Highway Tractors	2	4.00	46	0.45
Grading - Access Roads and Pad	Off-Highway Trucks	1	8.00	402	0.38
Grading - Access Roads and Pad	Rubber Tired Dozers	0	8.00	247	0.40
Grading - Access Roads and Pad	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Trenchin - Intake Facility Excavation	Aerial Lifts	1	8.00	63	0.31
Trenchin - Intake Facility Excavation	Concrete/Industrial Saws	0	8.00	81	0.73
Trenchin - Intake Facility Excavation	Cranes	1	4.00	231	0.29
Trenchin - Intake Facility Excavation	Dumpers/Tenders	2	8.00	16	0.38
Trenchin - Intake Facility Excavation	Excavators	1	8.00	158	0.38
Trenchin - Intake Facility Excavation	Generator Sets	2	8.00	84	0.74
Trenchin - Intake Facility Excavation	Off-Highway Trucks	1	8.00	402	0.38

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

Trenchin - Intake Facility Excavation	Rubber Tired Dozers	0	8.00	247	0.40
Trenchin - Intake Facility Excavation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching - Tunnel Excavation	Aerial Lifts	1	4.00	63	0.31
Trenching - Tunnel Excavation	Bore/Drill Rigs	1	8.00	221	0.50
Trenching - Tunnel Excavation	Crawler Tractors	1	8.00	212	0.43
Trenching - Tunnel Excavation	Crushing/Proc. Equipment	1	8.00	85	0.78
Trenching - Tunnel Excavation	Dumpers/Tenders	1	8.00	16	0.38
Trenching - Tunnel Excavation	Excavators	1	8.00	158	0.38
Trenching - Tunnel Excavation	Generator Sets	1	8.00	84	0.74
Trenching - Tunnel Excavation	Graders	0	8.00	187	0.41
Trenching - Tunnel Excavation	Rubber Tired Dozers	0	8.00	247	0.40
Trenching - Tunnel Excavation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching - Tunnel Pipe Install	Cement and Mortar Mixers	0	6.00	9	0.56
Trenching - Tunnel Pipe Install	Crawler Tractors	1	4.00	212	0.43
Trenching - Tunnel Pipe Install	Generator Sets	1	8.00	84	0.74
Trenching - Tunnel Pipe Install	Off-Highway Trucks	1	6.00	402	0.38
Trenching - Tunnel Pipe Install	Pavers	0	8.00	130	0.42
Trenching - Tunnel Pipe Install	Paving Equipment	0	6.00	132	0.36
Trenching - Tunnel Pipe Install	Rollers	0	6.00	80	0.38
Trenching - Tunnel Pipe Install	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Trenching - Tunnel Pipe Install	Welders	2	8.00	46	0.45
Trenching - Downstream Facility Excavation	Dumpers/Tenders	1	8.00	16	0.38
Trenching - Downstream Facility Excavation	Excavators	1	8.00	158	0.38
Trenching - Downstream Facility Excavation	Off-Highway Trucks	1	8.00	402	0.38
Trenching - Downstream Facility Excavation	Rubber Tired Dozers	0	8.00	247	0.40
Trenching - Downstream Facility Excavation	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

Building Construction - Inclined Intake Facility Components	Aerial Lifts	1	4.00	63	0.31
Building Construction - Inclined Intake Facility Components	Air Compressors	1	8.00	78	0.48
Building Construction - Inclined Intake Facility Components	Cranes	1	4.00	231	0.29
Building Construction - Inclined Intake Facility Components	Forklifts	0	8.00	89	0.20
Building Construction - Inclined Intake Facility Components	Generator Sets	1	8.00	84	0.74
Building Construction - Inclined Intake Facility Components	Off-Highway Tractors	1	8.00	124	0.44
Building Construction - Inclined Intake Facility Components	Off-Highway Trucks	3	8.00	402	0.38
Building Construction - Inclined Intake Facility Components	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Building Construction - Inclined Intake Facility Components	Welders	0	8.00	46	0.45
Building Construction - Downstream Facility Components	Air Compressors	1	8.00	78	0.48
Building Construction - Downstream Facility Components	Cranes	0	7.00	231	0.29
Building Construction - Downstream Facility Components	Cranes	1	4.00	231	0.29
Building Construction - Downstream Facility Components	Forklifts	0	8.00	89	0.20
Building Construction - Downstream Facility Components	Generator Sets	1	8.00	84	0.74
Building Construction - Downstream Facility Components	Off-Highway Tractors	1	8.00	124	0.44
Building Construction - Downstream Facility Components	Off-Highway Trucks	1	4.00	402	0.38
Building Construction - Downstream Facility Components	Off-Highway Trucks	2	8.00	402	0.38
Building Construction - Downstream Facility Components	Pavers	1	8.00	130	0.42
Building Construction - Downstream Facility Components	Rollers	1	8.00	80	0.38
Building Construction - Downstream Facility Components	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction - Downstream Facility Components	Welders	1	4.00	46	0.45
Demolition - Remove Intake Facility Cofferdam	Concrete/Industrial Saws	0	8.00	81	0.73

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

Demolition - Remove Intake Facility Cofferdam	Excavators	1	8.00	158	0.38
Demolition - Remove Intake Facility Cofferdam	Rubber Tired Dozers	0	8.00	247	0.40
Demolition - Abandon Existing Outlet Works	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition - Abandon Existing Outlet Works	Dumpers/Tenders	1	8.00	16	0.38
Demolition - Abandon Existing Outlet Works	Excavators	0	8.00	158	0.38
Demolition - Abandon Existing Outlet Works	Off-Highway Trucks	1	4.00	402	0.38
Demolition - Abandon Existing Outlet Works	Off-Highway Trucks	2	8.00	402	0.38
Demolition - Abandon Existing Outlet Works	Rubber Tired Dozers	0	8.00	247	0.40
Demolition - Abandon Existing Outlet Works	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation - Demobilization	Dumpers/Tenders	1	8.00	16	0.38
Site Preparation - Demobilization	Excavators	1	8.00	158	0.38
Site Preparation - Demobilization	Off-Highway Trucks	2	8.00	402	0.38
Site Preparation - Demobilization	Pavers	1	8.00	130	0.42
Site Preparation - Demobilization	Rollers	1	8.00	80	0.38
Site Preparation - Demobilization	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation - Demobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation - Mobilization	7	20.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading - Access Roads and Pad	10	24.00	11.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenchin - Intake Facility Excavation	10	24.00	17.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Tunnel Excavation	9	24.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Tunnel Pipe Install	6	20.00	40.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Downstream Facility Excavation	3	12.00	2.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction - Inclined Intake Facility	9	24.00	24.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction - Downstream Facility Construction	11	24.00	18.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demolition - Remove Intake Facility Cofferdam	1	8.00	5.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demolition - Abandon Existing Outlet Works	5	20.00	20.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation - Demobilization	7	24.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.2 Site Preparation - Mobilization - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.3647	24.4049	15.8598	0.0403								3,972.6695	3,972.6695	1.1781		4,002.1216
Total	2.3647	24.4049	15.8598	0.0403								3,972.6695	3,972.6695	1.1781		4,002.1216

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0745	1.9471	0.5070	5.6100e-003								601.8207	601.8207	0.0389		602.7918
Worker	0.1245	0.0851	1.0425	3.0100e-003								299.6187	299.6187	8.3400e-003		299.8272
Total	0.1989	2.0322	1.5495	8.6200e-003								901.4394	901.4394	0.0472		902.6190

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.2 Site Preparation - Mobilization - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.3647	24.4049	15.8598	0.0403							0.0000	3,972.6695	3,972.6695	1.1781		4,002.1216
Total	2.3647	24.4049	15.8598	0.0403							0.0000	3,972.6695	3,972.6695	1.1781		4,002.1216

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0745	1.9471	0.5070	5.6100e-003								601.8207	601.8207	0.0389		602.7918
Worker	0.1245	0.0851	1.0425	3.0100e-003								299.6187	299.6187	8.3400e-003		299.8272
Total	0.1989	2.0322	1.5495	8.6200e-003								901.4394	901.4394	0.0472		902.6190

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.3 Grading - Access Roads and Pad - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.5430	26.3656	18.3484	0.0391								3,827.5219	3,827.5219	1.0406		3,853.5368
Total	2.5430	26.3656	18.3484	0.0391								3,827.5219	3,827.5219	1.0406		3,853.5368

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0910	2.3798	0.6197	6.8600e-003								735.5586	735.5586	0.0475		736.7455
Worker	0.1494	0.1021	1.2510	3.6100e-003								359.5425	359.5425	0.0100		359.7927
Total	0.2404	2.4819	1.8706	0.0105								1,095.1011	1,095.1011	0.0575		1,096.5382

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.3 Grading - Access Roads and Pad - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.5430	26.3656	18.3484	0.0391							0.0000	3,827.5219	3,827.5219	1.0406		3,853.5368
Total	2.5430	26.3656	18.3484	0.0391							0.0000	3,827.5219	3,827.5219	1.0406		3,853.5368

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0910	2.3798	0.6197	6.8600e-003								735.5586	735.5586	0.0475		736.7455
Worker	0.1494	0.1021	1.2510	3.6100e-003								359.5425	359.5425	0.0100		359.7927
Total	0.2404	2.4819	1.8706	0.0105								1,095.1011	1,095.1011	0.0575		1,096.5382

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.3 Grading - Access Roads and Pad - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.3625	24.1136	18.0539	0.0391								3,757.6803	3,757.6803	1.0357		3,783.5733
Total	2.3625	24.1136	18.0539	0.0391								3,757.6803	3,757.6803	1.0357		3,783.5733

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0732	2.0650	0.5502	6.8000e-003								730.5089	730.5089	0.0455		731.6454
Worker	0.1390	0.0913	1.1413	3.4900e-003								348.1739	348.1739	8.9400e-003		348.3974
Total	0.2121	2.1563	1.6915	0.0103								1,078.6828	1,078.6828	0.0544		1,080.0429

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.3 Grading - Access Roads and Pad - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.3625	24.1136	18.0539	0.0391							0.0000	3,757.6803	3,757.6803	1.0357		3,783.5733
Total	2.3625	24.1136	18.0539	0.0391							0.0000	3,757.6803	3,757.6803	1.0357		3,783.5733

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0732	2.0650	0.5502	6.8000e-003								730.5089	730.5089	0.0455		731.6454
Worker	0.1390	0.0913	1.1413	3.4900e-003								348.1739	348.1739	8.9400e-003		348.3974
Total	0.2121	2.1563	1.6915	0.0103								1,078.6828	1,078.6828	0.0544		1,080.0429

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.4 Trenchin - Intake Facility Excavation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.7641	26.7173	22.0525	0.0438								4,253.7295	4,253.7295	1.0051		4,278.8557
Total	2.7641	26.7173	22.0525	0.0438								4,253.7295	4,253.7295	1.0051		4,278.8557

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1407	3.6779	0.9577	0.0106								1,136.7724	1,136.7724	0.0734		1,138.6067
Worker	0.1494	0.1021	1.2510	3.6100e-003								359.5425	359.5425	0.0100		359.7927
Total	0.2900	3.7800	2.2087	0.0142								1,496.3148	1,496.3148	0.0834		1,498.3994

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.4 Trenchin - Intake Facility Excavation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.7641	26.7173	22.0525	0.0438							0.0000	4,253.7295	4,253.7295	1.0051		4,278.8557
Total	2.7641	26.7173	22.0525	0.0438							0.0000	4,253.7295	4,253.7295	1.0051		4,278.8557

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1407	3.6779	0.9577	0.0106								1,136.7724	1,136.7724	0.0734		1,138.6067
Worker	0.1494	0.1021	1.2510	3.6100e-003								359.5425	359.5425	0.0100		359.7927
Total	0.2900	3.7800	2.2087	0.0142								1,496.3148	1,496.3148	0.0834		1,498.3994

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.5 Trenching - Tunnel Excavation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.7609	27.7704	21.4076	0.0438								4,262.3740	4,262.3740	1.0217		4,287.9169
Total	2.7609	27.7704	21.4076	0.0438								4,262.3740	4,262.3740	1.0217		4,287.9169

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0745	1.9471	0.5070	5.6100e-003								601.8207	601.8207	0.0389		602.7918
Worker	0.1494	0.1021	1.2510	3.6100e-003								359.5425	359.5425	0.0100		359.7927
Total	0.2238	2.0492	1.7580	9.2200e-003								961.3631	961.3631	0.0489		962.5844

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.5 Trenching - Tunnel Excavation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.7609	27.7704	21.4076	0.0438							0.0000	4,262.3740	4,262.3740	1.0217		4,287.9169
Total	2.7609	27.7704	21.4076	0.0438							0.0000	4,262.3740	4,262.3740	1.0217		4,287.9169

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0745	1.9471	0.5070	5.6100e-003								601.8207	601.8207	0.0389		602.7918
Worker	0.1494	0.1021	1.2510	3.6100e-003								359.5425	359.5425	0.0100		359.7927
Total	0.2238	2.0492	1.7580	9.2200e-003								961.3631	961.3631	0.0489		962.5844

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.5 Trenching - Tunnel Excavation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5658	25.6574	21.2637	0.0438								4,201.6657	4,201.6657	1.0135		4,227.0033
Total	2.5658	25.6574	21.2637	0.0438								4,201.6657	4,201.6657	1.0135		4,227.0033

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0599	1.6896	0.4502	5.5700e-003								597.6891	597.6891	0.0372		598.6190
Worker	0.1390	0.0913	1.1413	3.4900e-003								348.1739	348.1739	8.9400e-003		348.3974
Total	0.1988	1.7808	1.5915	9.0600e-003								945.8630	945.8630	0.0461		947.0164

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.5 Trenching - Tunnel Excavation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5658	25.6574	21.2637	0.0438							0.0000	4,201.6657	4,201.6657	1.0135		4,227.0033
Total	2.5658	25.6574	21.2637	0.0438							0.0000	4,201.6657	4,201.6657	1.0135		4,227.0033

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0599	1.6896	0.4502	5.5700e-003								597.6891	597.6891	0.0372		598.6190
Worker	0.1390	0.0913	1.1413	3.4900e-003								348.1739	348.1739	8.9400e-003		348.3974
Total	0.1988	1.7808	1.5915	9.0600e-003								945.8630	945.8630	0.0461		947.0164

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.6 Trenching - Tunnel Pipe Install - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9747	16.1397	12.4870	0.0271								2,527.5350	2,527.5350	0.5782		2,541.9891
Total	1.9747	16.1397	12.4870	0.0271								2,527.5350	2,527.5350	0.5782		2,541.9891

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2661	7.5092	2.0008	0.0247								2,656.3961	2,656.3961	0.1653		2,660.5289
Worker	0.1158	0.0760	0.9511	2.9100e-003								290.1449	290.1449	7.4500e-003		290.3312
Total	0.3819	7.5852	2.9519	0.0277								2,946.5410	2,946.5410	0.1728		2,950.8601

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.6 Trenching - Tunnel Pipe Install - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9747	16.1397	12.4870	0.0271							0.0000	2,527.5350	2,527.5350	0.5782		2,541.9891
Total	1.9747	16.1397	12.4870	0.0271							0.0000	2,527.5350	2,527.5350	0.5782		2,541.9891

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2661	7.5092	2.0008	0.0247								2,656.3961	2,656.3961	0.1653		2,660.5289
Worker	0.1158	0.0760	0.9511	2.9100e-003								290.1449	290.1449	7.4500e-003		290.3312
Total	0.3819	7.5852	2.9519	0.0277								2,946.5410	2,946.5410	0.1728		2,950.8601

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.7 Trenching - Downstream Facility Excavation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9816	9.2003	7.3287	0.0191								1,839.6807	1,839.6807	0.5818		1,854.2263
Total	0.9816	9.2003	7.3287	0.0191								1,839.6807	1,839.6807	0.5818		1,854.2263

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0133	0.3755	0.1000	1.2400e-003								132.8198	132.8198	8.2700e-003		133.0264
Worker	0.0695	0.0456	0.5707	1.7500e-003								174.0870	174.0870	4.4700e-003		174.1987
Total	0.0828	0.4211	0.6707	2.9900e-003								306.9068	306.9068	0.0127		307.2252

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.7 Trenching - Downstream Facility Excavation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9816	9.2003	7.3287	0.0191							0.0000	1,839.6807	1,839.6807	0.5818		1,854.2263
Total	0.9816	9.2003	7.3287	0.0191							0.0000	1,839.6807	1,839.6807	0.5818		1,854.2263

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0133	0.3755	0.1000	1.2400e-003								132.8198	132.8198	8.2700e-003		133.0264
Worker	0.0695	0.0456	0.5707	1.7500e-003								174.0870	174.0870	4.4700e-003		174.1987
Total	0.0828	0.4211	0.6707	2.9900e-003								306.9068	306.9068	0.0127		307.2252

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.8 Building Construction - Inclined Intake Facility Components - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3233	31.5434	23.4162	0.0601								5,800.3291	5,800.3291	1.6172		5,840.7594
Total	3.3233	31.5434	23.4162	0.0601								5,800.3291	5,800.3291	1.6172		5,840.7594

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1596	4.5055	1.2005	0.0148								1,593.8377	1,593.8377	0.0992		1,596.3173
Worker	0.1390	0.0913	1.1413	3.4900e-003								348.1739	348.1739	8.9400e-003		348.3974
Total	0.2986	4.5968	2.3418	0.0183								1,942.0116	1,942.0116	0.1081		1,944.7148

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.8 Building Construction - Inclined Intake Facility Components - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3233	31.5434	23.4162	0.0601							0.0000	5,800.3291	5,800.3291	1.6172		5,840.7594
Total	3.3233	31.5434	23.4162	0.0601							0.0000	5,800.3291	5,800.3291	1.6172		5,840.7594

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1596	4.5055	1.2005	0.0148								1,593.8377	1,593.8377	0.0992		1,596.3173
Worker	0.1390	0.0913	1.1413	3.4900e-003								348.1739	348.1739	8.9400e-003		348.3974
Total	0.2986	4.5968	2.3418	0.0183								1,942.0116	1,942.0116	0.1081		1,944.7148

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.8 Building Construction - Inclined Intake Facility Components - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.0348	27.2242	22.6878	0.0601								5,800.0789	5,800.0789	1.6105		5,840.3424
Total	3.0348	27.2242	22.6878	0.0601								5,800.0789	5,800.0789	1.6105		5,840.3424

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1289	3.8817	1.0744	0.0147								1,583.4611	1,583.4611	0.0962		1,585.8652
Worker	0.1305	0.0823	1.0564	3.3900e-003								337.7226	337.7226	8.1600e-003		337.9267
Total	0.2595	3.9641	2.1308	0.0181								1,921.1837	1,921.1837	0.1043		1,923.7919

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.8 Building Construction - Inclined Intake Facility Components - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.0348	27.2242	22.6878	0.0601							0.0000	5,800.0789	5,800.0789	1.6105		5,840.3423
Total	3.0348	27.2242	22.6878	0.0601							0.0000	5,800.0789	5,800.0789	1.6105		5,840.3423

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1289	3.8817	1.0744	0.0147								1,583.4611	1,583.4611	0.0962		1,585.8652
Worker	0.1305	0.0823	1.0564	3.3900e-003								337.7226	337.7226	8.1600e-003		337.9267
Total	0.2595	3.9641	2.1308	0.0181								1,921.1837	1,921.1837	0.1043		1,923.7919

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.9 Building Construction - Downstream Facility Components - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7186	34.7898	27.7791	0.0629								6,043.1699	6,043.1699	1.6775		6,085.1082
Total	3.7186	34.7898	27.7791	0.0629								6,043.1699	6,043.1699	1.6775		6,085.1082

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1197	3.3791	0.9003	0.0111								1,195.3783	1,195.3783	0.0744		1,197.2380
Worker	0.1390	0.0913	1.1413	3.4900e-003								348.1739	348.1739	8.9400e-003		348.3974
Total	0.2587	3.4704	2.0417	0.0146								1,543.5521	1,543.5521	0.0833		1,545.6354

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.9 Building Construction - Downstream Facility Components - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7186	34.7898	27.7791	0.0629							0.0000	6,043.1699	6,043.1699	1.6775		6,085.1082
Total	3.7186	34.7898	27.7791	0.0629							0.0000	6,043.1699	6,043.1699	1.6775		6,085.1082

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1197	3.3791	0.9003	0.0111								1,195.3783	1,195.3783	0.0744		1,197.2380
Worker	0.1390	0.0913	1.1413	3.4900e-003								348.1739	348.1739	8.9400e-003		348.3974
Total	0.2587	3.4704	2.0417	0.0146								1,543.5521	1,543.5521	0.0833		1,545.6354

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.9 Building Construction - Downstream Facility Components - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3938	30.5139	27.1134	0.0629								6,042.8461	6,042.8461	1.6690		6,084.5714
Total	3.3938	30.5139	27.1134	0.0629								6,042.8461	6,042.8461	1.6690		6,084.5714

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0967	2.9113	0.8058	0.0111								1,187.5958	1,187.5958	0.0721		1,189.3989
Worker	0.1305	0.0823	1.0564	3.3900e-003								337.7226	337.7226	8.1600e-003		337.9267
Total	0.2272	2.9936	1.8622	0.0144								1,525.3184	1,525.3184	0.0803		1,527.3256

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.9 Building Construction - Downstream Facility Components - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3938	30.5139	27.1134	0.0629							0.0000	6,042.8461	6,042.8461	1.6690		6,084.5714
Total	3.3938	30.5139	27.1134	0.0629							0.0000	6,042.8461	6,042.8461	1.6690		6,084.5714

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0967	2.9113	0.8058	0.0111								1,187.5958	1,187.5958	0.0721		1,189.3989
Worker	0.1305	0.0823	1.0564	3.3900e-003								337.7226	337.7226	8.1600e-003		337.9267
Total	0.2272	2.9936	1.8622	0.0144								1,525.3184	1,525.3184	0.0803		1,527.3256

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.10 Demolition - Remove Intake Facility Cofferdam - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2450	2.4126	3.2678	5.1700e-003								500.1184	500.1184	0.1618		504.1621
Total	0.2450	2.4126	3.2678	5.1700e-003								500.1184	500.1184	0.1618		504.1621

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0333	0.9387	0.2501	3.0900e-003								332.0495	332.0495	0.0207		332.5661
Worker	0.0463	0.0304	0.3804	1.1600e-003								116.0580	116.0580	2.9800e-003		116.1325
Total	0.0796	0.9691	0.6305	4.2500e-003								448.1075	448.1075	0.0236		448.6986

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.10 Demolition - Remove Intake Facility Cofferdam - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2450	2.4126	3.2678	5.1700e-003							0.0000	500.1184	500.1184	0.1618		504.1621
Total	0.2450	2.4126	3.2678	5.1700e-003							0.0000	500.1184	500.1184	0.1618		504.1621

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0333	0.9387	0.2501	3.0900e-003								332.0495	332.0495	0.0207		332.5661
Worker	0.0463	0.0304	0.3804	1.1600e-003								116.0580	116.0580	2.9800e-003		116.1325
Total	0.0796	0.9691	0.6305	4.2500e-003								448.1075	448.1075	0.0236		448.6986

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.11 Demolition - Abandon Existing Outlet Works - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7755	15.5189	11.5219	0.0369								3,558.1479	3,558.1479	1.1376		3,586.5881
Total	1.7755	15.5189	11.5219	0.0369								3,558.1479	3,558.1479	1.1376		3,586.5881

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1074	3.2348	0.8953	0.0123								1,319.5509	1,319.5509	0.0801		1,321.5543
Worker	0.1088	0.0686	0.8804	2.8200e-003								281.4355	281.4355	6.8000e-003		281.6056
Total	0.2162	3.3034	1.7757	0.0151								1,600.9864	1,600.9864	0.0869		1,603.1599

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.11 Demolition - Abandon Existing Outlet Works - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7755	15.5189	11.5219	0.0369							0.0000	3,558.1479	3,558.1479	1.1376		3,586.5881
Total	1.7755	15.5189	11.5219	0.0369							0.0000	3,558.1479	3,558.1479	1.1376		3,586.5881

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1074	3.2348	0.8953	0.0123								1,319.5509	1,319.5509	0.0801		1,321.5543
Worker	0.1088	0.0686	0.8804	2.8200e-003								281.4355	281.4355	6.8000e-003		281.6056
Total	0.2162	3.3034	1.7757	0.0151								1,600.9864	1,600.9864	0.0869		1,603.1599

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.12 Site Preparation - Demobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.1375	19.5599	17.7768	0.0428								4,128.2281	4,128.2281	1.3220		4,161.2777
Total	2.1375	19.5599	17.7768	0.0428								4,128.2281	4,128.2281	1.3220		4,161.2777

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0698	2.1026	0.5820	7.9800e-003								857.7081	857.7081	0.0521		859.0103
Worker	0.1305	0.0823	1.0564	3.3900e-003								337.7226	337.7226	8.1600e-003		337.9267
Total	0.2004	2.1849	1.6384	0.0114								1,195.4307	1,195.4307	0.0603		1,196.9370

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

3.12 Site Preparation - Demobilization - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.1375	19.5599	17.7768	0.0428							0.0000	4,128.2281	4,128.2281	1.3220		4,161.2777
Total	2.1375	19.5599	17.7768	0.0428							0.0000	4,128.2281	4,128.2281	1.3220		4,161.2777

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0698	2.1026	0.5820	7.9800e-003								857.7081	857.7081	0.0521		859.0103
Worker	0.1305	0.0823	1.0564	3.3900e-003								337.7226	337.7226	8.1600e-003		337.9267
Total	0.2004	2.1849	1.6384	0.0114								1,195.4307	1,195.4307	0.0603		1,196.9370

4.0 Operational Detail - Mobile

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.4488	1.8590	6.3619	0.0230								2,323.4690	2,323.4690	0.0897		2,325.7107
Unmitigated	0.4488	1.8590	6.3619	0.0230								2,323.4690	2,323.4690	0.0897		2,325.7107

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
General Light Industry	255.03	48.30	24.88	744,182	744,182
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	255.03	48.30	24.88	744,182	744,182

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Other Asphalt Surfaces	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Other Non-Asphalt Surfaces	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866
NaturalGas Unmitigated	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	2102.19	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	2.10219	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866

6.0 Area Detail

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.9475	4.0000e-005	4.1100e-003	0.0000								8.7800e-003	8.7800e-003	2.0000e-005		9.3600e-003
Unmitigated	1.9475	4.0000e-005	4.1100e-003	0.0000								8.7800e-003	8.7800e-003	2.0000e-005		9.3600e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.1096												0.0000			0.0000
Consumer Products	0.8375												0.0000			0.0000
Landscaping	3.8000e-004	4.0000e-005	4.1100e-003	0.0000								8.7800e-003	8.7800e-003	2.0000e-005		9.3600e-003
Total	1.9475	4.0000e-005	4.1100e-003	0.0000								8.7800e-003	8.7800e-003	2.0000e-005		9.3600e-003

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.1096												0.0000			0.0000
Consumer Products	0.8375												0.0000			0.0000
Landscaping	3.8000e-004	4.0000e-005	4.1100e-003	0.0000								8.7800e-003	8.7800e-003	2.0000e-005		9.3600e-003
Total	1.9475	4.0000e-005	4.1100e-003	0.0000								8.7800e-003	8.7800e-003	2.0000e-005		9.3600e-003

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

Fire Pumps and Emergency Generators

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Summer

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

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

User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

Santa Felicia Dam Outlet Works Alt 1
Ventura County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	36.59	1000sqft	0.84	36,590.40	0
Other Asphalt Surfaces	0.70	Acre	0.70	30,492.00	0
Other Non-Asphalt Surfaces	2.83	Acre	2.83	123,274.80	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

Project Characteristics - !

Land Use - Acreage based on Constructability Analysis figures.

Construction Phase - Schedule based on Constructability Analysis, Table 3-1.

Off-road Equipment - Concrete Pump Truck, Water Truck, and Flatbed= Off-highway Truck.

Trips and VMT - Trip counts based on info in the Constructability Analysis report. It is assumed that workers and vendors will be coming from the cities of Castaic and Santa Clarita, approximately 20 miles to the east.

Grading -

Area Coating -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	18295	87120
tblAreaCoating	Area_Nonresidential_Interior	54886	261360
tblAreaCoating	Area_Parking	9226	1045
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblLandUse	BuildingSpaceSquareFeet	36,590.00	36,590.40
tblLandUse	LandUseSquareFeet	36,590.00	36,590.40
tblOffRoadEquipment	HorsePower	124.00	46.00
tblOffRoadEquipment	LoadFactor	0.44	0.45
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	13.00
tblTripsAndVMT	VendorTripNumber	0.00	11.00
tblTripsAndVMT	VendorTripNumber	0.00	17.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	0.00	40.00
tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	VendorTripNumber	31.00	24.00
tblTripsAndVMT	VendorTripNumber	31.00	18.00
tblTripsAndVMT	VendorTripNumber	0.00	5.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
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tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripNumber	18.00	20.00
tblTripsAndVMT	WorkerTripNumber	13.00	20.00
tblTripsAndVMT	WorkerTripNumber	18.00	24.00

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

tblTripsAndVMT	WorkerTripNumber	25.00	24.00
tblTripsAndVMT	WorkerTripNumber	25.00	24.00
tblTripsAndVMT	WorkerTripNumber	23.00	24.00
tblTripsAndVMT	WorkerTripNumber	15.00	20.00
tblTripsAndVMT	WorkerTripNumber	8.00	12.00
tblTripsAndVMT	WorkerTripNumber	80.00	24.00
tblTripsAndVMT	WorkerTripNumber	80.00	24.00
tblTripsAndVMT	WorkerTripNumber	3.00	8.00

2.0 Emissions Summary

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	8.9116	89.3727	67.5947	0.1598							0.0000	15,819.1388	15,819.1388	3.2614	0.0000	15,900.6741
2020	7.9930	77.9723	59.4893	0.1647							0.0000	16,205.7090	16,205.7090	3.6771	0.0000	16,297.6377
2021	6.9716	64.8262	53.8049	0.1549							0.0000	15,228.0036	15,228.0036	3.4689	0.0000	15,314.7253
Maximum	8.9116	89.3727	67.5947	0.1647							0.0000	16,205.7090	16,205.7090	3.6771	0.0000	16,297.6377

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	8.9116	89.3727	67.5947	0.1598							0.0000	15,819.1388	15,819.1388	3.2614	0.0000	15,900.6741
2020	7.9930	77.9723	59.4893	0.1647							0.0000	16,205.7090	16,205.7090	3.6771	0.0000	16,297.6377
2021	6.9716	64.8262	53.8049	0.1549							0.0000	15,228.0036	15,228.0036	3.4689	0.0000	15,314.7253
Maximum	8.9116	89.3727	67.5947	0.1647							0.0000	16,205.7090	16,205.7090	3.6771	0.0000	16,297.6377

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.9475	4.0000e-005	4.1100e-003	0.0000								8.7800e-003	8.7800e-003	2.0000e-005		9.3600e-003
Energy	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866
Mobile	0.4284	1.9576	6.3040	0.0220								2,227.9737	2,227.9737	0.0900		2,230.2239
Total	2.3986	2.1637	6.4813	0.0233								2,475.2994	2,475.2994	0.0948	4.5300e-003	2,479.0199

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.9475	4.0000e-005	4.1100e-003	0.0000								8.7800e-003	8.7800e-003	2.0000e-005		9.3600e-003
Energy	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866
Mobile	0.4284	1.9576	6.3040	0.0220								2,227.9737	2,227.9737	0.0900		2,230.2239
Total	2.3986	2.1637	6.4813	0.0233								2,475.2994	2,475.2994	0.0948	4.5300e-003	2,479.0199

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation - Mobilization	Site Preparation	8/1/2019	8/31/2019	5	22	
2	Grading - Access Roads and Pad	Grading	9/1/2019	2/29/2020	5	130	
3	Trenchin - Intake Facility Excavation	Trenching	11/1/2019	12/31/2019	5	43	
4	Trenching - Tunnel Excavation	Trenching	11/1/2019	4/30/2020	5	130	
5	Trenching - Tunnel Pipe Install	Trenching	5/1/2020	8/31/2020	5	87	
6	Trenching - Downstream Facility Excavation	Trenching	8/1/2020	8/31/2020	5	21	
7	Building Construction - Inclined Intake Facility Components	Building Construction	9/1/2020	3/31/2021	5	152	
8	Building Construction - Downstream Facility Components	Building Construction	9/1/2020	4/30/2021	5	174	
9	Demolition - Remove Intake Facility Cofferdam	Demolition	12/1/2020	12/31/2020	5	23	
10	Demolition - Abandon Existing Outlet Works	Demolition	5/1/2021	6/30/2021	5	43	
11	Site Preparation - Demobilization	Site Preparation	7/1/2021	7/30/2021	5	22	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 3.53

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation - Mobilization	Air Compressors	0	6.00	78	0.48
Site Preparation - Mobilization	Excavators	1	4.00	158	0.38
Site Preparation - Mobilization	Generator Sets	1	4.00	84	0.74
Site Preparation - Mobilization	Graders	1	4.00	187	0.41
Site Preparation - Mobilization	Off-Highway Trucks	2	8.00	402	0.38
Site Preparation - Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation - Mobilization	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Site Preparation - Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading - Access Roads and Pad	Cranes	0	7.00	231	0.29
Grading - Access Roads and Pad	Dumpers/Tenders	1	8.00	16	0.38
Grading - Access Roads and Pad	Excavators	1	4.00	158	0.38
Grading - Access Roads and Pad	Forklifts	0	8.00	89	0.20
Grading - Access Roads and Pad	Generator Sets	1	8.00	84	0.74
Grading - Access Roads and Pad	Graders	1	8.00	187	0.41
Grading - Access Roads and Pad	Off-Highway Tractors	2	4.00	46	0.45
Grading - Access Roads and Pad	Off-Highway Trucks	1	8.00	402	0.38
Grading - Access Roads and Pad	Rubber Tired Dozers	0	8.00	247	0.40
Grading - Access Roads and Pad	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Trenchin - Intake Facility Excavation	Aerial Lifts	1	8.00	63	0.31
Trenchin - Intake Facility Excavation	Concrete/Industrial Saws	0	8.00	81	0.73
Trenchin - Intake Facility Excavation	Cranes	1	4.00	231	0.29
Trenchin - Intake Facility Excavation	Dumpers/Tenders	2	8.00	16	0.38
Trenchin - Intake Facility Excavation	Excavators	1	8.00	158	0.38
Trenchin - Intake Facility Excavation	Generator Sets	2	8.00	84	0.74
Trenchin - Intake Facility Excavation	Off-Highway Trucks	1	8.00	402	0.38

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

Trenchin - Intake Facility Excavation	Rubber Tired Dozers	0	8.00	247	0.40
Trenchin - Intake Facility Excavation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching - Tunnel Excavation	Aerial Lifts	1	4.00	63	0.31
Trenching - Tunnel Excavation	Bore/Drill Rigs	1	8.00	221	0.50
Trenching - Tunnel Excavation	Crawler Tractors	1	8.00	212	0.43
Trenching - Tunnel Excavation	Crushing/Proc. Equipment	1	8.00	85	0.78
Trenching - Tunnel Excavation	Dumpers/Tenders	1	8.00	16	0.38
Trenching - Tunnel Excavation	Excavators	1	8.00	158	0.38
Trenching - Tunnel Excavation	Generator Sets	1	8.00	84	0.74
Trenching - Tunnel Excavation	Graders	0	8.00	187	0.41
Trenching - Tunnel Excavation	Rubber Tired Dozers	0	8.00	247	0.40
Trenching - Tunnel Excavation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching - Tunnel Pipe Install	Cement and Mortar Mixers	0	6.00	9	0.56
Trenching - Tunnel Pipe Install	Crawler Tractors	1	4.00	212	0.43
Trenching - Tunnel Pipe Install	Generator Sets	1	8.00	84	0.74
Trenching - Tunnel Pipe Install	Off-Highway Trucks	1	6.00	402	0.38
Trenching - Tunnel Pipe Install	Pavers	0	8.00	130	0.42
Trenching - Tunnel Pipe Install	Paving Equipment	0	6.00	132	0.36
Trenching - Tunnel Pipe Install	Rollers	0	6.00	80	0.38
Trenching - Tunnel Pipe Install	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Trenching - Tunnel Pipe Install	Welders	2	8.00	46	0.45
Trenching - Downstream Facility Excavation	Dumpers/Tenders	1	8.00	16	0.38
Trenching - Downstream Facility Excavation	Excavators	1	8.00	158	0.38
Trenching - Downstream Facility Excavation	Off-Highway Trucks	1	8.00	402	0.38
Trenching - Downstream Facility Excavation	Rubber Tired Dozers	0	8.00	247	0.40
Trenching - Downstream Facility Excavation	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

Building Construction - Inclined Intake Facility Components	Aerial Lifts	1	4.00	63	0.31
Building Construction - Inclined Intake Facility Components	Air Compressors	1	8.00	78	0.48
Building Construction - Inclined Intake Facility Components	Cranes	1	4.00	231	0.29
Building Construction - Inclined Intake Facility Components	Forklifts	0	8.00	89	0.20
Building Construction - Inclined Intake Facility Components	Generator Sets	1	8.00	84	0.74
Building Construction - Inclined Intake Facility Components	Off-Highway Tractors	1	8.00	124	0.44
Building Construction - Inclined Intake Facility Components	Off-Highway Trucks	3	8.00	402	0.38
Building Construction - Inclined Intake Facility Components	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Building Construction - Inclined Intake Facility Components	Welders	0	8.00	46	0.45
Building Construction - Downstream Facility Components	Air Compressors	1	8.00	78	0.48
Building Construction - Downstream Facility Components	Cranes	0	7.00	231	0.29
Building Construction - Downstream Facility Components	Cranes	1	4.00	231	0.29
Building Construction - Downstream Facility Components	Forklifts	0	8.00	89	0.20
Building Construction - Downstream Facility Components	Generator Sets	1	8.00	84	0.74
Building Construction - Downstream Facility Components	Off-Highway Tractors	1	8.00	124	0.44
Building Construction - Downstream Facility Components	Off-Highway Trucks	1	4.00	402	0.38
Building Construction - Downstream Facility Components	Off-Highway Trucks	2	8.00	402	0.38
Building Construction - Downstream Facility Components	Pavers	1	8.00	130	0.42
Building Construction - Downstream Facility Components	Rollers	1	8.00	80	0.38
Building Construction - Downstream Facility Components	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction - Downstream Facility Components	Welders	1	4.00	46	0.45
Demolition - Remove Intake Facility Cofferdam	Concrete/Industrial Saws	0	8.00	81	0.73

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

Demolition - Remove Intake Facility Cofferdam	Excavators	1	8.00	158	0.38
Demolition - Remove Intake Facility Cofferdam	Rubber Tired Dozers	0	8.00	247	0.40
Demolition - Abandon Existing Outlet Works	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition - Abandon Existing Outlet Works	Dumpers/Tenders	1	8.00	16	0.38
Demolition - Abandon Existing Outlet Works	Excavators	0	8.00	158	0.38
Demolition - Abandon Existing Outlet Works	Off-Highway Trucks	1	4.00	402	0.38
Demolition - Abandon Existing Outlet Works	Off-Highway Trucks	2	8.00	402	0.38
Demolition - Abandon Existing Outlet Works	Rubber Tired Dozers	0	8.00	247	0.40
Demolition - Abandon Existing Outlet Works	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation - Demobilization	Dumpers/Tenders	1	8.00	16	0.38
Site Preparation - Demobilization	Excavators	1	8.00	158	0.38
Site Preparation - Demobilization	Off-Highway Trucks	2	8.00	402	0.38
Site Preparation - Demobilization	Pavers	1	8.00	130	0.42
Site Preparation - Demobilization	Rollers	1	8.00	80	0.38
Site Preparation - Demobilization	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation - Demobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation - Mobilization	7	20.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading - Access Roads and Pad	10	24.00	11.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenchin - Intake Facility Excavation	10	24.00	17.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Tunnel Excavation	9	24.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Tunnel Pipe Install	6	20.00	40.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Downstream Facility Excavation	3	12.00	2.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction - Inclined Intake Facility	9	24.00	24.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction - Downstream Facility Construction	11	24.00	18.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demolition - Remove Intake Facility Cofferdam	1	8.00	5.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demolition - Abandon Existing Outlet Works	5	20.00	20.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation - Demobilization	7	24.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.2 Site Preparation - Mobilization - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.3647	24.4049	15.8598	0.0403								3,972.6695	3,972.6695	1.1781		4,002.1216
Total	2.3647	24.4049	15.8598	0.0403								3,972.6695	3,972.6695	1.1781		4,002.1216

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0769	1.9849	0.5392	5.5600e-003								595.8412	595.8412	0.0402		596.8470
Worker	0.1465	0.0998	0.9916	2.8600e-003								284.9845	284.9845	7.9600e-003		285.1835
Total	0.2234	2.0847	1.5308	8.4200e-003								880.8256	880.8256	0.0482		882.0305

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.2 Site Preparation - Mobilization - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.3647	24.4049	15.8598	0.0403							0.0000	3,972.6695	3,972.6695	1.1781		4,002.1216
Total	2.3647	24.4049	15.8598	0.0403							0.0000	3,972.6695	3,972.6695	1.1781		4,002.1216

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0769	1.9849	0.5392	5.5600e-003								595.8412	595.8412	0.0402		596.8470
Worker	0.1465	0.0998	0.9916	2.8600e-003								284.9845	284.9845	7.9600e-003		285.1835
Total	0.2234	2.0847	1.5308	8.4200e-003								880.8256	880.8256	0.0482		882.0305

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.3 Grading - Access Roads and Pad - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.5430	26.3656	18.3484	0.0391								3,827.5219	3,827.5219	1.0406		3,853.5368
Total	2.5430	26.3656	18.3484	0.0391								3,827.5219	3,827.5219	1.0406		3,853.5368

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0940	2.4260	0.6590	6.7900e-003								728.2503	728.2503	0.0492		729.4797
Worker	0.1758	0.1197	1.1899	3.4300e-003								341.9814	341.9814	9.5500e-003		342.2202
Total	0.2698	2.5457	1.8489	0.0102								1,070.2317	1,070.2317	0.0587		1,071.6998

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.3 Grading - Access Roads and Pad - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.5430	26.3656	18.3484	0.0391							0.0000	3,827.5219	3,827.5219	1.0406		3,853.5368
Total	2.5430	26.3656	18.3484	0.0391							0.0000	3,827.5219	3,827.5219	1.0406		3,853.5368

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0940	2.4260	0.6590	6.7900e-003								728.2503	728.2503	0.0492		729.4797
Worker	0.1758	0.1197	1.1899	3.4300e-003								341.9814	341.9814	9.5500e-003		342.2202
Total	0.2698	2.5457	1.8489	0.0102								1,070.2317	1,070.2317	0.0587		1,071.6998

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.3 Grading - Access Roads and Pad - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.3625	24.1136	18.0539	0.0391								3,757.6803	3,757.6803	1.0357		3,783.5733
Total	2.3625	24.1136	18.0539	0.0391								3,757.6803	3,757.6803	1.0357		3,783.5733

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0758	2.1010	0.5849	6.7400e-003								723.0466	723.0466	0.0470		724.2215
Worker	0.1638	0.1070	1.0832	3.3200e-003								331.1617	331.1617	8.5100e-003		331.3745
Total	0.2396	2.2079	1.6680	0.0101								1,054.2083	1,054.2083	0.0555		1,055.5960

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.3 Grading - Access Roads and Pad - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.3625	24.1136	18.0539	0.0391							0.0000	3,757.6803	3,757.6803	1.0357		3,783.5733
Total	2.3625	24.1136	18.0539	0.0391							0.0000	3,757.6803	3,757.6803	1.0357		3,783.5733

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0758	2.1010	0.5849	6.7400e-003								723.0466	723.0466	0.0470		724.2215
Worker	0.1638	0.1070	1.0832	3.3200e-003								331.1617	331.1617	8.5100e-003		331.3745
Total	0.2396	2.2079	1.6680	0.0101								1,054.2083	1,054.2083	0.0555		1,055.5960

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.4 Trenchin - Intake Facility Excavation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.7641	26.7173	22.0525	0.0438								4,253.7295	4,253.7295	1.0051		4,278.8557
Total	2.7641	26.7173	22.0525	0.0438								4,253.7295	4,253.7295	1.0051		4,278.8557

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1453	3.7493	1.0185	0.0105								1,125.4778	1,125.4778	0.0760		1,127.3777
Worker	0.1758	0.1197	1.1899	3.4300e-003								341.9814	341.9814	9.5500e-003		342.2202
Total	0.3211	3.8690	2.2084	0.0139								1,467.4591	1,467.4591	0.0855		1,469.5978

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.4 Trenchin - Intake Facility Excavation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.7641	26.7173	22.0525	0.0438							0.0000	4,253.7295	4,253.7295	1.0051		4,278.8557
Total	2.7641	26.7173	22.0525	0.0438							0.0000	4,253.7295	4,253.7295	1.0051		4,278.8557

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1453	3.7493	1.0185	0.0105								1,125.4778	1,125.4778	0.0760		1,127.3777
Worker	0.1758	0.1197	1.1899	3.4300e-003								341.9814	341.9814	9.5500e-003		342.2202
Total	0.3211	3.8690	2.2084	0.0139								1,467.4591	1,467.4591	0.0855		1,469.5978

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.5 Trenching - Tunnel Excavation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.7609	27.7704	21.4076	0.0438								4,262.3740	4,262.3740	1.0217		4,287.9169
Total	2.7609	27.7704	21.4076	0.0438								4,262.3740	4,262.3740	1.0217		4,287.9169

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0769	1.9849	0.5392	5.5600e-003								595.8412	595.8412	0.0402		596.8470
Worker	0.1758	0.1197	1.1899	3.4300e-003								341.9814	341.9814	9.5500e-003		342.2202
Total	0.2527	2.1046	1.7291	8.9900e-003								937.8225	937.8225	0.0498		939.0672

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.5 Trenching - Tunnel Excavation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.7609	27.7704	21.4076	0.0438							0.0000	4,262.3740	4,262.3740	1.0217		4,287.9169
Total	2.7609	27.7704	21.4076	0.0438							0.0000	4,262.3740	4,262.3740	1.0217		4,287.9169

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0769	1.9849	0.5392	5.5600e-003								595.8412	595.8412	0.0402		596.8470
Worker	0.1758	0.1197	1.1899	3.4300e-003								341.9814	341.9814	9.5500e-003		342.2202
Total	0.2527	2.1046	1.7291	8.9900e-003								937.8225	937.8225	0.0498		939.0672

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.5 Trenching - Tunnel Excavation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5658	25.6574	21.2637	0.0438								4,201.6657	4,201.6657	1.0135		4,227.0033
Total	2.5658	25.6574	21.2637	0.0438								4,201.6657	4,201.6657	1.0135		4,227.0033

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0620	1.7190	0.4785	5.5100e-003								591.5836	591.5836	0.0385		592.5449
Worker	0.1638	0.1070	1.0832	3.3200e-003								331.1617	331.1617	8.5100e-003		331.3745
Total	0.2258	1.8259	1.5617	8.8300e-003								922.7453	922.7453	0.0470		923.9193

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.5 Trenching - Tunnel Excavation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5658	25.6574	21.2637	0.0438							0.0000	4,201.6657	4,201.6657	1.0135		4,227.0033
Total	2.5658	25.6574	21.2637	0.0438							0.0000	4,201.6657	4,201.6657	1.0135		4,227.0033

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0620	1.7190	0.4785	5.5100e-003								591.5836	591.5836	0.0385		592.5449
Worker	0.1638	0.1070	1.0832	3.3200e-003								331.1617	331.1617	8.5100e-003		331.3745
Total	0.2258	1.8259	1.5617	8.8300e-003								922.7453	922.7453	0.0470		923.9193

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.6 Trenching - Tunnel Pipe Install - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9747	16.1397	12.4870	0.0271								2,527.5350	2,527.5350	0.5782		2,541.9891
Total	1.9747	16.1397	12.4870	0.0271								2,527.5350	2,527.5350	0.5782		2,541.9891

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2757	7.6398	2.1267	0.0245								2,629.2604	2,629.2604	0.1709		2,633.5327
Worker	0.1365	0.0892	0.9026	2.7700e-003								275.9681	275.9681	7.0900e-003		276.1454
Total	0.4122	7.7290	3.0293	0.0273								2,905.2285	2,905.2285	0.1780		2,909.6781

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.6 Trenching - Tunnel Pipe Install - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9747	16.1397	12.4870	0.0271							0.0000	2,527.5350	2,527.5350	0.5782		2,541.9891
Total	1.9747	16.1397	12.4870	0.0271							0.0000	2,527.5350	2,527.5350	0.5782		2,541.9891

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2757	7.6398	2.1267	0.0245								2,629.2604	2,629.2604	0.1709		2,633.5327
Worker	0.1365	0.0892	0.9026	2.7700e-003								275.9681	275.9681	7.0900e-003		276.1454
Total	0.4122	7.7290	3.0293	0.0273								2,905.2285	2,905.2285	0.1780		2,909.6781

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.7 Trenching - Downstream Facility Excavation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9816	9.2003	7.3287	0.0191								1,839.6807	1,839.6807	0.5818		1,854.2263
Total	0.9816	9.2003	7.3287	0.0191								1,839.6807	1,839.6807	0.5818		1,854.2263

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0138	0.3820	0.1063	1.2200e-003								131.4630	131.4630	8.5400e-003		131.6766
Worker	0.0819	0.0535	0.5416	1.6600e-003								165.5808	165.5808	4.2600e-003		165.6873
Total	0.0957	0.4355	0.6479	2.8800e-003								297.0439	297.0439	0.0128		297.3639

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.7 Trenching - Downstream Facility Excavation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9816	9.2003	7.3287	0.0191							0.0000	1,839.6807	1,839.6807	0.5818		1,854.2263
Total	0.9816	9.2003	7.3287	0.0191							0.0000	1,839.6807	1,839.6807	0.5818		1,854.2263

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0138	0.3820	0.1063	1.2200e-003								131.4630	131.4630	8.5400e-003		131.6766
Worker	0.0819	0.0535	0.5416	1.6600e-003								165.5808	165.5808	4.2600e-003		165.6873
Total	0.0957	0.4355	0.6479	2.8800e-003								297.0439	297.0439	0.0128		297.3639

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.8 Building Construction - Inclined Intake Facility Components - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3233	31.5434	23.4162	0.0601								5,800.3291	5,800.3291	1.6172		5,840.7594
Total	3.3233	31.5434	23.4162	0.0601								5,800.3291	5,800.3291	1.6172		5,840.7594

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1654	4.5839	1.2760	0.0147								1,577.5563	1,577.5563	0.1025		1,580.1196
Worker	0.1638	0.1070	1.0832	3.3200e-003								331.1617	331.1617	8.5100e-003		331.3745
Total	0.3292	4.6909	2.3592	0.0180								1,908.7179	1,908.7179	0.1110		1,911.4941

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.8 Building Construction - Inclined Intake Facility Components - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3233	31.5434	23.4162	0.0601							0.0000	5,800.3291	5,800.3291	1.6172		5,840.7594
Total	3.3233	31.5434	23.4162	0.0601							0.0000	5,800.3291	5,800.3291	1.6172		5,840.7594

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1654	4.5839	1.2760	0.0147								1,577.5563	1,577.5563	0.1025		1,580.1196
Worker	0.1638	0.1070	1.0832	3.3200e-003								331.1617	331.1617	8.5100e-003		331.3745
Total	0.3292	4.6909	2.3592	0.0180								1,908.7179	1,908.7179	0.1110		1,911.4941

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.8 Building Construction - Inclined Intake Facility Components - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.0348	27.2242	22.6878	0.0601								5,800.0789	5,800.0789	1.6105		5,840.3424
Total	3.0348	27.2242	22.6878	0.0601								5,800.0789	5,800.0789	1.6105		5,840.3424

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1343	3.9401	1.1444	0.0146								1,567.2318	1,567.2318	0.0993		1,569.7148
Worker	0.1540	0.0965	1.0006	3.2200e-003								321.2114	321.2114	7.7600e-003		321.4054
Total	0.2883	4.0366	2.1449	0.0178								1,888.4433	1,888.4433	0.1071		1,891.1202

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.8 Building Construction - Inclined Intake Facility Components - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.0348	27.2242	22.6878	0.0601							0.0000	5,800.0789	5,800.0789	1.6105		5,840.3423
Total	3.0348	27.2242	22.6878	0.0601							0.0000	5,800.0789	5,800.0789	1.6105		5,840.3423

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1343	3.9401	1.1444	0.0146								1,567.2318	1,567.2318	0.0993		1,569.7148
Worker	0.1540	0.0965	1.0006	3.2200e-003								321.2114	321.2114	7.7600e-003		321.4054
Total	0.2883	4.0366	2.1449	0.0178								1,888.4433	1,888.4433	0.1071		1,891.1202

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.9 Building Construction - Downstream Facility Components - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7186	34.7898	27.7791	0.0629								6,043.1699	6,043.1699	1.6775		6,085.1082
Total	3.7186	34.7898	27.7791	0.0629								6,043.1699	6,043.1699	1.6775		6,085.1082

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1241	3.4379	0.9570	0.0110								1,183.1672	1,183.1672	0.0769		1,185.0897
Worker	0.1638	0.1070	1.0832	3.3200e-003								331.1617	331.1617	8.5100e-003		331.3745
Total	0.2879	3.5449	2.0402	0.0143								1,514.3289	1,514.3289	0.0854		1,516.4642

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.9 Building Construction - Downstream Facility Components - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7186	34.7898	27.7791	0.0629							0.0000	6,043.1699	6,043.1699	1.6775		6,085.1082
Total	3.7186	34.7898	27.7791	0.0629							0.0000	6,043.1699	6,043.1699	1.6775		6,085.1082

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1241	3.4379	0.9570	0.0110								1,183.1672	1,183.1672	0.0769		1,185.0897
Worker	0.1638	0.1070	1.0832	3.3200e-003								331.1617	331.1617	8.5100e-003		331.3745
Total	0.2879	3.5449	2.0402	0.0143								1,514.3289	1,514.3289	0.0854		1,516.4642

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.9 Building Construction - Downstream Facility Components - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3938	30.5139	27.1134	0.0629								6,042.8461	6,042.8461	1.6690		6,084.5714
Total	3.3938	30.5139	27.1134	0.0629								6,042.8461	6,042.8461	1.6690		6,084.5714

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1007	2.9551	0.8583	0.0109								1,175.4239	1,175.4239	0.0745		1,177.2861
Worker	0.1540	0.0965	1.0006	3.2200e-003								321.2114	321.2114	7.7600e-003		321.4054
Total	0.2547	3.0515	1.8588	0.0142								1,496.6353	1,496.6353	0.0823		1,498.6915

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.9 Building Construction - Downstream Facility Components - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3938	30.5139	27.1134	0.0629							0.0000	6,042.8461	6,042.8461	1.6690		6,084.5714
Total	3.3938	30.5139	27.1134	0.0629							0.0000	6,042.8461	6,042.8461	1.6690		6,084.5714

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1007	2.9551	0.8583	0.0109								1,175.4239	1,175.4239	0.0745		1,177.2861
Worker	0.1540	0.0965	1.0006	3.2200e-003								321.2114	321.2114	7.7600e-003		321.4054
Total	0.2547	3.0515	1.8588	0.0142								1,496.6353	1,496.6353	0.0823		1,498.6915

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.10 Demolition - Remove Intake Facility Cofferdam - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2450	2.4126	3.2678	5.1700e-003								500.1184	500.1184	0.1618		504.1621
Total	0.2450	2.4126	3.2678	5.1700e-003								500.1184	500.1184	0.1618		504.1621

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0345	0.9550	0.2658	3.0600e-003								328.6576	328.6576	0.0214		329.1916
Worker	0.0546	0.0357	0.3611	1.1100e-003								110.3872	110.3872	2.8400e-003		110.4582
Total	0.0891	0.9906	0.6269	4.1700e-003								439.0448	439.0448	0.0242		439.6497

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.10 Demolition - Remove Intake Facility Cofferdam - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2450	2.4126	3.2678	5.1700e-003							0.0000	500.1184	500.1184	0.1618		504.1621
Total	0.2450	2.4126	3.2678	5.1700e-003							0.0000	500.1184	500.1184	0.1618		504.1621

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0345	0.9550	0.2658	3.0600e-003								328.6576	328.6576	0.0214		329.1916
Worker	0.0546	0.0357	0.3611	1.1100e-003								110.3872	110.3872	2.8400e-003		110.4582
Total	0.0891	0.9906	0.6269	4.1700e-003								439.0448	439.0448	0.0242		439.6497

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.11 Demolition - Abandon Existing Outlet Works - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7755	15.5189	11.5219	0.0369								3,558.1479	3,558.1479	1.1376		3,586.5881
Total	1.7755	15.5189	11.5219	0.0369								3,558.1479	3,558.1479	1.1376		3,586.5881

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1119	3.2834	0.9536	0.0122								1,306.0265	1,306.0265	0.0828		1,308.0957
Worker	0.1284	0.0804	0.8338	2.6900e-003								267.6762	267.6762	6.4600e-003		267.8378
Total	0.2403	3.3638	1.7874	0.0148								1,573.7027	1,573.7027	0.0892		1,575.9335

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.11 Demolition - Abandon Existing Outlet Works - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7755	15.5189	11.5219	0.0369							0.0000	3,558.1479	3,558.1479	1.1376		3,586.5881
Total	1.7755	15.5189	11.5219	0.0369							0.0000	3,558.1479	3,558.1479	1.1376		3,586.5881

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1119	3.2834	0.9536	0.0122								1,306.0265	1,306.0265	0.0828		1,308.0957
Worker	0.1284	0.0804	0.8338	2.6900e-003								267.6762	267.6762	6.4600e-003		267.8378
Total	0.2403	3.3638	1.7874	0.0148								1,573.7027	1,573.7027	0.0892		1,575.9335

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.12 Site Preparation - Demobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.1375	19.5599	17.7768	0.0428								4,128.2281	4,128.2281	1.3220		4,161.2777
Total	2.1375	19.5599	17.7768	0.0428								4,128.2281	4,128.2281	1.3220		4,161.2777

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0727	2.1342	0.6199	7.9000e-003								848.9172	848.9172	0.0538		850.2622
Worker	0.1540	0.0965	1.0006	3.2200e-003								321.2114	321.2114	7.7600e-003		321.4054
Total	0.2268	2.2307	1.6204	0.0111								1,170.1287	1,170.1287	0.0616		1,171.6676

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

3.12 Site Preparation - Demobilization - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.1375	19.5599	17.7768	0.0428							0.0000	4,128.2281	4,128.2281	1.3220		4,161.2777
Total	2.1375	19.5599	17.7768	0.0428							0.0000	4,128.2281	4,128.2281	1.3220		4,161.2777

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0727	2.1342	0.6199	7.9000e-003								848.9172	848.9172	0.0538		850.2622
Worker	0.1540	0.0965	1.0006	3.2200e-003								321.2114	321.2114	7.7600e-003		321.4054
Total	0.2268	2.2307	1.6204	0.0111								1,170.1287	1,170.1287	0.0616		1,171.6676

4.0 Operational Detail - Mobile

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.4284	1.9576	6.3040	0.0220								2,227.9737	2,227.9737	0.0900		2,230.2239
Unmitigated	0.4284	1.9576	6.3040	0.0220								2,227.9737	2,227.9737	0.0900		2,230.2239

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
General Light Industry	255.03	48.30	24.88	744,182	744,182
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	255.03	48.30	24.88	744,182	744,182

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Other Asphalt Surfaces	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Other Non-Asphalt Surfaces	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866
NaturalGas Unmitigated	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	2102.19	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	2.10219	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866

6.0 Area Detail

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Mitigated	1.9475	4.0000e-005	4.1100e-003	0.0000								8.7800e-003	8.7800e-003	2.0000e-005			9.3600e-003
Unmitigated	1.9475	4.0000e-005	4.1100e-003	0.0000								8.7800e-003	8.7800e-003	2.0000e-005			9.3600e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.1096												0.0000			0.0000
Consumer Products	0.8375												0.0000			0.0000
Landscaping	3.8000e-004	4.0000e-005	4.1100e-003	0.0000								8.7800e-003	8.7800e-003	2.0000e-005		9.3600e-003
Total	1.9475	4.0000e-005	4.1100e-003	0.0000								8.7800e-003	8.7800e-003	2.0000e-005		9.3600e-003

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.1096												0.0000			0.0000
Consumer Products	0.8375												0.0000			0.0000
Landscaping	3.8000e-004	4.0000e-005	4.1100e-003	0.0000								8.7800e-003	8.7800e-003	2.0000e-005		9.3600e-003
Total	1.9475	4.0000e-005	4.1100e-003	0.0000								8.7800e-003	8.7800e-003	2.0000e-005		9.3600e-003

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

Fire Pumps and Emergency Generators

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Winter

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

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

User Defined Equipment

Equipment Type	Number
----------------	--------

11.0 Vegetation

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

**Santa Felicia Dam Outlet Works Alt 2
Ventura County, Summer**

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	36.59	1000sqft	0.84	36,590.40	0
Other Asphalt Surfaces	0.56	Acre	0.56	24,393.60	0
Other Non-Asphalt Surfaces	3.14	Acre	3.14	136,778.40	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

Project Characteristics - Start of construction based on the schedule provided in the Constructability Analysis report.

Land Use - Acreage based on Constructability Analysis figures.

Construction Phase - Schedule based on Constructability Analysis, Table 3-1.

Off-road Equipment - Concrete Pump Truck, Water Truck, and Flatbed= Off-highway Truck.

Off-road Equipment - Construction equipment based on Constructability Analysis reports.

Off-road Equipment - Construction equipment based on Constructability Analysis reports.

Off-road Equipment - Construction equipment based on Constructability Analysis reports.

Off-road Equipment - Construction equipment based on Constructability Analysis reports.

Trips and VMT - Trip details based on Constructability Analysis report. Assumes worker and vendor trips are from the cities of Castaic and Santa Clarita, approximately 20 miles to the east.

Grading -

Area Coating -

Energy Use -

Construction Off-road Equipment Mitigation -

Off-road Equipment - 1

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	18295	90387
tblAreaCoating	Area_Nonresidential_Interior	54886	271161
tblAreaCoating	Area_Parking	9670	1045
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblLandUse	BuildingSpaceSquareFeet	36,590.00	36,590.40
tblLandUse	LandUseSquareFeet	36,590.00	36,590.40
tblOffRoadEquipment	HorsePower	124.00	46.00
tblOffRoadEquipment	LoadFactor	0.44	0.45
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Site Preparation - Mobilization
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Grading - Access Roads and Pad
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Grading - Access Roads and Pad
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Site Preparation - Mobilization
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Grading - Access Roads and Pad

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

tblOffRoadEquipment	PhaseName		Site Preparation - Mobilization
tblOffRoadEquipment	PhaseName		Grading - Access Roads and Pad
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Site Preparation - Mobilization
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Grading - Access Roads and Pad
tblOffRoadEquipment	PhaseName		Site Preparation - Mobilization
tblOffRoadEquipment	PhaseName		Grading - Access Roads and Pad
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblProjectCharacteristics	OperationalYear	2018	2021
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripNumber	18.00	20.00
tblTripsAndVMT	WorkerTripNumber	13.00	20.00
tblTripsAndVMT	WorkerTripNumber	18.00	24.00
tblTripsAndVMT	WorkerTripNumber	25.00	24.00
tblTripsAndVMT	WorkerTripNumber	25.00	24.00
tblTripsAndVMT	WorkerTripNumber	23.00	24.00
tblTripsAndVMT	WorkerTripNumber	15.00	20.00
tblTripsAndVMT	WorkerTripNumber	83.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	12.00
tblTripsAndVMT	WorkerTripNumber	83.00	24.00
tblTripsAndVMT	WorkerTripNumber	3.00	8.00

2.0 Emissions Summary

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	8.7974	88.5154	67.4766	0.1587							0.0000	15,695.7976	15,695.7976	3.2442	0.0000	15,776.9007
2020	8.1097	80.5998	66.1442	0.1646							0.0000	16,258.8013	16,258.8013	3.5441	0.0000	16,347.4029
2021	6.9904	66.9601	54.4209	0.1641							0.0000	16,213.1128	16,213.1128	3.5203	0.0000	16,301.1192
2022	2.0587	17.7741	18.7430	0.0539							0.0000	5,304.3167	5,304.3167	1.3808	0.0000	5,338.8367
Maximum	8.7974	88.5154	67.4766	0.1646							0.0000	16,258.8013	16,258.8013	3.5441	0.0000	16,347.4029

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.9916	4.0000e-005	4.1300e-003	0.0000								8.8200e-003	8.8200e-003	2.0000e-005		9.4000e-003
Energy	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866
Mobile	0.4488	1.8590	6.3619	0.0230								2,323.4690	2,323.4690	0.0897		2,325.7107
Total	2.4631	2.0652	6.5392	0.0242								2,570.7948	2,570.7948	0.0944	4.5300e-003	2,574.5067

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.9916	4.0000e-005	4.1300e-003	0.0000								8.8200e-003	8.8200e-003	2.0000e-005		9.4000e-003
Energy	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866
Mobile	0.4488	1.8590	6.3619	0.0230								2,323.4690	2,323.4690	0.0897		2,325.7107
Total	2.4631	2.0652	6.5392	0.0242								2,570.7948	2,570.7948	0.0944	4.5300e-003	2,574.5067

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation - Mobilization	Site Preparation	8/1/2019	8/31/2019	5	22	
2	Grading - Access Roads and Pad	Grading	9/1/2019	2/29/2020	5	130	
3	Trenching - Intake Facility Excavation	Trenching	11/1/2019	4/30/2020	5	130	
4	Trenching - Tunnel Excavation	Trenching	11/1/2019	4/30/2020	5	130	
5	Trenching - Tunnel Pipe Install	Trenching	5/1/2020	8/31/2020	5	87	
6	Building Construction - Intake Tower and Ancillary Facilities	Building Construction	9/1/2020	9/30/2021	5	283	
7	Trenching - Downstream Facility Excavation	Trenching	11/1/2020	11/30/2020	5	21	
8	Building Construction - Downstream Facility Components	Building Construction	12/1/2020	7/31/2021	5	174	
9	Demolition - Remove Intake Facility Cofferdam	Demolition	10/1/2021	11/30/2021	5	43	
10	Demolition - Abandon Existing Outlet Works	Demolition	5/1/2022	6/30/2022	5	44	
11	Site Preparation - Demobilization	Site Preparation	7/1/2022	7/31/2022	5	21	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 3.7

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation - Mobilization	Air Compressors	0	6.00	78	0.48
Site Preparation - Mobilization	Excavators	1	4.00	158	0.38
Site Preparation - Mobilization	Generator Sets	1	4.00	84	0.74
Site Preparation - Mobilization	Graders	1	4.00	187	0.41
Site Preparation - Mobilization	Off-Highway Trucks	2	8.00	402	0.38
Site Preparation - Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation - Mobilization	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Site Preparation - Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading - Access Roads and Pad	Cranes	0	7.00	231	0.29
Grading - Access Roads and Pad	Dumpers/Tenders	1	8.00	16	0.38
Grading - Access Roads and Pad	Excavators	1	4.00	158	0.38
Grading - Access Roads and Pad	Forklifts	0	8.00	89	0.20
Grading - Access Roads and Pad	Generator Sets	1	8.00	84	0.74
Grading - Access Roads and Pad	Graders	1	8.00	187	0.41
Grading - Access Roads and Pad	Off-Highway Tractors	2	4.00	46	0.45
Grading - Access Roads and Pad	Off-Highway Trucks	1	8.00	402	0.38
Grading - Access Roads and Pad	Rubber Tired Dozers	0	8.00	247	0.40
Grading - Access Roads and Pad	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Trenching - Intake Facility Excavation	Aerial Lifts	1	8.00	63	0.31
Trenching - Intake Facility Excavation	Concrete/Industrial Saws	0	8.00	81	0.73
Trenching - Intake Facility Excavation	Cranes	1	4.00	231	0.29
Trenching - Intake Facility Excavation	Dumpers/Tenders	2	8.00	16	0.38
Trenching - Intake Facility Excavation	Excavators	1	8.00	158	0.38
Trenching - Intake Facility Excavation	Generator Sets	2	8.00	84	0.74
Trenching - Intake Facility Excavation	Off-Highway Trucks	1	8.00	402	0.38

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

Trenching - Intake Facility Excavation	Rubber Tired Dozers	0	8.00	247	0.40
Trenching - Intake Facility Excavation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching - Tunnel Excavation	Aerial Lifts	1	4.00	63	0.31
Trenching - Tunnel Excavation	Bore/Drill Rigs	1	8.00	221	0.50
Trenching - Tunnel Excavation	Crawler Tractors	1	8.00	212	0.43
Trenching - Tunnel Excavation	Crushing/Proc. Equipment	1	8.00	85	0.78
Trenching - Tunnel Excavation	Dumpers/Tenders	1	8.00	16	0.38
Trenching - Tunnel Excavation	Excavators	1	8.00	158	0.38
Trenching - Tunnel Excavation	Generator Sets	1	8.00	84	0.74
Trenching - Tunnel Excavation	Graders	0	8.00	187	0.41
Trenching - Tunnel Excavation	Rubber Tired Dozers	0	8.00	247	0.40
Trenching - Tunnel Excavation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching - Tunnel Pipe Install	Cement and Mortar Mixers	0	6.00	9	0.56
Trenching - Tunnel Pipe Install	Crawler Tractors	1	4.00	212	0.43
Trenching - Tunnel Pipe Install	Generator Sets	1	8.00	84	0.74
Trenching - Tunnel Pipe Install	Off-Highway Trucks	1	6.00	402	0.38
Trenching - Tunnel Pipe Install	Pavers	0	8.00	130	0.42
Trenching - Tunnel Pipe Install	Paving Equipment	0	6.00	132	0.36
Trenching - Tunnel Pipe Install	Rollers	0	6.00	80	0.38
Trenching - Tunnel Pipe Install	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Trenching - Tunnel Pipe Install	Welders	2	8.00	46	0.45
Building Construction - Intake Tower and Ancillary Facilities	Aerial Lifts	1	4.00	63	0.31
Building Construction - Intake Tower and Ancillary Facilities	Air Compressors	1	8.00	78	0.48
Building Construction - Intake Tower and Ancillary Facilities	Cranes	1	4.00	231	0.29
Building Construction - Intake Tower and Ancillary Facilities	Forklifts	0	8.00	89	0.20
Building Construction - Intake Tower and Ancillary Facilities	Generator Sets	1	8.00	84	0.74

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

Building Construction - Intake Tower and Ancillary Facilities	Off-Highway Tractors	1	8.00	124	0.44
Building Construction - Intake Tower and Ancillary Facilities	Off-Highway Trucks	3	8.00	402	0.38
Building Construction - Intake Tower and Ancillary Facilities	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Building Construction - Intake Tower and Ancillary Facilities	Welders	0	8.00	46	0.45
Trenching - Downstream Facility Excavation	Dumpers/Tenders	1	8.00	16	0.38
Trenching - Downstream Facility Excavation	Excavators	1	8.00	158	0.38
Trenching - Downstream Facility Excavation	Off-Highway Trucks	1	8.00	402	0.38
Trenching - Downstream Facility Excavation	Rubber Tired Dozers	0	8.00	247	0.40
Trenching - Downstream Facility Excavation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction - Downstream Facility Components	Air Compressors	1	8.00	78	0.48
Building Construction - Downstream Facility Components	Cranes	0	7.00	231	0.29
Building Construction - Downstream Facility Components	Cranes	1	4.00	231	0.29
Building Construction - Downstream Facility Components	Forklifts	0	8.00	89	0.20
Building Construction - Downstream Facility Components	Generator Sets	1	8.00	84	0.74
Building Construction - Downstream Facility Components	Off-Highway Tractors	1	8.00	124	0.44
Building Construction - Downstream Facility Components	Off-Highway Trucks	1	4.00	402	0.38
Building Construction - Downstream Facility Components	Off-Highway Trucks	2	8.00	402	0.38
Building Construction - Downstream Facility Components	Pavers	1	8.00	130	0.42
Building Construction - Downstream Facility Components	Rollers	1	8.00	80	0.38
Building Construction - Downstream Facility Components	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction - Downstream Facility Components	Welders	1	4.00	46	0.45
Demolition - Remove Intake Facility Cofferdam	Concrete/Industrial Saws	0	8.00	81	0.73

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

Demolition - Remove Intake Facility Cofferdam	Excavators	1	8.00	158	0.38
Demolition - Remove Intake Facility Cofferdam	Rubber Tired Dozers	0	8.00	247	0.40
Demolition - Abandon Existing Outlet Works	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition - Abandon Existing Outlet Works	Dumpers/Tenders	1	8.00	16	0.38
Demolition - Abandon Existing Outlet Works	Excavators	0	8.00	158	0.38
Demolition - Abandon Existing Outlet Works	Off-Highway Trucks	1	4.00	402	0.38
Demolition - Abandon Existing Outlet Works	Off-Highway Trucks	2	8.00	402	0.38
Demolition - Abandon Existing Outlet Works	Rubber Tired Dozers	0	8.00	247	0.40
Demolition - Abandon Existing Outlet Works	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation - Demobilization	Dumpers/Tenders	1	8.00	16	0.38
Site Preparation - Demobilization	Excavators	1	8.00	158	0.38
Site Preparation - Demobilization	Off-Highway Trucks	2	8.00	402	0.38
Site Preparation - Demobilization	Pavers	1	8.00	130	0.42
Site Preparation - Demobilization	Rollers	1	8.00	80	0.38
Site Preparation - Demobilization	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation - Demobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation - Mobilization	7	20.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading - Access Roads and Pad	10	24.00	11.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Intake Facility Excavation	10	24.00	14.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Tunnel Excavation	9	24.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Tunnel Pipe Install	6	20.00	40.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction - Intake Tower and Ancill	9	24.00	38.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Downstream Facility Ex	3	12.00	2.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction - Downstream Facility C	11	24.00	18.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demolition - Remove Intake Facility Cofferdam	1	8.00	5.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demolition - Abandon Existing Outlet Works	5	20.00	19.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation - Demobilization	7	24.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.2 Site Preparation - Mobilization - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.3647	24.4049	15.8598	0.0403								3,972.6695	3,972.6695	1.1781		4,002.1216
Total	2.3647	24.4049	15.8598	0.0403								3,972.6695	3,972.6695	1.1781		4,002.1216

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0745	1.9471	0.5070	5.6100e-003								601.8207	601.8207	0.0389		602.7918
Worker	0.1245	0.0851	1.0425	3.0100e-003								299.6187	299.6187	8.3400e-003		299.8272
Total	0.1989	2.0322	1.5495	8.6200e-003								901.4394	901.4394	0.0472		902.6190

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.2 Site Preparation - Mobilization - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.3647	24.4049	15.8598	0.0403							0.0000	3,972.6695	3,972.6695	1.1781		4,002.1216
Total	2.3647	24.4049	15.8598	0.0403							0.0000	3,972.6695	3,972.6695	1.1781		4,002.1216

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0745	1.9471	0.5070	5.6100e-003								601.8207	601.8207	0.0389		602.7918
Worker	0.1245	0.0851	1.0425	3.0100e-003								299.6187	299.6187	8.3400e-003		299.8272
Total	0.1989	2.0322	1.5495	8.6200e-003								901.4394	901.4394	0.0472		902.6190

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.3 Grading - Access Roads and Pad - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.5430	26.3656	18.3484	0.0391								3,827.5219	3,827.5219	1.0406		3,853.5368
Total	2.5430	26.3656	18.3484	0.0391								3,827.5219	3,827.5219	1.0406		3,853.5368

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0910	2.3798	0.6197	6.8600e-003								735.5586	735.5586	0.0475		736.7455
Worker	0.1494	0.1021	1.2510	3.6100e-003								359.5425	359.5425	0.0100		359.7927
Total	0.2404	2.4819	1.8706	0.0105								1,095.1011	1,095.1011	0.0575		1,096.5382

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.3 Grading - Access Roads and Pad - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.5430	26.3656	18.3484	0.0391							0.0000	3,827.5219	3,827.5219	1.0406		3,853.5368
Total	2.5430	26.3656	18.3484	0.0391							0.0000	3,827.5219	3,827.5219	1.0406		3,853.5368

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0910	2.3798	0.6197	6.8600e-003								735.5586	735.5586	0.0475		736.7455
Worker	0.1494	0.1021	1.2510	3.6100e-003								359.5425	359.5425	0.0100		359.7927
Total	0.2404	2.4819	1.8706	0.0105								1,095.1011	1,095.1011	0.0575		1,096.5382

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.3 Grading - Access Roads and Pad - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.3625	24.1136	18.0539	0.0391								3,757.6803	3,757.6803	1.0357		3,783.5733
Total	2.3625	24.1136	18.0539	0.0391								3,757.6803	3,757.6803	1.0357		3,783.5733

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0732	2.0650	0.5502	6.8000e-003								730.5089	730.5089	0.0455		731.6454
Worker	0.1390	0.0913	1.1413	3.4900e-003								348.1739	348.1739	8.9400e-003		348.3974
Total	0.2121	2.1563	1.6915	0.0103								1,078.6828	1,078.6828	0.0544		1,080.0429

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.3 Grading - Access Roads and Pad - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.3625	24.1136	18.0539	0.0391							0.0000	3,757.6803	3,757.6803	1.0357		3,783.5733
Total	2.3625	24.1136	18.0539	0.0391							0.0000	3,757.6803	3,757.6803	1.0357		3,783.5733

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0732	2.0650	0.5502	6.8000e-003								730.5089	730.5089	0.0455		731.6454
Worker	0.1390	0.0913	1.1413	3.4900e-003								348.1739	348.1739	8.9400e-003		348.3974
Total	0.2121	2.1563	1.6915	0.0103								1,078.6828	1,078.6828	0.0544		1,080.0429

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.4 Trenching - Intake Facility Excavation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.7641	26.7173	22.0525	0.0438								4,253.7295	4,253.7295	1.0051		4,278.8557
Total	2.7641	26.7173	22.0525	0.0438								4,253.7295	4,253.7295	1.0051		4,278.8557

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1159	3.0289	0.7887	8.7300e-003								936.1655	936.1655	0.0604		937.6761
Worker	0.1494	0.1021	1.2510	3.6100e-003								359.5425	359.5425	0.0100		359.7927
Total	0.2652	3.1310	2.0397	0.0123								1,295.7079	1,295.7079	0.0704		1,297.4688

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.4 Trenching - Intake Facility Excavation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.7641	26.7173	22.0525	0.0438							0.0000	4,253.7295	4,253.7295	1.0051		4,278.8557
Total	2.7641	26.7173	22.0525	0.0438							0.0000	4,253.7295	4,253.7295	1.0051		4,278.8557

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1159	3.0289	0.7887	8.7300e-003								936.1655	936.1655	0.0604		937.6761
Worker	0.1494	0.1021	1.2510	3.6100e-003								359.5425	359.5425	0.0100		359.7927
Total	0.2652	3.1310	2.0397	0.0123								1,295.7079	1,295.7079	0.0704		1,297.4688

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.4 Trenching - Intake Facility Excavation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5384	24.1722	21.7020	0.0438								4,190.2419	4,190.2419	0.9960		4,215.1427
Total	2.5384	24.1722	21.7020	0.0438								4,190.2419	4,190.2419	0.9960		4,215.1427

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0931	2.6282	0.7003	8.6600e-003								929.7386	929.7386	0.0579		931.1851
Worker	0.1390	0.0913	1.1413	3.4900e-003								348.1739	348.1739	8.9400e-003		348.3974
Total	0.2321	2.7195	1.8416	0.0122								1,277.9125	1,277.9125	0.0668		1,279.5825

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.4 Trenching - Intake Facility Excavation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5384	24.1722	21.7020	0.0438							0.0000	4,190.2419	4,190.2419	0.9960		4,215.1427
Total	2.5384	24.1722	21.7020	0.0438							0.0000	4,190.2419	4,190.2419	0.9960		4,215.1427

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0931	2.6282	0.7003	8.6600e-003								929.7386	929.7386	0.0579		931.1851
Worker	0.1390	0.0913	1.1413	3.4900e-003								348.1739	348.1739	8.9400e-003		348.3974
Total	0.2321	2.7195	1.8416	0.0122								1,277.9125	1,277.9125	0.0668		1,279.5825

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.5 Trenching - Tunnel Excavation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.7609	27.7704	21.4076	0.0438								4,262.3740	4,262.3740	1.0217		4,287.9169
Total	2.7609	27.7704	21.4076	0.0438								4,262.3740	4,262.3740	1.0217		4,287.9169

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0745	1.9471	0.5070	5.6100e-003								601.8207	601.8207	0.0389		602.7918
Worker	0.1494	0.1021	1.2510	3.6100e-003								359.5425	359.5425	0.0100		359.7927
Total	0.2238	2.0492	1.7580	9.2200e-003								961.3631	961.3631	0.0489		962.5844

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.5 Trenching - Tunnel Excavation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.7609	27.7704	21.4076	0.0438							0.0000	4,262.3740	4,262.3740	1.0217		4,287.9169
Total	2.7609	27.7704	21.4076	0.0438							0.0000	4,262.3740	4,262.3740	1.0217		4,287.9169

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0745	1.9471	0.5070	5.6100e-003								601.8207	601.8207	0.0389		602.7918
Worker	0.1494	0.1021	1.2510	3.6100e-003								359.5425	359.5425	0.0100		359.7927
Total	0.2238	2.0492	1.7580	9.2200e-003								961.3631	961.3631	0.0489		962.5844

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.5 Trenching - Tunnel Excavation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5658	25.6574	21.2637	0.0438								4,201.6657	4,201.6657	1.0135		4,227.0033
Total	2.5658	25.6574	21.2637	0.0438								4,201.6657	4,201.6657	1.0135		4,227.0033

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0599	1.6896	0.4502	5.5700e-003								597.6891	597.6891	0.0372		598.6190
Worker	0.1390	0.0913	1.1413	3.4900e-003								348.1739	348.1739	8.9400e-003		348.3974
Total	0.1988	1.7808	1.5915	9.0600e-003								945.8630	945.8630	0.0461		947.0164

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.5 Trenching - Tunnel Excavation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5658	25.6574	21.2637	0.0438							0.0000	4,201.6657	4,201.6657	1.0135		4,227.0033
Total	2.5658	25.6574	21.2637	0.0438							0.0000	4,201.6657	4,201.6657	1.0135		4,227.0033

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0599	1.6896	0.4502	5.5700e-003								597.6891	597.6891	0.0372		598.6190
Worker	0.1390	0.0913	1.1413	3.4900e-003								348.1739	348.1739	8.9400e-003		348.3974
Total	0.1988	1.7808	1.5915	9.0600e-003								945.8630	945.8630	0.0461		947.0164

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.6 Trenching - Tunnel Pipe Install - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9747	16.1397	12.4870	0.0271								2,527.5350	2,527.5350	0.5782		2,541.9891
Total	1.9747	16.1397	12.4870	0.0271								2,527.5350	2,527.5350	0.5782		2,541.9891

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2661	7.5092	2.0008	0.0247								2,656.3961	2,656.3961	0.1653		2,660.5289
Worker	0.1158	0.0760	0.9511	2.9100e-003								290.1449	290.1449	7.4500e-003		290.3312
Total	0.3819	7.5852	2.9519	0.0277								2,946.5410	2,946.5410	0.1728		2,950.8601

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.6 Trenching - Tunnel Pipe Install - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9747	16.1397	12.4870	0.0271							0.0000	2,527.5350	2,527.5350	0.5782		2,541.9891
Total	1.9747	16.1397	12.4870	0.0271							0.0000	2,527.5350	2,527.5350	0.5782		2,541.9891

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2661	7.5092	2.0008	0.0247								2,656.3961	2,656.3961	0.1653		2,660.5289
Worker	0.1158	0.0760	0.9511	2.9100e-003								290.1449	290.1449	7.4500e-003		290.3312
Total	0.3819	7.5852	2.9519	0.0277								2,946.5410	2,946.5410	0.1728		2,950.8601

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.7 Building Construction - Intake Tower and Ancillary Facilities - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3233	31.5434	23.4162	0.0601								5,800.3291	5,800.3291	1.6172		5,840.7594
Total	3.3233	31.5434	23.4162	0.0601								5,800.3291	5,800.3291	1.6172		5,840.7594

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2528	7.1337	1.9007	0.0235								2,523.5763	2,523.5763	0.1571		2,527.5024
Worker	0.1390	0.0913	1.1413	3.4900e-003								348.1739	348.1739	8.9400e-003		348.3974
Total	0.3917	7.2250	3.0420	0.0270								2,871.7502	2,871.7502	0.1660		2,875.8999

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.7 Building Construction - Intake Tower and Ancillary Facilities - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3233	31.5434	23.4162	0.0601							0.0000	5,800.3291	5,800.3291	1.6172		5,840.7594
Total	3.3233	31.5434	23.4162	0.0601							0.0000	5,800.3291	5,800.3291	1.6172		5,840.7594

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2528	7.1337	1.9007	0.0235								2,523.5763	2,523.5763	0.1571		2,527.5024
Worker	0.1390	0.0913	1.1413	3.4900e-003								348.1739	348.1739	8.9400e-003		348.3974
Total	0.3917	7.2250	3.0420	0.0270								2,871.7502	2,871.7502	0.1660		2,875.8999

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.7 Building Construction - Intake Tower and Ancillary Facilities - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.0348	27.2242	22.6878	0.0601								5,800.0789	5,800.0789	1.6105		5,840.3424
Total	3.0348	27.2242	22.6878	0.0601								5,800.0789	5,800.0789	1.6105		5,840.3424

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2041	6.1461	1.7011	0.0233								2,507.1468	2,507.1468	0.1523		2,510.9532
Worker	0.1305	0.0823	1.0564	3.3900e-003								337.7226	337.7226	8.1600e-003		337.9267
Total	0.3347	6.2284	2.7575	0.0267								2,844.8694	2,844.8694	0.1604		2,848.8799

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.7 Building Construction - Intake Tower and Ancillary Facilities - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.0348	27.2242	22.6878	0.0601							0.0000	5,800.0789	5,800.0789	1.6105		5,840.3423
Total	3.0348	27.2242	22.6878	0.0601							0.0000	5,800.0789	5,800.0789	1.6105		5,840.3423

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2041	6.1461	1.7011	0.0233								2,507.1468	2,507.1468	0.1523		2,510.9532
Worker	0.1305	0.0823	1.0564	3.3900e-003								337.7226	337.7226	8.1600e-003		337.9267
Total	0.3347	6.2284	2.7575	0.0267								2,844.8694	2,844.8694	0.1604		2,848.8799

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.8 Trenching - Downstream Facility Excavation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9816	9.2003	7.3287	0.0191								1,839.6807	1,839.6807	0.5818		1,854.2263
Total	0.9816	9.2003	7.3287	0.0191								1,839.6807	1,839.6807	0.5818		1,854.2263

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0133	0.3755	0.1000	1.2400e-003								132.8198	132.8198	8.2700e-003		133.0264
Worker	0.0695	0.0456	0.5707	1.7500e-003								174.0870	174.0870	4.4700e-003		174.1987
Total	0.0828	0.4211	0.6707	2.9900e-003								306.9068	306.9068	0.0127		307.2252

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.8 Trenching - Downstream Facility Excavation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9816	9.2003	7.3287	0.0191							0.0000	1,839.6807	1,839.6807	0.5818		1,854.2263
Total	0.9816	9.2003	7.3287	0.0191							0.0000	1,839.6807	1,839.6807	0.5818		1,854.2263

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0133	0.3755	0.1000	1.2400e-003								132.8198	132.8198	8.2700e-003		133.0264
Worker	0.0695	0.0456	0.5707	1.7500e-003								174.0870	174.0870	4.4700e-003		174.1987
Total	0.0828	0.4211	0.6707	2.9900e-003								306.9068	306.9068	0.0127		307.2252

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.9 Building Construction - Downstream Facility Components - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7186	34.7898	27.7791	0.0629								6,043.1699	6,043.1699	1.6775		6,085.1082
Total	3.7186	34.7898	27.7791	0.0629								6,043.1699	6,043.1699	1.6775		6,085.1082

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1197	3.3791	0.9003	0.0111								1,195.3783	1,195.3783	0.0744		1,197.2380
Worker	0.1390	0.0913	1.1413	3.4900e-003								348.1739	348.1739	8.9400e-003		348.3974
Total	0.2587	3.4704	2.0417	0.0146								1,543.5521	1,543.5521	0.0833		1,545.6354

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.9 Building Construction - Downstream Facility Components - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7186	34.7898	27.7791	0.0629							0.0000	6,043.1699	6,043.1699	1.6775		6,085.1082
Total	3.7186	34.7898	27.7791	0.0629							0.0000	6,043.1699	6,043.1699	1.6775		6,085.1082

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1197	3.3791	0.9003	0.0111								1,195.3783	1,195.3783	0.0744		1,197.2380
Worker	0.1390	0.0913	1.1413	3.4900e-003								348.1739	348.1739	8.9400e-003		348.3974
Total	0.2587	3.4704	2.0417	0.0146								1,543.5521	1,543.5521	0.0833		1,545.6354

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.9 Building Construction - Downstream Facility Components - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3938	30.5139	27.1134	0.0629								6,042.8461	6,042.8461	1.6690		6,084.5714
Total	3.3938	30.5139	27.1134	0.0629								6,042.8461	6,042.8461	1.6690		6,084.5714

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0967	2.9113	0.8058	0.0111								1,187.5958	1,187.5958	0.0721		1,189.3989
Worker	0.1305	0.0823	1.0564	3.3900e-003								337.7226	337.7226	8.1600e-003		337.9267
Total	0.2272	2.9936	1.8622	0.0144								1,525.3184	1,525.3184	0.0803		1,527.3256

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.9 Building Construction - Downstream Facility Components - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3938	30.5139	27.1134	0.0629							0.0000	6,042.8461	6,042.8461	1.6690		6,084.5714
Total	3.3938	30.5139	27.1134	0.0629							0.0000	6,042.8461	6,042.8461	1.6690		6,084.5714

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0967	2.9113	0.8058	0.0111								1,187.5958	1,187.5958	0.0721		1,189.3989
Worker	0.1305	0.0823	1.0564	3.3900e-003								337.7226	337.7226	8.1600e-003		337.9267
Total	0.2272	2.9936	1.8622	0.0144								1,525.3184	1,525.3184	0.0803		1,527.3256

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.10 Demolition - Remove Intake Facility Cofferdam - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2292	2.1534	3.2718	5.1700e-003								500.1920	500.1920	0.1618		504.2363
Total	0.2292	2.1534	3.2718	5.1700e-003								500.1920	500.1920	0.1618		504.2363

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0269	0.8087	0.2238	3.0700e-003								329.8877	329.8877	0.0200		330.3886
Worker	0.0435	0.0274	0.3521	1.1300e-003								112.5742	112.5742	2.7200e-003		112.6422
Total	0.0704	0.8361	0.5760	4.2000e-003								442.4619	442.4619	0.0228		443.0308

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.10 Demolition - Remove Intake Facility Cofferdam - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2292	2.1534	3.2718	5.1700e-003							0.0000	500.1920	500.1920	0.1618		504.2363
Total	0.2292	2.1534	3.2718	5.1700e-003							0.0000	500.1920	500.1920	0.1618		504.2363

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0269	0.8087	0.2238	3.0700e-003								329.8877	329.8877	0.0200		330.3886
Worker	0.0435	0.0274	0.3521	1.1300e-003								112.5742	112.5742	2.7200e-003		112.6422
Total	0.0704	0.8361	0.5760	4.2000e-003								442.4619	442.4619	0.0228		443.0308

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.11 Demolition - Abandon Existing Outlet Works - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5592	12.1745	10.8856	0.0369								3,559.6425	3,559.6425	1.1381		3,588.0948
Total	1.5592	12.1745	10.8856	0.0369								3,559.6425	3,559.6425	1.1381		3,588.0948

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0951	2.8214	0.8157	0.0115								1,241.5745	1,241.5745	0.0746		1,243.4382
Worker	0.1025	0.0620	0.8161	2.7200e-003								271.0762	271.0762	6.1600e-003		271.2302
Total	0.1976	2.8834	1.6317	0.0143								1,512.6507	1,512.6507	0.0807		1,514.6684

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.11 Demolition - Abandon Existing Outlet Works - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5592	12.1745	10.8856	0.0369							0.0000	3,559.6425	3,559.6425	1.1381		3,588.0948
Total	1.5592	12.1745	10.8856	0.0369							0.0000	3,559.6425	3,559.6425	1.1381		3,588.0948

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0951	2.8214	0.8157	0.0115								1,241.5745	1,241.5745	0.0746		1,243.4382
Worker	0.1025	0.0620	0.8161	2.7200e-003								271.0762	271.0762	6.1600e-003		271.2302
Total	0.1976	2.8834	1.6317	0.0143								1,512.6507	1,512.6507	0.0807		1,514.6684

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.12 Site Preparation - Demobilization - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	1.8706	15.7694	17.2056	0.0428								4,129.5269	4,129.5269	1.3224		4,162.5870
Total	1.8706	15.7694	17.2056	0.0428								4,129.5269	4,129.5269	1.3224		4,162.5870

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0651	1.9304	0.5581	7.8900e-003								849.4984	849.4984	0.0510		850.7735
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.1881	2.0048	1.5374	0.0112								1,174.7898	1,174.7898	0.0584		1,176.2497

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

3.12 Site Preparation - Demobilization - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	1.8706	15.7694	17.2056	0.0428							0.0000	4,129.5269	4,129.5269	1.3224		4,162.5870
Total	1.8706	15.7694	17.2056	0.0428							0.0000	4,129.5269	4,129.5269	1.3224		4,162.5870

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0651	1.9304	0.5581	7.8900e-003								849.4984	849.4984	0.0510		850.7735
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.1881	2.0048	1.5374	0.0112								1,174.7898	1,174.7898	0.0584		1,176.2497

4.0 Operational Detail - Mobile

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.4488	1.8590	6.3619	0.0230								2,323.4690	2,323.4690	0.0897		2,325.7107
Unmitigated	0.4488	1.8590	6.3619	0.0230								2,323.4690	2,323.4690	0.0897		2,325.7107

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
General Light Industry	255.03	48.30	24.88	744,182	744,182
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	255.03	48.30	24.88	744,182	744,182

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Other Asphalt Surfaces	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Other Non-Asphalt Surfaces	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866
NaturalGas Unmitigated	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	2102.19	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	2.10219	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866

6.0 Area Detail

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.9916	4.0000e-005	4.1300e-003	0.0000								8.8200e-003	8.8200e-003	2.0000e-005		9.4000e-003
Unmitigated	1.9916	4.0000e-005	4.1300e-003	0.0000								8.8200e-003	8.8200e-003	2.0000e-005		9.4000e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.1511												0.0000			0.0000
Consumer Products	0.8401												0.0000			0.0000
Landscaping	3.9000e-004	4.0000e-005	4.1300e-003	0.0000								8.8200e-003	8.8200e-003	2.0000e-005		9.4000e-003
Total	1.9916	4.0000e-005	4.1300e-003	0.0000								8.8200e-003	8.8200e-003	2.0000e-005		9.4000e-003

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.1511												0.0000			0.0000
Consumer Products	0.8401												0.0000			0.0000
Landscaping	3.9000e-004	4.0000e-005	4.1300e-003	0.0000								8.8200e-003	8.8200e-003	2.0000e-005		9.4000e-003
Total	1.9916	4.0000e-005	4.1300e-003	0.0000								8.8200e-003	8.8200e-003	2.0000e-005		9.4000e-003

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

Fire Pumps and Emergency Generators

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Summer

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

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

Equipment Type	Number
----------------	--------

11.0 Vegetation

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

Santa Felicia Dam Outlet Works Alt 2
Ventura County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	36.59	1000sqft	0.84	36,590.40	0
Other Asphalt Surfaces	0.56	Acre	0.56	24,393.60	0
Other Non-Asphalt Surfaces	3.14	Acre	3.14	136,778.40	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

Project Characteristics - Start of construction based on the schedule provided in the Constructability Analysis report.

Land Use - Acreage based on Constructability Analysis figures.

Construction Phase - Schedule based on Constructability Analysis, Table 3-1.

Off-road Equipment - Concrete Pump Truck, Water Truck, and Flatbed= Off-highway Truck.

Off-road Equipment - Construction equipment based on Constructability Analysis reports.

Off-road Equipment - Construction equipment based on Constructability Analysis reports.

Off-road Equipment - Construction equipment based on Constructability Analysis reports.

Off-road Equipment - Construction equipment based on Constructability Analysis reports.

Trips and VMT - Trip details based on Constructability Analysis report. Assumes worker and vendor trips are from the cities of Castaic and Santa Clarita, approximately 20 miles to the east.

Grading -

Area Coating -

Energy Use -

Construction Off-road Equipment Mitigation -

Off-road Equipment - 1

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	18295	90387
tblAreaCoating	Area_Nonresidential_Interior	54886	271161
tblAreaCoating	Area_Parking	9670	1045
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblLandUse	BuildingSpaceSquareFeet	36,590.00	36,590.40
tblLandUse	LandUseSquareFeet	36,590.00	36,590.40
tblOffRoadEquipment	HorsePower	124.00	46.00
tblOffRoadEquipment	LoadFactor	0.44	0.45
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Site Preparation - Mobilization
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Grading - Access Roads and Pad
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Grading - Access Roads and Pad
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Site Preparation - Mobilization
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Grading - Access Roads and Pad

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

tblOffRoadEquipment	PhaseName		Site Preparation - Mobilization
tblOffRoadEquipment	PhaseName		Grading - Access Roads and Pad
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Site Preparation - Mobilization
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Grading - Access Roads and Pad
tblOffRoadEquipment	PhaseName		Site Preparation - Mobilization
tblOffRoadEquipment	PhaseName		Grading - Access Roads and Pad
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	UsageHours	7.00	4.00
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tblOffRoadEquipment	UsageHours	8.00	4.00
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tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblProjectCharacteristics	OperationalYear	2018	2021
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripNumber	18.00	20.00
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tblTripsAndVMT	WorkerTripNumber	18.00	24.00
tblTripsAndVMT	WorkerTripNumber	25.00	24.00
tblTripsAndVMT	WorkerTripNumber	25.00	24.00
tblTripsAndVMT	WorkerTripNumber	23.00	24.00
tblTripsAndVMT	WorkerTripNumber	15.00	20.00
tblTripsAndVMT	WorkerTripNumber	83.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	12.00
tblTripsAndVMT	WorkerTripNumber	83.00	24.00
tblTripsAndVMT	WorkerTripNumber	3.00	8.00

2.0 Emissions Summary

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	8.8860	88.7110	67.4150	0.1580							0.0000	15,620.5251	15,620.5251	3.2480	0.0000	15,701.7251
2020	8.1924	80.7580	66.0767	0.1639							0.0000	16,186.7870	16,186.7870	3.5510	0.0000	16,275.5623
2021	7.0499	67.1245	54.4725	0.1634							0.0000	16,142.2221	16,142.2221	3.5268	0.0000	16,230.3923
2022	2.0839	17.8134	18.7253	0.0537							0.0000	5,279.6421	5,279.6421	1.3820	0.0000	5,314.1926
Maximum	8.8860	88.7110	67.4150	0.1639							0.0000	16,186.7870	16,186.7870	3.5510	0.0000	16,275.5623

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.9916	4.0000e-005	4.1300e-003	0.0000								8.8200e-003	8.8200e-003	2.0000e-005		9.4000e-003
Energy	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866
Mobile	0.4284	1.9576	6.3040	0.0220								2,227.9737	2,227.9737	0.0900		2,230.2239
Total	2.4427	2.1637	6.4813	0.0233								2,475.2994	2,475.2994	0.0948	4.5300e-003	2,479.0199

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.9916	4.0000e-005	4.1300e-003	0.0000								8.8200e-003	8.8200e-003	2.0000e-005		9.4000e-003
Energy	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866
Mobile	0.4284	1.9576	6.3040	0.0220								2,227.9737	2,227.9737	0.0900		2,230.2239
Total	2.4427	2.1637	6.4813	0.0233								2,475.2994	2,475.2994	0.0948	4.5300e-003	2,479.0199

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation - Mobilization	Site Preparation	8/1/2019	8/31/2019	5	22	
2	Grading - Access Roads and Pad	Grading	9/1/2019	2/29/2020	5	130	
3	Trenching - Intake Facility Excavation	Trenching	11/1/2019	4/30/2020	5	130	
4	Trenching - Tunnel Excavation	Trenching	11/1/2019	4/30/2020	5	130	
5	Trenching - Tunnel Pipe Install	Trenching	5/1/2020	8/31/2020	5	87	
6	Building Construction - Intake Tower and Ancillary Facilities	Building Construction	9/1/2020	9/30/2021	5	283	
7	Trenching - Downstream Facility Excavation	Trenching	11/1/2020	11/30/2020	5	21	
8	Building Construction - Downstream Facility Components	Building Construction	12/1/2020	7/31/2021	5	174	
9	Demolition - Remove Intake Facility Cofferdam	Demolition	10/1/2021	11/30/2021	5	43	
10	Demolition - Abandon Existing Outlet Works	Demolition	5/1/2022	6/30/2022	5	44	
11	Site Preparation - Demobilization	Site Preparation	7/1/2022	7/31/2022	5	21	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 3.7

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation - Mobilization	Air Compressors	0	6.00	78	0.48
Site Preparation - Mobilization	Excavators	1	4.00	158	0.38
Site Preparation - Mobilization	Generator Sets	1	4.00	84	0.74
Site Preparation - Mobilization	Graders	1	4.00	187	0.41
Site Preparation - Mobilization	Off-Highway Trucks	2	8.00	402	0.38
Site Preparation - Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation - Mobilization	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Site Preparation - Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading - Access Roads and Pad	Cranes	0	7.00	231	0.29
Grading - Access Roads and Pad	Dumpers/Tenders	1	8.00	16	0.38
Grading - Access Roads and Pad	Excavators	1	4.00	158	0.38
Grading - Access Roads and Pad	Forklifts	0	8.00	89	0.20
Grading - Access Roads and Pad	Generator Sets	1	8.00	84	0.74
Grading - Access Roads and Pad	Graders	1	8.00	187	0.41
Grading - Access Roads and Pad	Off-Highway Tractors	2	4.00	46	0.45
Grading - Access Roads and Pad	Off-Highway Trucks	1	8.00	402	0.38
Grading - Access Roads and Pad	Rubber Tired Dozers	0	8.00	247	0.40
Grading - Access Roads and Pad	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Trenching - Intake Facility Excavation	Aerial Lifts	1	8.00	63	0.31
Trenching - Intake Facility Excavation	Concrete/Industrial Saws	0	8.00	81	0.73
Trenching - Intake Facility Excavation	Cranes	1	4.00	231	0.29
Trenching - Intake Facility Excavation	Dumpers/Tenders	2	8.00	16	0.38
Trenching - Intake Facility Excavation	Excavators	1	8.00	158	0.38
Trenching - Intake Facility Excavation	Generator Sets	2	8.00	84	0.74
Trenching - Intake Facility Excavation	Off-Highway Trucks	1	8.00	402	0.38

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Trenching - Intake Facility Excavation	Rubber Tired Dozers	0	8.00	247	0.40
Trenching - Intake Facility Excavation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching - Tunnel Excavation	Aerial Lifts	1	4.00	63	0.31
Trenching - Tunnel Excavation	Bore/Drill Rigs	1	8.00	221	0.50
Trenching - Tunnel Excavation	Crawler Tractors	1	8.00	212	0.43
Trenching - Tunnel Excavation	Crushing/Proc. Equipment	1	8.00	85	0.78
Trenching - Tunnel Excavation	Dumpers/Tenders	1	8.00	16	0.38
Trenching - Tunnel Excavation	Excavators	1	8.00	158	0.38
Trenching - Tunnel Excavation	Generator Sets	1	8.00	84	0.74
Trenching - Tunnel Excavation	Graders	0	8.00	187	0.41
Trenching - Tunnel Excavation	Rubber Tired Dozers	0	8.00	247	0.40
Trenching - Tunnel Excavation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching - Tunnel Pipe Install	Cement and Mortar Mixers	0	6.00	9	0.56
Trenching - Tunnel Pipe Install	Crawler Tractors	1	4.00	212	0.43
Trenching - Tunnel Pipe Install	Generator Sets	1	8.00	84	0.74
Trenching - Tunnel Pipe Install	Off-Highway Trucks	1	6.00	402	0.38
Trenching - Tunnel Pipe Install	Pavers	0	8.00	130	0.42
Trenching - Tunnel Pipe Install	Paving Equipment	0	6.00	132	0.36
Trenching - Tunnel Pipe Install	Rollers	0	6.00	80	0.38
Trenching - Tunnel Pipe Install	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Trenching - Tunnel Pipe Install	Welders	2	8.00	46	0.45
Building Construction - Intake Tower and Ancillary Facilities	Aerial Lifts	1	4.00	63	0.31
Building Construction - Intake Tower and Ancillary Facilities	Air Compressors	1	8.00	78	0.48
Building Construction - Intake Tower and Ancillary Facilities	Cranes	1	4.00	231	0.29
Building Construction - Intake Tower and Ancillary Facilities	Forklifts	0	8.00	89	0.20
Building Construction - Intake Tower and Ancillary Facilities	Generator Sets	1	8.00	84	0.74

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Building Construction - Intake Tower and Ancillary Facilities	Off-Highway Tractors	1	8.00	124	0.44
Building Construction - Intake Tower and Ancillary Facilities	Off-Highway Trucks	3	8.00	402	0.38
Building Construction - Intake Tower and Ancillary Facilities	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Building Construction - Intake Tower and Ancillary Facilities	Welders	0	8.00	46	0.45
Trenching - Downstream Facility Excavation	Dumpers/Tenders	1	8.00	16	0.38
Trenching - Downstream Facility Excavation	Excavators	1	8.00	158	0.38
Trenching - Downstream Facility Excavation	Off-Highway Trucks	1	8.00	402	0.38
Trenching - Downstream Facility Excavation	Rubber Tired Dozers	0	8.00	247	0.40
Trenching - Downstream Facility Excavation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction - Downstream Facility Components	Air Compressors	1	8.00	78	0.48
Building Construction - Downstream Facility Components	Cranes	0	7.00	231	0.29
Building Construction - Downstream Facility Components	Cranes	1	4.00	231	0.29
Building Construction - Downstream Facility Components	Forklifts	0	8.00	89	0.20
Building Construction - Downstream Facility Components	Generator Sets	1	8.00	84	0.74
Building Construction - Downstream Facility Components	Off-Highway Tractors	1	8.00	124	0.44
Building Construction - Downstream Facility Components	Off-Highway Trucks	1	4.00	402	0.38
Building Construction - Downstream Facility Components	Off-Highway Trucks	2	8.00	402	0.38
Building Construction - Downstream Facility Components	Pavers	1	8.00	130	0.42
Building Construction - Downstream Facility Components	Rollers	1	8.00	80	0.38
Building Construction - Downstream Facility Components	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction - Downstream Facility Components	Welders	1	4.00	46	0.45
Demolition - Remove Intake Facility Cofferdam	Concrete/Industrial Saws	0	8.00	81	0.73

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Demolition - Remove Intake Facility Cofferdam	Excavators	1	8.00	158	0.38
Demolition - Remove Intake Facility Cofferdam	Rubber Tired Dozers	0	8.00	247	0.40
Demolition - Abandon Existing Outlet Works	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition - Abandon Existing Outlet Works	Dumpers/Tenders	1	8.00	16	0.38
Demolition - Abandon Existing Outlet Works	Excavators	0	8.00	158	0.38
Demolition - Abandon Existing Outlet Works	Off-Highway Trucks	1	4.00	402	0.38
Demolition - Abandon Existing Outlet Works	Off-Highway Trucks	2	8.00	402	0.38
Demolition - Abandon Existing Outlet Works	Rubber Tired Dozers	0	8.00	247	0.40
Demolition - Abandon Existing Outlet Works	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation - Demobilization	Dumpers/Tenders	1	8.00	16	0.38
Site Preparation - Demobilization	Excavators	1	8.00	158	0.38
Site Preparation - Demobilization	Off-Highway Trucks	2	8.00	402	0.38
Site Preparation - Demobilization	Pavers	1	8.00	130	0.42
Site Preparation - Demobilization	Rollers	1	8.00	80	0.38
Site Preparation - Demobilization	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation - Demobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation - Mobilization	7	20.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading - Access Roads and Pad	10	24.00	11.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Intake Facility Excavation	10	24.00	14.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Tunnel Excavation	9	24.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Tunnel Pipe Install	6	20.00	40.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction - Intake Tower and Ancill	9	24.00	38.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Downstream Facility Ex	3	12.00	2.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction - Downstream Facility C	11	24.00	18.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demolition - Remove Intake Facility Cofferdam	1	8.00	5.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demolition - Abandon Existing Outlet Works	5	20.00	19.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation - Demobilization	7	24.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.2 Site Preparation - Mobilization - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.3647	24.4049	15.8598	0.0403								3,972.6695	3,972.6695	1.1781		4,002.1216
Total	2.3647	24.4049	15.8598	0.0403								3,972.6695	3,972.6695	1.1781		4,002.1216

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0769	1.9849	0.5392	5.5600e-003								595.8412	595.8412	0.0402		596.8470
Worker	0.1465	0.0998	0.9916	2.8600e-003								284.9845	284.9845	7.9600e-003		285.1835
Total	0.2234	2.0847	1.5308	8.4200e-003								880.8256	880.8256	0.0482		882.0305

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.2 Site Preparation - Mobilization - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.3647	24.4049	15.8598	0.0403							0.0000	3,972.6695	3,972.6695	1.1781		4,002.1216
Total	2.3647	24.4049	15.8598	0.0403							0.0000	3,972.6695	3,972.6695	1.1781		4,002.1216

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0769	1.9849	0.5392	5.5600e-003								595.8412	595.8412	0.0402		596.8470
Worker	0.1465	0.0998	0.9916	2.8600e-003								284.9845	284.9845	7.9600e-003		285.1835
Total	0.2234	2.0847	1.5308	8.4200e-003								880.8256	880.8256	0.0482		882.0305

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.3 Grading - Access Roads and Pad - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.5430	26.3656	18.3484	0.0391								3,827.5219	3,827.5219	1.0406		3,853.5368
Total	2.5430	26.3656	18.3484	0.0391								3,827.5219	3,827.5219	1.0406		3,853.5368

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0940	2.4260	0.6590	6.7900e-003								728.2503	728.2503	0.0492		729.4797
Worker	0.1758	0.1197	1.1899	3.4300e-003								341.9814	341.9814	9.5500e-003		342.2202
Total	0.2698	2.5457	1.8489	0.0102								1,070.2317	1,070.2317	0.0587		1,071.6998

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.3 Grading - Access Roads and Pad - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.5430	26.3656	18.3484	0.0391							0.0000	3,827.5219	3,827.5219	1.0406		3,853.5368
Total	2.5430	26.3656	18.3484	0.0391							0.0000	3,827.5219	3,827.5219	1.0406		3,853.5368

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0940	2.4260	0.6590	6.7900e-003								728.2503	728.2503	0.0492		729.4797
Worker	0.1758	0.1197	1.1899	3.4300e-003								341.9814	341.9814	9.5500e-003		342.2202
Total	0.2698	2.5457	1.8489	0.0102								1,070.2317	1,070.2317	0.0587		1,071.6998

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.3 Grading - Access Roads and Pad - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.3625	24.1136	18.0539	0.0391								3,757.6803	3,757.6803	1.0357		3,783.5733
Total	2.3625	24.1136	18.0539	0.0391								3,757.6803	3,757.6803	1.0357		3,783.5733

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0758	2.1010	0.5849	6.7400e-003								723.0466	723.0466	0.0470		724.2215
Worker	0.1638	0.1070	1.0832	3.3200e-003								331.1617	331.1617	8.5100e-003		331.3745
Total	0.2396	2.2079	1.6680	0.0101								1,054.2083	1,054.2083	0.0555		1,055.5960

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.3 Grading - Access Roads and Pad - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.3625	24.1136	18.0539	0.0391							0.0000	3,757.6803	3,757.6803	1.0357		3,783.5733
Total	2.3625	24.1136	18.0539	0.0391							0.0000	3,757.6803	3,757.6803	1.0357		3,783.5733

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0758	2.1010	0.5849	6.7400e-003								723.0466	723.0466	0.0470		724.2215
Worker	0.1638	0.1070	1.0832	3.3200e-003								331.1617	331.1617	8.5100e-003		331.3745
Total	0.2396	2.2079	1.6680	0.0101								1,054.2083	1,054.2083	0.0555		1,055.5960

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.4 Trenching - Intake Facility Excavation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.7641	26.7173	22.0525	0.0438								4,253.7295	4,253.7295	1.0051		4,278.8557
Total	2.7641	26.7173	22.0525	0.0438								4,253.7295	4,253.7295	1.0051		4,278.8557

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1197	3.0876	0.8387	8.6500e-003								926.8641	926.8641	0.0626		928.4287
Worker	0.1758	0.1197	1.1899	3.4300e-003								341.9814	341.9814	9.5500e-003		342.2202
Total	0.2955	3.2074	2.0286	0.0121								1,268.8454	1,268.8454	0.0721		1,270.6488

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.4 Trenching - Intake Facility Excavation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.7641	26.7173	22.0525	0.0438							0.0000	4,253.7295	4,253.7295	1.0051		4,278.8557
Total	2.7641	26.7173	22.0525	0.0438							0.0000	4,253.7295	4,253.7295	1.0051		4,278.8557

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1197	3.0876	0.8387	8.6500e-003								926.8641	926.8641	0.0626		928.4287
Worker	0.1758	0.1197	1.1899	3.4300e-003								341.9814	341.9814	9.5500e-003		342.2202
Total	0.2955	3.2074	2.0286	0.0121								1,268.8454	1,268.8454	0.0721		1,270.6488

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.4 Trenching - Intake Facility Excavation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5384	24.1722	21.7020	0.0438								4,190.2419	4,190.2419	0.9960		4,215.1427
Total	2.5384	24.1722	21.7020	0.0438								4,190.2419	4,190.2419	0.9960		4,215.1427

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0965	2.6739	0.7444	8.5700e-003								920.2412	920.2412	0.0598		921.7364
Worker	0.1638	0.1070	1.0832	3.3200e-003								331.1617	331.1617	8.5100e-003		331.3745
Total	0.2603	2.7809	1.8275	0.0119								1,251.4028	1,251.4028	0.0683		1,253.1109

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.4 Trenching - Intake Facility Excavation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5384	24.1722	21.7020	0.0438							0.0000	4,190.2419	4,190.2419	0.9960		4,215.1427
Total	2.5384	24.1722	21.7020	0.0438							0.0000	4,190.2419	4,190.2419	0.9960		4,215.1427

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0965	2.6739	0.7444	8.5700e-003								920.2412	920.2412	0.0598		921.7364
Worker	0.1638	0.1070	1.0832	3.3200e-003								331.1617	331.1617	8.5100e-003		331.3745
Total	0.2603	2.7809	1.8275	0.0119								1,251.4028	1,251.4028	0.0683		1,253.1109

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.5 Trenching - Tunnel Excavation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.7609	27.7704	21.4076	0.0438								4,262.3740	4,262.3740	1.0217		4,287.9169
Total	2.7609	27.7704	21.4076	0.0438								4,262.3740	4,262.3740	1.0217		4,287.9169

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0769	1.9849	0.5392	5.5600e-003								595.8412	595.8412	0.0402		596.8470
Worker	0.1758	0.1197	1.1899	3.4300e-003								341.9814	341.9814	9.5500e-003		342.2202
Total	0.2527	2.1046	1.7291	8.9900e-003								937.8225	937.8225	0.0498		939.0672

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.5 Trenching - Tunnel Excavation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.7609	27.7704	21.4076	0.0438							0.0000	4,262.3740	4,262.3740	1.0217		4,287.9169
Total	2.7609	27.7704	21.4076	0.0438							0.0000	4,262.3740	4,262.3740	1.0217		4,287.9169

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0769	1.9849	0.5392	5.5600e-003								595.8412	595.8412	0.0402		596.8470
Worker	0.1758	0.1197	1.1899	3.4300e-003								341.9814	341.9814	9.5500e-003		342.2202
Total	0.2527	2.1046	1.7291	8.9900e-003								937.8225	937.8225	0.0498		939.0672

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.5 Trenching - Tunnel Excavation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5658	25.6574	21.2637	0.0438								4,201.6657	4,201.6657	1.0135		4,227.0033
Total	2.5658	25.6574	21.2637	0.0438								4,201.6657	4,201.6657	1.0135		4,227.0033

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0620	1.7190	0.4785	5.5100e-003								591.5836	591.5836	0.0385		592.5449
Worker	0.1638	0.1070	1.0832	3.3200e-003								331.1617	331.1617	8.5100e-003		331.3745
Total	0.2258	1.8259	1.5617	8.8300e-003								922.7453	922.7453	0.0470		923.9193

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.5 Trenching - Tunnel Excavation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5658	25.6574	21.2637	0.0438							0.0000	4,201.6657	4,201.6657	1.0135		4,227.0033
Total	2.5658	25.6574	21.2637	0.0438							0.0000	4,201.6657	4,201.6657	1.0135		4,227.0033

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0620	1.7190	0.4785	5.5100e-003								591.5836	591.5836	0.0385		592.5449
Worker	0.1638	0.1070	1.0832	3.3200e-003								331.1617	331.1617	8.5100e-003		331.3745
Total	0.2258	1.8259	1.5617	8.8300e-003								922.7453	922.7453	0.0470		923.9193

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.6 Trenching - Tunnel Pipe Install - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9747	16.1397	12.4870	0.0271								2,527.5350	2,527.5350	0.5782		2,541.9891
Total	1.9747	16.1397	12.4870	0.0271								2,527.5350	2,527.5350	0.5782		2,541.9891

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2757	7.6398	2.1267	0.0245								2,629.2604	2,629.2604	0.1709		2,633.5327
Worker	0.1365	0.0892	0.9026	2.7700e-003								275.9681	275.9681	7.0900e-003		276.1454
Total	0.4122	7.7290	3.0293	0.0273								2,905.2285	2,905.2285	0.1780		2,909.6781

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.6 Trenching - Tunnel Pipe Install - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9747	16.1397	12.4870	0.0271							0.0000	2,527.5350	2,527.5350	0.5782		2,541.9891
Total	1.9747	16.1397	12.4870	0.0271							0.0000	2,527.5350	2,527.5350	0.5782		2,541.9891

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2757	7.6398	2.1267	0.0245								2,629.2604	2,629.2604	0.1709		2,633.5327
Worker	0.1365	0.0892	0.9026	2.7700e-003								275.9681	275.9681	7.0900e-003		276.1454
Total	0.4122	7.7290	3.0293	0.0273								2,905.2285	2,905.2285	0.1780		2,909.6781

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.7 Building Construction - Intake Tower and Ancillary Facilities - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3233	31.5434	23.4162	0.0601								5,800.3291	5,800.3291	1.6172		5,840.7594
Total	3.3233	31.5434	23.4162	0.0601								5,800.3291	5,800.3291	1.6172		5,840.7594

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2619	7.2579	2.0204	0.0233								2,497.7974	2,497.7974	0.1623		2,501.8560
Worker	0.1638	0.1070	1.0832	3.3200e-003								331.1617	331.1617	8.5100e-003		331.3745
Total	0.4257	7.3648	3.1035	0.0266								2,828.9591	2,828.9591	0.1709		2,833.2305

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.7 Building Construction - Intake Tower and Ancillary Facilities - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3233	31.5434	23.4162	0.0601							0.0000	5,800.3291	5,800.3291	1.6172		5,840.7594
Total	3.3233	31.5434	23.4162	0.0601							0.0000	5,800.3291	5,800.3291	1.6172		5,840.7594

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2619	7.2579	2.0204	0.0233								2,497.7974	2,497.7974	0.1623		2,501.8560
Worker	0.1638	0.1070	1.0832	3.3200e-003								331.1617	331.1617	8.5100e-003		331.3745
Total	0.4257	7.3648	3.1035	0.0266								2,828.9591	2,828.9591	0.1709		2,833.2305

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.7 Building Construction - Intake Tower and Ancillary Facilities - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.0348	27.2242	22.6878	0.0601								5,800.0789	5,800.0789	1.6105		5,840.3424
Total	3.0348	27.2242	22.6878	0.0601								5,800.0789	5,800.0789	1.6105		5,840.3424

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2126	6.2384	1.8119	0.0231								2,481.4504	2,481.4504	0.1573		2,485.3817
Worker	0.1540	0.0965	1.0006	3.2200e-003								321.2114	321.2114	7.7600e-003		321.4054
Total	0.3666	6.3349	2.8125	0.0263								2,802.6619	2,802.6619	0.1650		2,806.7871

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.7 Building Construction - Intake Tower and Ancillary Facilities - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.0348	27.2242	22.6878	0.0601							0.0000	5,800.0789	5,800.0789	1.6105		5,840.3423
Total	3.0348	27.2242	22.6878	0.0601							0.0000	5,800.0789	5,800.0789	1.6105		5,840.3423

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2126	6.2384	1.8119	0.0231								2,481.4504	2,481.4504	0.1573		2,485.3817
Worker	0.1540	0.0965	1.0006	3.2200e-003								321.2114	321.2114	7.7600e-003		321.4054
Total	0.3666	6.3349	2.8125	0.0263								2,802.6619	2,802.6619	0.1650		2,806.7871

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.8 Trenching - Downstream Facility Excavation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9816	9.2003	7.3287	0.0191								1,839.6807	1,839.6807	0.5818		1,854.2263
Total	0.9816	9.2003	7.3287	0.0191								1,839.6807	1,839.6807	0.5818		1,854.2263

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0138	0.3820	0.1063	1.2200e-003								131.4630	131.4630	8.5400e-003		131.6766
Worker	0.0819	0.0535	0.5416	1.6600e-003								165.5808	165.5808	4.2600e-003		165.6873
Total	0.0957	0.4355	0.6479	2.8800e-003								297.0439	297.0439	0.0128		297.3639

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.8 Trenching - Downstream Facility Excavation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9816	9.2003	7.3287	0.0191							0.0000	1,839.6807	1,839.6807	0.5818		1,854.2263
Total	0.9816	9.2003	7.3287	0.0191							0.0000	1,839.6807	1,839.6807	0.5818		1,854.2263

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0138	0.3820	0.1063	1.2200e-003								131.4630	131.4630	8.5400e-003		131.6766
Worker	0.0819	0.0535	0.5416	1.6600e-003								165.5808	165.5808	4.2600e-003		165.6873
Total	0.0957	0.4355	0.6479	2.8800e-003								297.0439	297.0439	0.0128		297.3639

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.9 Building Construction - Downstream Facility Components - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7186	34.7898	27.7791	0.0629								6,043.1699	6,043.1699	1.6775		6,085.1082
Total	3.7186	34.7898	27.7791	0.0629								6,043.1699	6,043.1699	1.6775		6,085.1082

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1241	3.4379	0.9570	0.0110								1,183.1672	1,183.1672	0.0769		1,185.0897
Worker	0.1638	0.1070	1.0832	3.3200e-003								331.1617	331.1617	8.5100e-003		331.3745
Total	0.2879	3.5449	2.0402	0.0143								1,514.3289	1,514.3289	0.0854		1,516.4642

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.9 Building Construction - Downstream Facility Components - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.7186	34.7898	27.7791	0.0629							0.0000	6,043.1699	6,043.1699	1.6775		6,085.1082
Total	3.7186	34.7898	27.7791	0.0629							0.0000	6,043.1699	6,043.1699	1.6775		6,085.1082

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1241	3.4379	0.9570	0.0110								1,183.1672	1,183.1672	0.0769		1,185.0897
Worker	0.1638	0.1070	1.0832	3.3200e-003								331.1617	331.1617	8.5100e-003		331.3745
Total	0.2879	3.5449	2.0402	0.0143								1,514.3289	1,514.3289	0.0854		1,516.4642

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.9 Building Construction - Downstream Facility Components - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3938	30.5139	27.1134	0.0629								6,042.8461	6,042.8461	1.6690		6,084.5714
Total	3.3938	30.5139	27.1134	0.0629								6,042.8461	6,042.8461	1.6690		6,084.5714

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1007	2.9551	0.8583	0.0109								1,175.4239	1,175.4239	0.0745		1,177.2861
Worker	0.1540	0.0965	1.0006	3.2200e-003								321.2114	321.2114	7.7600e-003		321.4054
Total	0.2547	3.0515	1.8588	0.0142								1,496.6353	1,496.6353	0.0823		1,498.6915

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.9 Building Construction - Downstream Facility Components - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3938	30.5139	27.1134	0.0629							0.0000	6,042.8461	6,042.8461	1.6690		6,084.5714
Total	3.3938	30.5139	27.1134	0.0629							0.0000	6,042.8461	6,042.8461	1.6690		6,084.5714

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1007	2.9551	0.8583	0.0109								1,175.4239	1,175.4239	0.0745		1,177.2861
Worker	0.1540	0.0965	1.0006	3.2200e-003								321.2114	321.2114	7.7600e-003		321.4054
Total	0.2547	3.0515	1.8588	0.0142								1,496.6353	1,496.6353	0.0823		1,498.6915

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.10 Demolition - Remove Intake Facility Cofferdam - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2292	2.1534	3.2718	5.1700e-003								500.1920	500.1920	0.1618		504.2363
Total	0.2292	2.1534	3.2718	5.1700e-003								500.1920	500.1920	0.1618		504.2363

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0280	0.8209	0.2384	3.0400e-003								326.5066	326.5066	0.0207		327.0239
Worker	0.0514	0.0322	0.3335	1.0700e-003								107.0705	107.0705	2.5900e-003		107.1351
Total	0.0793	0.8530	0.5719	4.1100e-003								433.5771	433.5771	0.0233		434.1590

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.10 Demolition - Remove Intake Facility Cofferdam - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2292	2.1534	3.2718	5.1700e-003							0.0000	500.1920	500.1920	0.1618		504.2363
Total	0.2292	2.1534	3.2718	5.1700e-003							0.0000	500.1920	500.1920	0.1618		504.2363

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0280	0.8209	0.2384	3.0400e-003								326.5066	326.5066	0.0207		327.0239
Worker	0.0514	0.0322	0.3335	1.0700e-003								107.0705	107.0705	2.5900e-003		107.1351
Total	0.0793	0.8530	0.5719	4.1100e-003								433.5771	433.5771	0.0233		434.1590

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.11 Demolition - Abandon Existing Outlet Works - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5592	12.1745	10.8856	0.0369								3,559.6425	3,559.6425	1.1381		3,588.0948
Total	1.5592	12.1745	10.8856	0.0369								3,559.6425	3,559.6425	1.1381		3,588.0948

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0991	2.8601	0.8682	0.0114								1,228.7427	1,228.7427	0.0769		1,230.6650
Worker	0.1212	0.0726	0.7714	2.5900e-003								257.8304	257.8304	5.8400e-003		257.9764
Total	0.2204	2.9327	1.6396	0.0140								1,486.5731	1,486.5731	0.0827		1,488.6414

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.11 Demolition - Abandon Existing Outlet Works - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5592	12.1745	10.8856	0.0369							0.0000	3,559.6425	3,559.6425	1.1381		3,588.0948
Total	1.5592	12.1745	10.8856	0.0369							0.0000	3,559.6425	3,559.6425	1.1381		3,588.0948

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0991	2.8601	0.8682	0.0114								1,228.7427	1,228.7427	0.0769		1,230.6650
Worker	0.1212	0.0726	0.7714	2.5900e-003								257.8304	257.8304	5.8400e-003		257.9764
Total	0.2204	2.9327	1.6396	0.0140								1,486.5731	1,486.5731	0.0827		1,488.6414

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.12 Site Preparation - Demobilization - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	1.8706	15.7694	17.2056	0.0428								4,129.5269	4,129.5269	1.3224		4,162.5870
Total	1.8706	15.7694	17.2056	0.0428								4,129.5269	4,129.5269	1.3224		4,162.5870

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0678	1.9569	0.5940	7.8100e-003								840.7187	840.7187	0.0526		842.0339
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.2133	2.0441	1.5197	0.0109								1,150.1152	1,150.1152	0.0596		1,151.6056

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

3.12 Site Preparation - Demobilization - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	1.8706	15.7694	17.2056	0.0428							0.0000	4,129.5269	4,129.5269	1.3224		4,162.5870
Total	1.8706	15.7694	17.2056	0.0428							0.0000	4,129.5269	4,129.5269	1.3224		4,162.5870

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0678	1.9569	0.5940	7.8100e-003								840.7187	840.7187	0.0526		842.0339
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.2133	2.0441	1.5197	0.0109								1,150.1152	1,150.1152	0.0596		1,151.6056

4.0 Operational Detail - Mobile

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.4284	1.9576	6.3040	0.0220								2,227.9737	2,227.9737	0.0900		2,230.2239
Unmitigated	0.4284	1.9576	6.3040	0.0220								2,227.9737	2,227.9737	0.0900		2,230.2239

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
General Light Industry	255.03	48.30	24.88	744,182	744,182
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	255.03	48.30	24.88	744,182	744,182

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Other Asphalt Surfaces	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Other Non-Asphalt Surfaces	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866
NaturalGas Unmitigated	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	2102.19	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Light Industry	2.10219	0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0227	0.2061	0.1731	1.2400e-003								247.3169	247.3169	4.7400e-003	4.5300e-003	248.7866

6.0 Area Detail

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.9916	4.0000e-005	4.1300e-003	0.0000								8.8200e-003	8.8200e-003	2.0000e-005		9.4000e-003
Unmitigated	1.9916	4.0000e-005	4.1300e-003	0.0000								8.8200e-003	8.8200e-003	2.0000e-005		9.4000e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.1511												0.0000			0.0000
Consumer Products	0.8401												0.0000			0.0000
Landscaping	3.9000e-004	4.0000e-005	4.1300e-003	0.0000								8.8200e-003	8.8200e-003	2.0000e-005		9.4000e-003
Total	1.9916	4.0000e-005	4.1300e-003	0.0000								8.8200e-003	8.8200e-003	2.0000e-005		9.4000e-003

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.1511												0.0000			0.0000
Consumer Products	0.8401												0.0000			0.0000
Landscaping	3.9000e-004	4.0000e-005	4.1300e-003	0.0000								8.8200e-003	8.8200e-003	2.0000e-005		9.4000e-003
Total	1.9916	4.0000e-005	4.1300e-003	0.0000								8.8200e-003	8.8200e-003	2.0000e-005		9.4000e-003

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

Fire Pumps and Emergency Generators

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Winter

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

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

User Defined Equipment

Equipment Type	Number
----------------	--------

11.0 Vegetation

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

Santa Felicia Dam Spillway Imp Alt 1A

Ventura County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	0.23	Acre	0.23	10,018.80	0
User Defined Recreational	3.31	User Defined Unit	3.31	144,183.60	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

Project Characteristics - Start of construction based on the schedule provided in the Constructability Analysis report.

Land Use - Acreage based on Constructability Analysis figures.

Construction Phase - Schedule based on Constructability Analysis, Table 3-1.

Off-road Equipment - Concrete Pump Truck, Water Truck, and Flatbed= Off-highway Truck.

Off-road Equipment - Flatbed, concrete pump truck, and water truck = Off-highway truck

Off-road Equipment - Water Truck= Off-highway truck, Compactor - off-highway tractor.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Water truck= off-highway truck

Off-road Equipment - Equipment info based on Constructability Analysis, Table 2. Chipper = generator set. Water truck, flatbed truck = off-highway truck.

Off-road Equipment - Construction equipment info based on Constructability Analysis report. Sheepsfoot compactor = off-highway tractor. Plate compactor = Walking and Whacker Compactors.

Off-road Equipment - flatbed and water truck = off-highway truck.

Off-road Equipment - Water truck and concrete pump truck = off-highway truck

Trips and VMT - Trip and VMT details based on Constructability Analysis report.

Grading -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Area Coating -

Energy Use -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblGrading	AcresOfGrading	5.25	0.00
tblLandUse	BuildingSpaceSquareFeet	0.00	144,183.60
tblLandUse	LandUseSquareFeet	0.00	144,183.60

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

tblLandUse	LotAcreage	0.00	3.31
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00

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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Excavation for Chute Widening
tblOffRoadEquipment	PhaseName		Mobilization
tblOffRoadEquipment	PhaseName		Access Road Realignment

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tblOffRoadEquipment	PhaseName	Selective Site Demolition
tblOffRoadEquipment	PhaseName	Excavation for Chute Widening
tblOffRoadEquipment	PhaseName	Mobilization
tblOffRoadEquipment	PhaseName	Access Road Realignment
tblOffRoadEquipment	PhaseName	Selective Site Demolition
tblOffRoadEquipment	PhaseName	Excavation for Chute Widening
tblOffRoadEquipment	PhaseName	Demobilization/Reclamation
tblOffRoadEquipment	PhaseName	Mobilization
tblOffRoadEquipment	PhaseName	Access Road Realignment
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tblOffRoadEquipment	PhaseName	Excavation for Chute Widening
tblOffRoadEquipment	PhaseName	Access Bridge
tblOffRoadEquipment	PhaseName	Mobilization
tblOffRoadEquipment	PhaseName	Access Road Realignment
tblOffRoadEquipment	PhaseName	Mobilization
tblOffRoadEquipment	PhaseName	Access Road Realignment
tblOffRoadEquipment	PhaseName	Access Road Realignment
tblOffRoadEquipment	PhaseName	MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName	Mobilization
tblOffRoadEquipment	PhaseName	Access Road Realignment
tblOffRoadEquipment	PhaseName	Selective Site Demolition
tblOffRoadEquipment	PhaseName	Excavation for Chute Widening
tblOffRoadEquipment	PhaseName	Training Walls and Chute Lining
tblOffRoadEquipment	PhaseName	Training Walls and Chute Lining
tblOffRoadEquipment	PhaseName	MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName	Bridge Pier and Abutment
tblOffRoadEquipment	PhaseName	Bridge Pier and Abutment

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tblOffRoadEquipment	PhaseName		Access Bridge
tblOffRoadEquipment	PhaseName		Access Bridge
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		Bridge Pier and Abutment
tblOffRoadEquipment	PhaseName		Access Bridge
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		Bridge Pier and Abutment
tblOffRoadEquipment	PhaseName		Access Bridge
tblOffRoadEquipment	PhaseName		Selective Site Demolition
tblOffRoadEquipment	PhaseName		Excavation for Chute Widening
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
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tblOffRoadEquipment	UsageHours	7.00	8.00
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tblProjectCharacteristics	OperationalYear	2018	2023
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00

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tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
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tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	0.00	17.00
tblTripsAndVMT	VendorTripNumber	0.00	13.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	25.00	15.00
tblTripsAndVMT	VendorTripNumber	25.00	13.00
tblTripsAndVMT	VendorTripNumber	25.00	15.00
tblTripsAndVMT	VendorTripNumber	25.00	12.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
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tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripNumber	23.00	20.00
tblTripsAndVMT	WorkerTripNumber	25.00	24.00
tblTripsAndVMT	WorkerTripNumber	23.00	28.00

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tblTripsAndVMT	WorkerTripNumber	30.00	28.00
tblTripsAndVMT	WorkerTripNumber	65.00	24.00
tblTripsAndVMT	WorkerTripNumber	65.00	28.00
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tblTripsAndVMT	WorkerTripNumber	65.00	20.00
tblTripsAndVMT	WorkerTripNumber	10.00	20.00
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tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00

2.0 Emissions Summary

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.3947	24.5718	20.1725	0.0538							0.0000	5,309.0796	5,309.0796	1.3170	0.0000	5,339.6631
2022	4.5703	39.5242	41.7960	0.1103							0.0000	10,773.8038	10,773.8038	2.7986	0.0000	10,843.7684
2023	3.6893	31.6098	28.8622	0.1015							0.0000	10,039.3970	10,039.3970	2.5645	0.0000	10,103.5098
Maximum	4.5703	39.5242	41.7960	0.1103							0.0000	10,773.8038	10,773.8038	2.7986	0.0000	10,843.7684

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.3947	24.5718	20.1725	0.0538							0.0000	5,309.0796	5,309.0796	1.3170	0.0000	5,339.6631
2022	4.5703	39.5242	41.7960	0.1103							0.0000	10,773.8038	10,773.8038	2.7986	0.0000	10,843.7684
2023	3.6893	31.6098	28.8622	0.1015							0.0000	10,039.3970	10,039.3970	2.5645	0.0000	10,103.5098
Maximum	4.5703	39.5242	41.7960	0.1103							0.0000	10,773.8038	10,773.8038	2.7986	0.0000	10,843.7684

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.0065	0.0000	3.6000e-004	0.0000								7.7000e-004	7.7000e-004	0.0000		8.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Total	4.0065	0.0000	3.6000e-004	0.0000								7.7000e-004	7.7000e-004	0.0000	0.0000	8.3000e-004

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.0065	0.0000	3.6000e-004	0.0000								7.7000e-004	7.7000e-004	0.0000		8.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Total	4.0065	0.0000	3.6000e-004	0.0000								7.7000e-004	7.7000e-004	0.0000	0.0000	8.3000e-004

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Site Preparation	10/1/2021	10/31/2021	5	21	
2	Access Road Realignment	Paving	11/1/2021	1/31/2022	5	66	
3	Selective Site Demolition	Demolition	2/1/2022	5/31/2022	5	86	
4	Excavation for Chute Widening	Trenching	3/1/2022	8/31/2022	5	132	
5	Training Walls and Chute Lining	Building Construction	9/1/2022	4/30/2023	5	172	
6	MSE Wall Dam Raise	Building Construction	9/1/2022	12/31/2022	5	87	
7	Bridge Pier and Abutment	Building Construction	1/2/2023	4/30/2023	5	85	
8	Access Bridge	Building Construction	5/1/2023	8/31/2023	5	89	
9	Demobilization/Reclamation	Site Preparation	9/1/2023	9/30/2023	5	21	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.23

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Concrete/Industrial Saws	0	8.00	81	0.73

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Mobilization	Dumpers/Tenders	1	4.00	16	0.38
Mobilization	Excavators	1	4.00	158	0.38
Mobilization	Generator Sets	1	4.00	84	0.74
Mobilization	Graders	1	4.00	187	0.41
Mobilization	Off-Highway Trucks	2	8.00	402	0.38
Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Mobilization	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Mobilization	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Access Road Realignment	Cement and Mortar Mixers	0	6.00	9	0.56
Access Road Realignment	Concrete/Industrial Saws	0		81	0.73
Access Road Realignment	Dumpers/Tenders	1	8.00	16	0.38
Access Road Realignment	Excavators	1	8.00	158	0.38
Access Road Realignment	Generator Sets	1	4.00	84	0.74
Access Road Realignment	Graders	1	8.00	187	0.41
Access Road Realignment	Off-Highway Tractors	2	4.00	124	0.44
Access Road Realignment	Off-Highway Trucks	1	8.00	402	0.38
Access Road Realignment	Pavers	0	8.00	130	0.42
Access Road Realignment	Paving Equipment	0	6.00	132	0.36
Access Road Realignment	Rollers	0	6.00	80	0.38
Access Road Realignment	Tractors/Loaders/Backhoes	2	4.00	97	0.37
Access Road Realignment	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Selective Site Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Selective Site Demolition	Cranes	1	8.00	231	0.29
Selective Site Demolition	Dumpers/Tenders	2	8.00	16	0.38
Selective Site Demolition	Excavators	2	8.00	158	0.38
Selective Site Demolition	Off-Highway Trucks	2	8.00	402	0.38
Selective Site Demolition	Rubber Tired Dozers	0	8.00	247	0.40

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Selective Site Demolition	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Excavation for Chute Widening	Aerial Lifts	1	4.00	63	0.31
Excavation for Chute Widening	Cranes	1	4.00	231	0.29
Excavation for Chute Widening	Dumpers/Tenders	4	8.00	16	0.38
Excavation for Chute Widening	Excavators	1	4.00	158	0.38
Excavation for Chute Widening	Excavators	2	8.00	158	0.38
Excavation for Chute Widening	Off-Highway Trucks	1	8.00	402	0.38
Excavation for Chute Widening	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Training Walls and Chute Lining	Cranes	1	8.00	231	0.29
Training Walls and Chute Lining	Forklifts	0	8.00	89	0.20
Training Walls and Chute Lining	Generator Sets	0	8.00	84	0.74
Training Walls and Chute Lining	Off-Highway Trucks	1	4.00	402	0.38
Training Walls and Chute Lining	Off-Highway Trucks	1	8.00	402	0.38
Training Walls and Chute Lining	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Training Walls and Chute Lining	Welders	0	8.00	46	0.45
MSE Wall Dam Raise	Cranes	0	7.00	231	0.29
MSE Wall Dam Raise	Forklifts	0	8.00	89	0.20
MSE Wall Dam Raise	Generator Sets	0	8.00	84	0.74
MSE Wall Dam Raise	Off-Highway Tractors	1	8.00	124	0.44
MSE Wall Dam Raise	Off-Highway Trucks	1	8.00	402	0.38
MSE Wall Dam Raise	Pavers	1	8.00	130	0.42
MSE Wall Dam Raise	Plate Compactors	4	8.00	8	0.43
MSE Wall Dam Raise	Rollers	2	8.00	80	0.38
MSE Wall Dam Raise	Tractors/Loaders/Backhoes	2	8.00	97	0.37
MSE Wall Dam Raise	Welders	0	8.00	46	0.45
Bridge Pier and Abutment	Cranes	1	8.00	231	0.29
Bridge Pier and Abutment	Forklifts	0	8.00	89	0.20

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Bridge Pier and Abutment	Generator Sets	0	8.00	84	0.74
Bridge Pier and Abutment	Off-Highway Trucks	1	4.00	402	0.38
Bridge Pier and Abutment	Off-Highway Trucks	2	8.00	402	0.38
Bridge Pier and Abutment	Pavers	1	8.00	130	0.42
Bridge Pier and Abutment	Rollers	1	8.00	80	0.38
Bridge Pier and Abutment	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Bridge Pier and Abutment	Welders	0	8.00	46	0.45
Access Bridge	Cranes	1	8.00	231	0.29
Access Bridge	Excavators	1	8.00	158	0.38
Access Bridge	Forklifts	0	8.00	89	0.20
Access Bridge	Generator Sets	0	8.00	84	0.74
Access Bridge	Off-Highway Trucks	1	4.00	402	0.38
Access Bridge	Off-Highway Trucks	2	8.00	402	0.38
Access Bridge	Pavers	1	8.00	130	0.42
Access Bridge	Rollers	1	8.00	80	0.38
Access Bridge	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Access Bridge	Welders	0	8.00	46	0.45
Demobilization/Reclamation	Dumpers/Tenders	1	8.00	16	0.38
Demobilization/Reclamation	Off-Highway Trucks	2	8.00	402	0.38
Demobilization/Reclamation	Rubber Tired Dozers	0	8.00	247	0.40
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	2	8.00	97	0.37

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Demobilization/Reclamation	Generator Sets	2	8.00	84	0.74
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Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	9	20.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Access Road Realignment	10	24.00	17.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Selective Site Demolition	9	28.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Excavation for Chute Widening	12	28.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Training Walls and Chute Lining	4	24.00	15.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
MSE Wall Dam Raise	11	28.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Bridge Pier and Abutment	7	20.00	15.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Access Bridge	8	20.00	12.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	20.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

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3.2 Mobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.2365	21.1206	17.3466	0.0437								4,222.2217	4,222.2217	1.2741		4,254.0745
Total	2.2365	21.1206	17.3466	0.0437								4,222.2217	4,222.2217	1.2741		4,254.0745

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0483	1.4557	0.4029	5.5200e-003								593.7979	593.7979	0.0361		594.6995
Worker	0.1088	0.0686	0.8804	2.8200e-003								281.4355	281.4355	6.8000e-003		281.6056
Total	0.1571	1.5242	1.2832	8.3400e-003								875.2334	875.2334	0.0429		876.3050

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.2 Mobilization - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.2365	21.1206	17.3466	0.0437							0.0000	4,222.2217	4,222.2217	1.2741		4,254.0745
Total	2.2365	21.1206	17.3466	0.0437							0.0000	4,222.2217	4,222.2217	1.2741		4,254.0745

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0483	1.4557	0.4029	5.5200e-003								593.7979	593.7979	0.0361		594.6995
Worker	0.1088	0.0686	0.8804	2.8200e-003								281.4355	281.4355	6.8000e-003		281.6056
Total	0.1571	1.5242	1.2832	8.3400e-003								875.2334	875.2334	0.0429		876.3050

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.3 Access Road Realignment - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1637	21.7400	18.3551	0.0400								3,849.7387	3,849.7387	1.1471		3,878.4153
Paving	9.1300e-003												0.0000			0.0000
Total	2.1729	21.7400	18.3551	0.0400								3,849.7387	3,849.7387	1.1471		3,878.4153

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0913	2.7496	0.7610	0.0104								1,121.6183	1,121.6183	0.0681		1,123.3212
Worker	0.1305	0.0823	1.0564	3.3900e-003								337.7226	337.7226	8.1600e-003		337.9267
Total	0.2219	2.8319	1.8174	0.0138								1,459.3409	1,459.3409	0.0763		1,461.2479

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.3 Access Road Realignment - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1637	21.7400	18.3551	0.0400							0.0000	3,849.7387	3,849.7387	1.1471		3,878.4153
Paving	9.1300e-003												0.0000			0.0000
Total	2.1729	21.7400	18.3551	0.0400							0.0000	3,849.7387	3,849.7387	1.1471		3,878.4153

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0913	2.7496	0.7610	0.0104								1,121.6183	1,121.6183	0.0681		1,123.3212
Worker	0.1305	0.0823	1.0564	3.3900e-003								337.7226	337.7226	8.1600e-003		337.9267
Total	0.2219	2.8319	1.8174	0.0138								1,459.3409	1,459.3409	0.0763		1,461.2479

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.3 Access Road Realignment - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9362	18.4825	17.9660	0.0400								3,850.1887	3,850.1887	1.1461		3,878.8415
Paving	9.1300e-003												0.0000			0.0000
Total	1.9453	18.4825	17.9660	0.0400								3,850.1887	3,850.1887	1.1461		3,878.8415

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0851	2.5244	0.7298	0.0103								1,110.8825	1,110.8825	0.0667		1,112.5500
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.2081	2.5988	1.7091	0.0136								1,436.1739	1,436.1739	0.0741		1,438.0262

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.3 Access Road Realignment - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9362	18.4825	17.9660	0.0400							0.0000	3,850.1887	3,850.1887	1.1461		3,878.8415
Paving	9.1300e-003												0.0000			0.0000
Total	1.9453	18.4825	17.9660	0.0400							0.0000	3,850.1887	3,850.1887	1.1461		3,878.8415

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0851	2.5244	0.7298	0.0103								1,110.8825	1,110.8825	0.0667		1,112.5500
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.2081	2.5988	1.7091	0.0136								1,436.1739	1,436.1739	0.0741		1,438.0262

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.4 Selective Site Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3110	20.0460	20.0976	0.0503								4,841.1900	4,841.1900	1.5394		4,879.6751
Total	2.3110	20.0460	20.0976	0.0503								4,841.1900	4,841.1900	1.5394		4,879.6751

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0651	1.9304	0.5581	7.8900e-003								849.4984	849.4984	0.0510		850.7735
Worker	0.1435	0.0868	1.1425	3.8100e-003								379.5067	379.5067	8.6200e-003		379.7222
Total	0.2086	2.0172	1.7006	0.0117								1,229.0051	1,229.0051	0.0596		1,230.4957

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.4 Selective Site Demolition - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3110	20.0460	20.0976	0.0503							0.0000	4,841.1900	4,841.1900	1.5394		4,879.6751
Total	2.3110	20.0460	20.0976	0.0503							0.0000	4,841.1900	4,841.1900	1.5394		4,879.6751

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0651	1.9304	0.5581	7.8900e-003								849.4984	849.4984	0.0510		850.7735
Worker	0.1435	0.0868	1.1425	3.8100e-003								379.5067	379.5067	8.6200e-003		379.7222
Total	0.2086	2.0172	1.7006	0.0117								1,229.0051	1,229.0051	0.0596		1,230.4957

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.5 Excavation for Chute Widening - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8622	16.0378	18.4689	0.0391								3,735.9877	3,735.9877	1.1556		3,764.8783
Total	1.8622	16.0378	18.4689	0.0391								3,735.9877	3,735.9877	1.1556		3,764.8783

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0451	1.3364	0.3864	5.4600e-003								588.1142	588.1142	0.0353		588.9971
Worker	0.1435	0.0868	1.1425	3.8100e-003								379.5067	379.5067	8.6200e-003		379.7222
Total	0.1886	1.4232	1.5289	9.2700e-003								967.6210	967.6210	0.0439		968.7193

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.5 Excavation for Chute Widening - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8622	16.0378	18.4689	0.0391							0.0000	3,735.9877	3,735.9877	1.1556		3,764.8783
Total	1.8622	16.0378	18.4689	0.0391							0.0000	3,735.9877	3,735.9877	1.1556		3,764.8783

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0451	1.3364	0.3864	5.4600e-003								588.1142	588.1142	0.0353		588.9971
Worker	0.1435	0.0868	1.1425	3.8100e-003								379.5067	379.5067	8.6200e-003		379.7222
Total	0.1886	1.4232	1.5289	9.2700e-003								967.6210	967.6210	0.0439		968.7193

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.6 Training Walls and Chute Lining - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3303	11.8805	9.1684	0.0287								2,778.5472	2,778.5472	0.8986		2,801.0132
Total	1.3303	11.8805	9.1684	0.0287								2,778.5472	2,778.5472	0.8986		2,801.0132

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0751	2.2274	0.6439	9.1000e-003								980.1904	980.1904	0.0589		981.6618
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.1981	2.3018	1.6232	0.0124								1,305.4819	1,305.4819	0.0662		1,307.1380

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.6 Training Walls and Chute Lining - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3303	11.8805	9.1684	0.0287							0.0000	2,778.5472	2,778.5472	0.8986		2,801.0132
Total	1.3303	11.8805	9.1684	0.0287							0.0000	2,778.5472	2,778.5472	0.8986		2,801.0132

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0751	2.2274	0.6439	9.1000e-003								980.1904	980.1904	0.0589		981.6618
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.1981	2.3018	1.6232	0.0124								1,305.4819	1,305.4819	0.0662		1,307.1380

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.6 Training Walls and Chute Lining - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2586	10.7031	8.9985	0.0287								2,780.2285	2,780.2285	0.8992		2,802.7080
Total	1.2586	10.7031	8.9985	0.0287								2,780.2285	2,780.2285	0.8992		2,802.7080

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0550	1.5098	0.5900	8.8800e-003								958.1167	958.1167	0.0553		959.4988
Worker	0.1160	0.0673	0.9062	3.1400e-003								312.8145	312.8145	6.6700e-003		312.9812
Total	0.1710	1.5771	1.4962	0.0120								1,270.9311	1,270.9311	0.0620		1,272.4800

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.6 Training Walls and Chute Lining - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2586	10.7031	8.9985	0.0287							0.0000	2,780.2285	2,780.2285	0.8992		2,802.7080
Total	1.2586	10.7031	8.9985	0.0287							0.0000	2,780.2285	2,780.2285	0.8992		2,802.7080

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0550	1.5098	0.5900	8.8800e-003								958.1167	958.1167	0.0553		959.4988
Worker	0.1160	0.0673	0.9062	3.1400e-003								312.8145	312.8145	6.6700e-003		312.9812
Total	0.1710	1.5771	1.4962	0.0120								1,270.9311	1,270.9311	0.0620		1,272.4800

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.7 MSE Wall Dam Raise - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7802	16.0752	18.3468	0.0360								3,437.8200	3,437.8200	1.0816		3,464.8594
Total	1.7802	16.0752	18.3468	0.0360								3,437.8200	3,437.8200	1.0816		3,464.8594

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0651	1.9304	0.5581	7.8900e-003								849.4984	849.4984	0.0510		850.7735
Worker	0.1435	0.0868	1.1425	3.8100e-003								379.5067	379.5067	8.6200e-003		379.7222
Total	0.2086	2.0172	1.7006	0.0117								1,229.0051	1,229.0051	0.0596		1,230.4957

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.7 MSE Wall Dam Raise - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7802	16.0752	18.3468	0.0360							0.0000	3,437.8200	3,437.8200	1.0816		3,464.8594
Total	1.7802	16.0752	18.3468	0.0360							0.0000	3,437.8200	3,437.8200	1.0816		3,464.8594

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0651	1.9304	0.5581	7.8900e-003								849.4984	849.4984	0.0510		850.7735
Worker	0.1435	0.0868	1.1425	3.8100e-003								379.5067	379.5067	8.6200e-003		379.7222
Total	0.2086	2.0172	1.7006	0.0117								1,229.0051	1,229.0051	0.0596		1,230.4957

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.8 Bridge Pier and Abutment - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1081	17.7639	17.0224	0.0493								4,769.4420	4,769.4420	1.5425		4,808.0054
Total	2.1081	17.7639	17.0224	0.0493								4,769.4420	4,769.4420	1.5425		4,808.0054

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0550	1.5098	0.5900	8.8800e-003								958.1167	958.1167	0.0553		959.4988
Worker	0.0966	0.0560	0.7551	2.6100e-003								260.6787	260.6787	5.5600e-003		260.8176
Total	0.1516	1.5659	1.3452	0.0115								1,218.7954	1,218.7954	0.0609		1,220.3165

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.8 Bridge Pier and Abutment - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1081	17.7639	17.0224	0.0493							0.0000	4,769.4420	4,769.4420	1.5425		4,808.0054
Total	2.1081	17.7639	17.0224	0.0493							0.0000	4,769.4420	4,769.4420	1.5425		4,808.0054

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0550	1.5098	0.5900	8.8800e-003								958.1167	958.1167	0.0553		959.4988
Worker	0.0966	0.0560	0.7551	2.6100e-003								260.6787	260.6787	5.5600e-003		260.8176
Total	0.1516	1.5659	1.3452	0.0115								1,218.7954	1,218.7954	0.0609		1,220.3165

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.9 Access Bridge - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2968	19.3125	20.2801	0.0544								5,269.5476	5,269.5476	1.7043		5,312.1546
Total	2.2968	19.3125	20.2801	0.0544								5,269.5476	5,269.5476	1.7043		5,312.1546

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0440	1.2079	0.4720	7.1100e-003								766.4933	766.4933	0.0442		767.5991
Worker	0.0966	0.0560	0.7551	2.6100e-003								260.6787	260.6787	5.5600e-003		260.8176
Total	0.1406	1.2639	1.2272	9.7200e-003								1,027.1721	1,027.1721	0.0498		1,028.4167

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.9 Access Bridge - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2968	19.3125	20.2801	0.0544							0.0000	5,269.5476	5,269.5476	1.7043		5,312.1546
Total	2.2968	19.3125	20.2801	0.0544							0.0000	5,269.5476	5,269.5476	1.7043		5,312.1546

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0440	1.2079	0.4720	7.1100e-003								766.4933	766.4933	0.0442		767.5991
Worker	0.0966	0.0560	0.7551	2.6100e-003								260.6787	260.6787	5.5600e-003		260.8176
Total	0.1406	1.2639	1.2272	9.7200e-003								1,027.1721	1,027.1721	0.0498		1,028.4167

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.10 Demobilization/Reclamation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	1.9957	16.1028	18.6292	0.0466								4,469.9395	4,469.9395	1.0843		4,497.0473
Total	1.9957	16.1028	18.6292	0.0466								4,469.9395	4,469.9395	1.0843		4,497.0473

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0330	0.9059	0.3540	5.3300e-003								574.8700	574.8700	0.0332		575.6993
Worker	0.0966	0.0560	0.7551	2.6100e-003								260.6787	260.6787	5.5600e-003		260.8176
Total	0.1296	0.9619	1.1092	7.9400e-003								835.5487	835.5487	0.0387		836.5169

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

3.10 Demobilization/Reclamation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	1.9957	16.1028	18.6292	0.0466							0.0000	4,469.9394	4,469.9394	1.0843		4,497.0473
Total	1.9957	16.1028	18.6292	0.0466							0.0000	4,469.9394	4,469.9394	1.0843		4,497.0473

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0330	0.9059	0.3540	5.3300e-003								574.8700	574.8700	0.0332		575.6993
Worker	0.0966	0.0560	0.7551	2.6100e-003								260.6787	260.6787	5.5600e-003		260.8176
Total	0.1296	0.9619	1.1092	7.9400e-003								835.5487	835.5487	0.0387		836.5169

4.0 Operational Detail - Mobile

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Mitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000			0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000			0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
User Defined Recreational	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0
User Defined Recreational	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.593330	0.040945	0.188012	0.107577	0.017981	0.006204	0.019981	0.018142	0.001176	0.001026	0.003857	0.000384	0.001386
User Defined Recreational	0.593330	0.040945	0.188012	0.107577	0.017981	0.006204	0.019981	0.018142	0.001176	0.001026	0.003857	0.000384	0.001386

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.0065	0.0000	3.6000e-004	0.0000								7.7000e-004	7.7000e-004	0.0000		8.3000e-004
Unmitigated	4.0065	0.0000	3.6000e-004	0.0000								7.7000e-004	7.7000e-004	0.0000		8.3000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.9174												0.0000			0.0000
Consumer Products	3.0891												0.0000			0.0000
Landscaping	3.0000e-005	0.0000	3.6000e-004	0.0000								7.7000e-004	7.7000e-004	0.0000		8.3000e-004
Total	4.0065	0.0000	3.6000e-004	0.0000								7.7000e-004	7.7000e-004	0.0000		8.3000e-004

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.9174												0.0000			0.0000
Consumer Products	3.0891												0.0000			0.0000
Landscaping	3.0000e-005	0.0000	3.6000e-004	0.0000								7.7000e-004	7.7000e-004	0.0000		8.3000e-004
Total	4.0065	0.0000	3.6000e-004	0.0000								7.7000e-004	7.7000e-004	0.0000		8.3000e-004

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

Fire Pumps and Emergency Generators

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Summer

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

Boilers

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

User Defined Equipment

Equipment Type	Number
----------------	--------

11.0 Vegetation

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

Santa Felicia Dam Spillway Imp Alt 1A
Ventura County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	0.23	Acre	0.23	10,018.80	0
User Defined Recreational	3.31	User Defined Unit	3.31	144,183.60	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

Project Characteristics - Start of construction based on the schedule provided in the Constructability Analysis report.

Land Use - Acreage based on Constructability Analysis figures.

Construction Phase - Schedule based on Constructability Analysis, Table 3-1.

Off-road Equipment - Concrete Pump Truck, Water Truck, and Flatbed= Off-highway Truck.

Off-road Equipment - Flatbed, concrete pump truck, and water truck = Off-highway truck

Off-road Equipment - Water Truck= Off-highway truck, Compactor - off-highway tractor.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Water truck= off-highway truck

Off-road Equipment - Equipment info based on Constructability Analysis, Table 2. Chipper = generator set. Water truck, flatbed truck = off-highway truck.

Off-road Equipment - Construction equipment info based on Constructability Analysis report. Sheepsfoot compactor = off-highway tractor. Plate compactor = Walking and Whacker Compactors.

Off-road Equipment - flatbed and water truck = off-highway truck.

Off-road Equipment - Water truck and concrete pump truck = off-highway truck

Trips and VMT - Trip and VMT details based on Constructability Analysis report.

Grading -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Area Coating -

Energy Use -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblGrading	AcresOfGrading	5.25	0.00
tblLandUse	BuildingSpaceSquareFeet	0.00	144,183.60
tblLandUse	LandUseSquareFeet	0.00	144,183.60

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

tblLandUse	LotAcreage	0.00	3.31
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Excavation for Chute Widening
tblOffRoadEquipment	PhaseName		Mobilization
tblOffRoadEquipment	PhaseName		Access Road Realignment

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

tblOffRoadEquipment	PhaseName	Selective Site Demolition
tblOffRoadEquipment	PhaseName	Excavation for Chute Widening
tblOffRoadEquipment	PhaseName	Mobilization
tblOffRoadEquipment	PhaseName	Access Road Realignment
tblOffRoadEquipment	PhaseName	Selective Site Demolition
tblOffRoadEquipment	PhaseName	Excavation for Chute Widening
tblOffRoadEquipment	PhaseName	Demobilization/Reclamation
tblOffRoadEquipment	PhaseName	Mobilization
tblOffRoadEquipment	PhaseName	Access Road Realignment
tblOffRoadEquipment	PhaseName	Excavation for Chute Widening
tblOffRoadEquipment	PhaseName	Excavation for Chute Widening
tblOffRoadEquipment	PhaseName	Access Bridge
tblOffRoadEquipment	PhaseName	Mobilization
tblOffRoadEquipment	PhaseName	Access Road Realignment
tblOffRoadEquipment	PhaseName	Mobilization
tblOffRoadEquipment	PhaseName	Access Road Realignment
tblOffRoadEquipment	PhaseName	Access Road Realignment
tblOffRoadEquipment	PhaseName	MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName	Mobilization
tblOffRoadEquipment	PhaseName	Access Road Realignment
tblOffRoadEquipment	PhaseName	Selective Site Demolition
tblOffRoadEquipment	PhaseName	Excavation for Chute Widening
tblOffRoadEquipment	PhaseName	Training Walls and Chute Lining
tblOffRoadEquipment	PhaseName	Training Walls and Chute Lining
tblOffRoadEquipment	PhaseName	MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName	Bridge Pier and Abutment
tblOffRoadEquipment	PhaseName	Bridge Pier and Abutment

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

tblOffRoadEquipment	PhaseName		Access Bridge
tblOffRoadEquipment	PhaseName		Access Bridge
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		Bridge Pier and Abutment
tblOffRoadEquipment	PhaseName		Access Bridge
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		Bridge Pier and Abutment
tblOffRoadEquipment	PhaseName		Access Bridge
tblOffRoadEquipment	PhaseName		Selective Site Demolition
tblOffRoadEquipment	PhaseName		Excavation for Chute Widening
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblProjectCharacteristics	OperationalYear	2018	2023
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00

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tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	0.00	17.00
tblTripsAndVMT	VendorTripNumber	0.00	13.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	25.00	15.00
tblTripsAndVMT	VendorTripNumber	25.00	13.00
tblTripsAndVMT	VendorTripNumber	25.00	15.00
tblTripsAndVMT	VendorTripNumber	25.00	12.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripNumber	23.00	20.00
tblTripsAndVMT	WorkerTripNumber	25.00	24.00
tblTripsAndVMT	WorkerTripNumber	23.00	28.00

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tblTripsAndVMT	WorkerTripNumber	30.00	28.00
tblTripsAndVMT	WorkerTripNumber	65.00	24.00
tblTripsAndVMT	WorkerTripNumber	65.00	28.00
tblTripsAndVMT	WorkerTripNumber	65.00	20.00
tblTripsAndVMT	WorkerTripNumber	65.00	20.00
tblTripsAndVMT	WorkerTripNumber	10.00	20.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00

2.0 Emissions Summary

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.4220	24.6273	20.1662	0.0535							0.0000	5,281.0727	5,281.0727	1.3178	0.0000	5,311.7020
2022	4.6274	39.5989	41.7316	0.1098							0.0000	10,721.8576	10,721.8576	2.8004	0.0000	10,791.8679
2023	3.7340	31.6572	28.8310	0.1010							0.0000	9,991.4493	9,991.4493	2.5667	0.0000	10,055.6181
Maximum	4.6274	39.5989	41.7316	0.1098							0.0000	10,721.8576	10,721.8576	2.8004	0.0000	10,791.8679

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.4220	24.6273	20.1662	0.0535							0.0000	5,281.0727	5,281.0727	1.3178	0.0000	5,311.7019
2022	4.6274	39.5989	41.7316	0.1098							0.0000	10,721.8576	10,721.8576	2.8004	0.0000	10,791.8679
2023	3.7340	31.6572	28.8310	0.1010							0.0000	9,991.4492	9,991.4492	2.5667	0.0000	10,055.6181
Maximum	4.6274	39.5989	41.7316	0.1098							0.0000	10,721.8576	10,721.8576	2.8004	0.0000	10,791.8679

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2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.0065	0.0000	3.6000e-004	0.0000								7.7000e-004	7.7000e-004	0.0000		8.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Total	4.0065	0.0000	3.6000e-004	0.0000								7.7000e-004	7.7000e-004	0.0000	0.0000	8.3000e-004

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.0065	0.0000	3.6000e-004	0.0000								7.7000e-004	7.7000e-004	0.0000		8.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Total	4.0065	0.0000	3.6000e-004	0.0000								7.7000e-004	7.7000e-004	0.0000	0.0000	8.3000e-004

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Site Preparation	10/1/2021	10/31/2021	5	21	
2	Access Road Realignment	Paving	11/1/2021	1/31/2022	5	66	
3	Selective Site Demolition	Demolition	2/1/2022	5/31/2022	5	86	
4	Excavation for Chute Widening	Trenching	3/1/2022	8/31/2022	5	132	
5	Training Walls and Chute Lining	Building Construction	9/1/2022	4/30/2023	5	172	
6	MSE Wall Dam Raise	Building Construction	9/1/2022	12/31/2022	5	87	
7	Bridge Pier and Abutment	Building Construction	1/2/2023	4/30/2023	5	85	
8	Access Bridge	Building Construction	5/1/2023	8/31/2023	5	89	
9	Demobilization/Reclamation	Site Preparation	9/1/2023	9/30/2023	5	21	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.23

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Concrete/Industrial Saws	0	8.00	81	0.73

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Mobilization	Dumpers/Tenders	1	4.00	16	0.38
Mobilization	Excavators	1	4.00	158	0.38
Mobilization	Generator Sets	1	4.00	84	0.74
Mobilization	Graders	1	4.00	187	0.41
Mobilization	Off-Highway Trucks	2	8.00	402	0.38
Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Mobilization	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Mobilization	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Access Road Realignment	Cement and Mortar Mixers	0	6.00	9	0.56
Access Road Realignment	Concrete/Industrial Saws	0		81	0.73
Access Road Realignment	Dumpers/Tenders	1	8.00	16	0.38
Access Road Realignment	Excavators	1	8.00	158	0.38
Access Road Realignment	Generator Sets	1	4.00	84	0.74
Access Road Realignment	Graders	1	8.00	187	0.41
Access Road Realignment	Off-Highway Tractors	2	4.00	124	0.44
Access Road Realignment	Off-Highway Trucks	1	8.00	402	0.38
Access Road Realignment	Pavers	0	8.00	130	0.42
Access Road Realignment	Paving Equipment	0	6.00	132	0.36
Access Road Realignment	Rollers	0	6.00	80	0.38
Access Road Realignment	Tractors/Loaders/Backhoes	2	4.00	97	0.37
Access Road Realignment	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Selective Site Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Selective Site Demolition	Cranes	1	8.00	231	0.29
Selective Site Demolition	Dumpers/Tenders	2	8.00	16	0.38
Selective Site Demolition	Excavators	2	8.00	158	0.38
Selective Site Demolition	Off-Highway Trucks	2	8.00	402	0.38
Selective Site Demolition	Rubber Tired Dozers	0	8.00	247	0.40

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Selective Site Demolition	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Excavation for Chute Widening	Aerial Lifts	1	4.00	63	0.31
Excavation for Chute Widening	Cranes	1	4.00	231	0.29
Excavation for Chute Widening	Dumpers/Tenders	4	8.00	16	0.38
Excavation for Chute Widening	Excavators	1	4.00	158	0.38
Excavation for Chute Widening	Excavators	2	8.00	158	0.38
Excavation for Chute Widening	Off-Highway Trucks	1	8.00	402	0.38
Excavation for Chute Widening	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Training Walls and Chute Lining	Cranes	1	8.00	231	0.29
Training Walls and Chute Lining	Forklifts	0	8.00	89	0.20
Training Walls and Chute Lining	Generator Sets	0	8.00	84	0.74
Training Walls and Chute Lining	Off-Highway Trucks	1	4.00	402	0.38
Training Walls and Chute Lining	Off-Highway Trucks	1	8.00	402	0.38
Training Walls and Chute Lining	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Training Walls and Chute Lining	Welders	0	8.00	46	0.45
MSE Wall Dam Raise	Cranes	0	7.00	231	0.29
MSE Wall Dam Raise	Forklifts	0	8.00	89	0.20
MSE Wall Dam Raise	Generator Sets	0	8.00	84	0.74
MSE Wall Dam Raise	Off-Highway Tractors	1	8.00	124	0.44
MSE Wall Dam Raise	Off-Highway Trucks	1	8.00	402	0.38
MSE Wall Dam Raise	Pavers	1	8.00	130	0.42
MSE Wall Dam Raise	Plate Compactors	4	8.00	8	0.43
MSE Wall Dam Raise	Rollers	2	8.00	80	0.38
MSE Wall Dam Raise	Tractors/Loaders/Backhoes	2	8.00	97	0.37
MSE Wall Dam Raise	Welders	0	8.00	46	0.45
Bridge Pier and Abutment	Cranes	1	8.00	231	0.29
Bridge Pier and Abutment	Forklifts	0	8.00	89	0.20

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Bridge Pier and Abutment	Generator Sets	0	8.00	84	0.74
Bridge Pier and Abutment	Off-Highway Trucks	1	4.00	402	0.38
Bridge Pier and Abutment	Off-Highway Trucks	2	8.00	402	0.38
Bridge Pier and Abutment	Pavers	1	8.00	130	0.42
Bridge Pier and Abutment	Rollers	1	8.00	80	0.38
Bridge Pier and Abutment	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Bridge Pier and Abutment	Welders	0	8.00	46	0.45
Access Bridge	Cranes	1	8.00	231	0.29
Access Bridge	Excavators	1	8.00	158	0.38
Access Bridge	Forklifts	0	8.00	89	0.20
Access Bridge	Generator Sets	0	8.00	84	0.74
Access Bridge	Off-Highway Trucks	1	4.00	402	0.38
Access Bridge	Off-Highway Trucks	2	8.00	402	0.38
Access Bridge	Pavers	1	8.00	130	0.42
Access Bridge	Rollers	1	8.00	80	0.38
Access Bridge	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Access Bridge	Welders	0	8.00	46	0.45
Demobilization/Reclamation	Dumpers/Tenders	1	8.00	16	0.38
Demobilization/Reclamation	Off-Highway Trucks	2	8.00	402	0.38
Demobilization/Reclamation	Rubber Tired Dozers	0	8.00	247	0.40
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	2	8.00	97	0.37

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Demobilization/Reclamation	Generator Sets	2	8.00	84	0.74
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Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	9	20.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Access Road Realignment	10	24.00	17.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Selective Site Demolition	9	28.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Excavation for Chute Widening	12	28.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Training Walls and Chute Lining	4	24.00	15.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
MSE Wall Dam Raise	11	28.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Bridge Pier and Abutment	7	20.00	15.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Access Bridge	8	20.00	12.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	20.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

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3.2 Mobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.2365	21.1206	17.3466	0.0437								4,222.2217	4,222.2217	1.2741		4,254.0745
Total	2.2365	21.1206	17.3466	0.0437								4,222.2217	4,222.2217	1.2741		4,254.0745

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0504	1.4775	0.4291	5.4700e-003								587.7119	587.7119	0.0372		588.6430
Worker	0.1284	0.0804	0.8338	2.6900e-003								267.6762	267.6762	6.4600e-003		267.8378
Total	0.1787	1.5579	1.2629	8.1600e-003								855.3881	855.3881	0.0437		856.4809

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3.2 Mobilization - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.2365	21.1206	17.3466	0.0437							0.0000	4,222.2217	4,222.2217	1.2741		4,254.0745
Total	2.2365	21.1206	17.3466	0.0437							0.0000	4,222.2217	4,222.2217	1.2741		4,254.0745

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0504	1.4775	0.4291	5.4700e-003								587.7119	587.7119	0.0372		588.6430
Worker	0.1284	0.0804	0.8338	2.6900e-003								267.6762	267.6762	6.4600e-003		267.8378
Total	0.1787	1.5579	1.2629	8.1600e-003								855.3881	855.3881	0.0437		856.4809

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3.3 Access Road Realignment - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1637	21.7400	18.3551	0.0400								3,849.7387	3,849.7387	1.1471		3,878.4153
Paving	9.1300e-003												0.0000			0.0000
Total	2.1729	21.7400	18.3551	0.0400								3,849.7387	3,849.7387	1.1471		3,878.4153

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0951	2.7909	0.8106	0.0103								1,110.1226	1,110.1226	0.0704		1,111.8813
Worker	0.1540	0.0965	1.0006	3.2200e-003								321.2114	321.2114	7.7600e-003		321.4054
Total	0.2492	2.8874	1.8112	0.0136								1,431.3340	1,431.3340	0.0781		1,433.2867

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3.3 Access Road Realignment - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1637	21.7400	18.3551	0.0400							0.0000	3,849.7387	3,849.7387	1.1471		3,878.4153
Paving	9.1300e-003												0.0000			0.0000
Total	2.1729	21.7400	18.3551	0.0400							0.0000	3,849.7387	3,849.7387	1.1471		3,878.4153

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0951	2.7909	0.8106	0.0103								1,110.1226	1,110.1226	0.0704		1,111.8813
Worker	0.1540	0.0965	1.0006	3.2200e-003								321.2114	321.2114	7.7600e-003		321.4054
Total	0.2492	2.8874	1.8112	0.0136								1,431.3340	1,431.3340	0.0781		1,433.2867

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

3.3 Access Road Realignment - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9362	18.4825	17.9660	0.0400								3,850.1887	3,850.1887	1.1461		3,878.8415
Paving	9.1300e-003												0.0000			0.0000
Total	1.9453	18.4825	17.9660	0.0400								3,850.1887	3,850.1887	1.1461		3,878.8415

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0887	2.5590	0.7768	0.0102								1,099.4014	1,099.4014	0.0688		1,101.1213
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.2342	2.6462	1.7025	0.0133								1,408.7979	1,408.7979	0.0758		1,410.6930

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

3.3 Access Road Realignment - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9362	18.4825	17.9660	0.0400							0.0000	3,850.1887	3,850.1887	1.1461		3,878.8415
Paving	9.1300e-003												0.0000			0.0000
Total	1.9453	18.4825	17.9660	0.0400							0.0000	3,850.1887	3,850.1887	1.1461		3,878.8415

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0887	2.5590	0.7768	0.0102								1,099.4014	1,099.4014	0.0688		1,101.1213
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.2342	2.6462	1.7025	0.0133								1,408.7979	1,408.7979	0.0758		1,410.6930

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

3.4 Selective Site Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3110	20.0460	20.0976	0.0503								4,841.1900	4,841.1900	1.5394		4,879.6751
Total	2.3110	20.0460	20.0976	0.0503								4,841.1900	4,841.1900	1.5394		4,879.6751

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0678	1.9569	0.5940	7.8100e-003								840.7187	840.7187	0.0526		842.0339
Worker	0.1697	0.1017	1.0799	3.6200e-003								360.9626	360.9626	8.1800e-003		361.1670
Total	0.2376	2.0586	1.6739	0.0114								1,201.6813	1,201.6813	0.0608		1,203.2009

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

3.4 Selective Site Demolition - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3110	20.0460	20.0976	0.0503							0.0000	4,841.1900	4,841.1900	1.5394		4,879.6751
Total	2.3110	20.0460	20.0976	0.0503							0.0000	4,841.1900	4,841.1900	1.5394		4,879.6751

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0678	1.9569	0.5940	7.8100e-003								840.7187	840.7187	0.0526		842.0339
Worker	0.1697	0.1017	1.0799	3.6200e-003								360.9626	360.9626	8.1800e-003		361.1670
Total	0.2376	2.0586	1.6739	0.0114								1,201.6813	1,201.6813	0.0608		1,203.2009

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

3.5 Excavation for Chute Widening - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8622	16.0378	18.4689	0.0391								3,735.9877	3,735.9877	1.1556		3,764.8783
Total	1.8622	16.0378	18.4689	0.0391								3,735.9877	3,735.9877	1.1556		3,764.8783

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0470	1.3548	0.4113	5.4100e-003								582.0360	582.0360	0.0364		582.9466
Worker	0.1697	0.1017	1.0799	3.6200e-003								360.9626	360.9626	8.1800e-003		361.1670
Total	0.2167	1.4565	1.4912	9.0300e-003								942.9986	942.9986	0.0446		944.1136

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

3.5 Excavation for Chute Widening - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8622	16.0378	18.4689	0.0391							0.0000	3,735.9877	3,735.9877	1.1556		3,764.8783
Total	1.8622	16.0378	18.4689	0.0391							0.0000	3,735.9877	3,735.9877	1.1556		3,764.8783

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0470	1.3548	0.4113	5.4100e-003								582.0360	582.0360	0.0364		582.9466
Worker	0.1697	0.1017	1.0799	3.6200e-003								360.9626	360.9626	8.1800e-003		361.1670
Total	0.2167	1.4565	1.4912	9.0300e-003								942.9986	942.9986	0.0446		944.1136

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

3.6 Training Walls and Chute Lining - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3303	11.8805	9.1684	0.0287								2,778.5472	2,778.5472	0.8986		2,801.0132
Total	1.3303	11.8805	9.1684	0.0287								2,778.5472	2,778.5472	0.8986		2,801.0132

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0783	2.2580	0.6854	9.0100e-003								970.0601	970.0601	0.0607		971.5776
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.2237	2.3451	1.6111	0.0121								1,279.4565	1,279.4565	0.0677		1,281.1493

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

3.6 Training Walls and Chute Lining - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3303	11.8805	9.1684	0.0287							0.0000	2,778.5472	2,778.5472	0.8986		2,801.0132
Total	1.3303	11.8805	9.1684	0.0287							0.0000	2,778.5472	2,778.5472	0.8986		2,801.0132

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0783	2.2580	0.6854	9.0100e-003								970.0601	970.0601	0.0607		971.5776
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.2237	2.3451	1.6111	0.0121								1,279.4565	1,279.4565	0.0677		1,281.1493

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

3.6 Training Walls and Chute Lining - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2586	10.7031	8.9985	0.0287								2,780.2285	2,780.2285	0.8992		2,802.7080
Total	1.2586	10.7031	8.9985	0.0287								2,780.2285	2,780.2285	0.8992		2,802.7080

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0575	1.5229	0.6218	8.7900e-003								948.1472	948.1472	0.0567		949.5655
Worker	0.1376	0.0788	0.8545	2.9800e-003								297.5369	297.5369	6.3100e-003		297.6947
Total	0.1951	1.6017	1.4763	0.0118								1,245.6841	1,245.6841	0.0630		1,247.2602

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

3.6 Training Walls and Chute Lining - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2586	10.7031	8.9985	0.0287							0.0000	2,780.2285	2,780.2285	0.8992		2,802.7080
Total	1.2586	10.7031	8.9985	0.0287							0.0000	2,780.2285	2,780.2285	0.8992		2,802.7080

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0575	1.5229	0.6218	8.7900e-003								948.1472	948.1472	0.0567		949.5655
Worker	0.1376	0.0788	0.8545	2.9800e-003								297.5369	297.5369	6.3100e-003		297.6947
Total	0.1951	1.6017	1.4763	0.0118								1,245.6841	1,245.6841	0.0630		1,247.2602

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

3.7 MSE Wall Dam Raise - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7802	16.0752	18.3468	0.0360								3,437.8200	3,437.8200	1.0816		3,464.8594
Total	1.7802	16.0752	18.3468	0.0360								3,437.8200	3,437.8200	1.0816		3,464.8594

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0678	1.9569	0.5940	7.8100e-003								840.7187	840.7187	0.0526		842.0339
Worker	0.1697	0.1017	1.0799	3.6200e-003								360.9626	360.9626	8.1800e-003		361.1670
Total	0.2376	2.0586	1.6739	0.0114								1,201.6813	1,201.6813	0.0608		1,203.2009

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

3.7 MSE Wall Dam Raise - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7802	16.0752	18.3468	0.0360							0.0000	3,437.8200	3,437.8200	1.0816		3,464.8594
Total	1.7802	16.0752	18.3468	0.0360							0.0000	3,437.8200	3,437.8200	1.0816		3,464.8594

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0678	1.9569	0.5940	7.8100e-003								840.7187	840.7187	0.0526		842.0339
Worker	0.1697	0.1017	1.0799	3.6200e-003								360.9626	360.9626	8.1800e-003		361.1670
Total	0.2376	2.0586	1.6739	0.0114								1,201.6813	1,201.6813	0.0608		1,203.2009

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

3.8 Bridge Pier and Abutment - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1081	17.7639	17.0224	0.0493								4,769.4420	4,769.4420	1.5425		4,808.0054
Total	2.1081	17.7639	17.0224	0.0493								4,769.4420	4,769.4420	1.5425		4,808.0054

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0575	1.5229	0.6218	8.7900e-003								948.1472	948.1472	0.0567		949.5655
Worker	0.1147	0.0657	0.7121	2.4900e-003								247.9474	247.9474	5.2600e-003		248.0789
Total	0.1722	1.5886	1.3339	0.0113								1,196.0946	1,196.0946	0.0620		1,197.6444

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

3.8 Bridge Pier and Abutment - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1081	17.7639	17.0224	0.0493							0.0000	4,769.4420	4,769.4420	1.5425		4,808.0054
Total	2.1081	17.7639	17.0224	0.0493							0.0000	4,769.4420	4,769.4420	1.5425		4,808.0054

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0575	1.5229	0.6218	8.7900e-003								948.1472	948.1472	0.0567		949.5655
Worker	0.1147	0.0657	0.7121	2.4900e-003								247.9474	247.9474	5.2600e-003		248.0789
Total	0.1722	1.5886	1.3339	0.0113								1,196.0946	1,196.0946	0.0620		1,197.6444

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

3.9 Access Bridge - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2968	19.3125	20.2801	0.0544								5,269.5476	5,269.5476	1.7043		5,312.1546
Total	2.2968	19.3125	20.2801	0.0544								5,269.5476	5,269.5476	1.7043		5,312.1546

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0460	1.2183	0.4974	7.0300e-003								758.5178	758.5178	0.0454		759.6524
Worker	0.1147	0.0657	0.7121	2.4900e-003								247.9474	247.9474	5.2600e-003		248.0789
Total	0.1607	1.2840	1.2095	9.5200e-003								1,006.4652	1,006.4652	0.0507		1,007.7313

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

3.9 Access Bridge - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2968	19.3125	20.2801	0.0544							0.0000	5,269.5476	5,269.5476	1.7043		5,312.1546
Total	2.2968	19.3125	20.2801	0.0544							0.0000	5,269.5476	5,269.5476	1.7043		5,312.1546

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0460	1.2183	0.4974	7.0300e-003								758.5178	758.5178	0.0454		759.6524
Worker	0.1147	0.0657	0.7121	2.4900e-003								247.9474	247.9474	5.2600e-003		248.0789
Total	0.1607	1.2840	1.2095	9.5200e-003								1,006.4652	1,006.4652	0.0507		1,007.7313

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

3.10 Demobilization/Reclamation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	1.9957	16.1028	18.6292	0.0466								4,469.9395	4,469.9395	1.0843		4,497.0473
Total	1.9957	16.1028	18.6292	0.0466								4,469.9395	4,469.9395	1.0843		4,497.0473

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0345	0.9138	0.3731	5.2700e-003								568.8883	568.8883	0.0340		569.7393
Worker	0.1147	0.0657	0.7121	2.4900e-003								247.9474	247.9474	5.2600e-003		248.0789
Total	0.1492	0.9794	1.0852	7.7600e-003								816.8357	816.8357	0.0393		817.8182

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

3.10 Demobilization/Reclamation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	1.9957	16.1028	18.6292	0.0466							0.0000	4,469.9394	4,469.9394	1.0843		4,497.0473
Total	1.9957	16.1028	18.6292	0.0466							0.0000	4,469.9394	4,469.9394	1.0843		4,497.0473

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0345	0.9138	0.3731	5.2700e-003								568.8883	568.8883	0.0340		569.7393
Worker	0.1147	0.0657	0.7121	2.4900e-003								247.9474	247.9474	5.2600e-003		248.0789
Total	0.1492	0.9794	1.0852	7.7600e-003								816.8357	816.8357	0.0393		817.8182

4.0 Operational Detail - Mobile

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
User Defined Recreational	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0
User Defined Recreational	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.593330	0.040945	0.188012	0.107577	0.017981	0.006204	0.019981	0.018142	0.001176	0.001026	0.003857	0.000384	0.001386
User Defined Recreational	0.593330	0.040945	0.188012	0.107577	0.017981	0.006204	0.019981	0.018142	0.001176	0.001026	0.003857	0.000384	0.001386

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.0065	0.0000	3.6000e-004	0.0000								7.7000e-004	7.7000e-004	0.0000		8.3000e-004
Unmitigated	4.0065	0.0000	3.6000e-004	0.0000								7.7000e-004	7.7000e-004	0.0000		8.3000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.9174												0.0000			0.0000
Consumer Products	3.0891												0.0000			0.0000
Landscaping	3.0000e-005	0.0000	3.6000e-004	0.0000								7.7000e-004	7.7000e-004	0.0000		8.3000e-004
Total	4.0065	0.0000	3.6000e-004	0.0000								7.7000e-004	7.7000e-004	0.0000		8.3000e-004

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.9174												0.0000			0.0000
Consumer Products	3.0891												0.0000			0.0000
Landscaping	3.0000e-005	0.0000	3.6000e-004	0.0000								7.7000e-004	7.7000e-004	0.0000		8.3000e-004
Total	4.0065	0.0000	3.6000e-004	0.0000								7.7000e-004	7.7000e-004	0.0000		8.3000e-004

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Winter

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

Boilers

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

User Defined Equipment

Equipment Type	Number
----------------	--------

11.0 Vegetation

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

**Santa Felicia Dam Spillway Imp Alt 1B
Ventura County, Summer**

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	2.30	Acre	2.30	100,188.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

Project Characteristics - Start of construction based on the schedule provided in the Constructability Analysis report.

Land Use - Acreage based on Constructability Analysis figures.

Construction Phase - Schedule based on Constructability Analysis, Table 3-1.

Off-road Equipment - Concrete Pump Truck, Water Truck, and Flatbed= Off-highway Truck.

Off-road Equipment - Equipment info based on Constructability Analysis report.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Equipment info based on Constructability Analysis report.

Off-road Equipment - Equipment info based on Constructability Analysis, Table 2. Chipper = generator set. Water truck, flatbed truck = off-highway truck.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Flatbed Truck and Water Truck = Off-highway Truck.

Off-road Equipment - flatbed and water truck = off-highway truck.

Trips and VMT - Trip and VMT details based on Constructability Analysis report.

Grading -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Area Coating -

Energy Use -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	0	72092
tblAreaCoating	Area_Nonresidential_Interior	0	216276
tblAreaCoating	Area_Parking	6011	601
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
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tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	7.00	8.00

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblProjectCharacteristics	OperationalYear	2018	2023
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
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tblTripsAndVMT	VendorTripNumber	16.00	7.00
tblTripsAndVMT	VendorTripNumber	16.00	13.00
tblTripsAndVMT	VendorTripNumber	16.00	41.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripNumber	23.00	28.00
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tblTripsAndVMT	WorkerTripNumber	42.00	28.00
tblTripsAndVMT	WorkerTripNumber	42.00	20.00

2.0 Emissions Summary

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.8159	26.2789	22.4822	0.0609							0.0000	5,959.6122	5,959.6122	1.5926	0.0000	5,999.4264
2022	3.9922	34.0740	34.5385	0.1060							0.0000	10,362.6753	10,362.6753	2.7651	0.0000	10,431.8019
2023	1.8121	15.3319	15.9903	0.0668							0.0000	6,727.6252	6,727.6252	1.3937	0.0000	6,762.4665
Maximum	3.9922	34.0740	34.5385	0.1060							0.0000	10,362.6753	10,362.6753	2.7651	0.0000	10,431.8019

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.8159	26.2789	22.4822	0.0609							0.0000	5,959.6122	5,959.6122	1.5926	0.0000	5,999.4264
2022	3.9922	34.0740	34.5385	0.1060							0.0000	10,362.6753	10,362.6753	2.7651	0.0000	10,431.8019
2023	1.8121	15.3319	15.9903	0.0668							0.0000	6,727.6252	6,727.6252	1.3937	0.0000	6,762.4665
Maximum	3.9922	34.0740	34.5385	0.1060							0.0000	10,362.6753	10,362.6753	2.7651	0.0000	10,431.8019

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.9529	0.0000	2.3000e-004	0.0000								5.0000e-004	5.0000e-004	0.0000		5.4000e-004
Energy	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Total	0.9529	0.0000	2.3000e-004	0.0000								5.0000e-004	5.0000e-004	0.0000	0.0000	5.4000e-004

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.9529	0.0000	2.3000e-004	0.0000								5.0000e-004	5.0000e-004	0.0000		5.4000e-004
Energy	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Total	0.9529	0.0000	2.3000e-004	0.0000								5.0000e-004	5.0000e-004	0.0000	0.0000	5.4000e-004

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Site Preparation	10/1/2021	10/31/2021	5	21	
2	Selective Site Demolition	Demolition	11/1/2021	2/28/2022	5	86	
3	Demobilization/Reclamation	Site Preparation	9/1/2023	9/30/2023	5	21	
4	Excavation for Chute Deepening	Trenching	3/1/2022	8/31/2022	5	132	
5	Rock Stabilization/Permanent Facing	Building Construction	3/1/2022	12/31/2022	5	219	
6	MSE Wall Dam Raise	Building Construction	9/1/2022	12/31/2022	5	87	
7	Chute Lining	Building Construction	1/1/2023	8/31/2023	5	174	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 2.3

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Concrete/Industrial Saws	0	8.00	81	0.73
Mobilization	Dumpers/Tenders	1	4.00	16	0.38
Mobilization	Excavators	1	4.00	158	0.38

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

Mobilization	Generator Sets	1	4.00	84	0.74
Mobilization	Graders	1	4.00	187	0.41
Mobilization	Off-Highway Trucks	2	8.00	402	0.38
Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Mobilization	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Selective Site Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Selective Site Demolition	Cranes	1	8.00	231	0.29
Selective Site Demolition	Dumpers/Tenders	2	8.00	16	0.38
Selective Site Demolition	Excavators	2	8.00	158	0.38
Selective Site Demolition	Off-Highway Trucks	2	8.00	402	0.38
Selective Site Demolition	Rubber Tired Dozers	0	8.00	247	0.40
Selective Site Demolition	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demobilization/Reclamation	Dumpers/Tenders	1	8.00	16	0.38
Demobilization/Reclamation	Off-Highway Trucks	2	8.00	402	0.38
Demobilization/Reclamation	Rubber Tired Dozers	0	8.00	247	0.40
Demobilization/Reclamation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Excavation for Chute Deepening	Aerial Lifts	1	4.00	63	0.31
Excavation for Chute Deepening	Cranes	0	0.00	231	0.29
Excavation for Chute Deepening	Dumpers/Tenders	2	8.00	16	0.38
Excavation for Chute Deepening	Excavators	1	4.00	158	0.38

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

Excavation for Chute Deepening	Excavators	1	8.00	158	0.38
Excavation for Chute Deepening	Off-Highway Trucks	1	4.00	402	0.38
Excavation for Chute Deepening	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Rock Stabilization/Permanent Facing	Aerial Lifts	1	8.00	63	0.31
Rock Stabilization/Permanent Facing	Bore/Drill Rigs	1	8.00	221	0.50
Rock Stabilization/Permanent Facing	Off-Highway Trucks	2	8.00	402	0.38
Rock Stabilization/Permanent Facing	Tractors/Loaders/Backhoes	1	8.00	97	0.37
MSE Wall Dam Raise	Cranes	0	7.00	231	0.29
MSE Wall Dam Raise	Forklifts	0	8.00	89	0.20
MSE Wall Dam Raise	Generator Sets	0	8.00	84	0.74
MSE Wall Dam Raise	Off-Highway Tractors	1	8.00	124	0.44
MSE Wall Dam Raise	Off-Highway Trucks	2	8.00	402	0.38
MSE Wall Dam Raise	Pavers	1	8.00	130	0.42
MSE Wall Dam Raise	Plate Compactors	4	8.00	8	0.43
MSE Wall Dam Raise	Rollers	2	8.00	80	0.38
MSE Wall Dam Raise	Tractors/Loaders/Backhoes	1	8.00	97	0.37
MSE Wall Dam Raise	Welders	0	8.00	46	0.45
Chute Lining	Cranes	0	8.00	231	0.29
Chute Lining	Excavators	1	8.00	158	0.38
Chute Lining	Forklifts	0	8.00	89	0.20
Chute Lining	Generator Sets	0	8.00	84	0.74
Chute Lining	Off-Highway Tractors	1	2.00	124	0.44
Chute Lining	Off-Highway Trucks	1	4.00	402	0.38
Chute Lining	Off-Highway Trucks	2	8.00	402	0.38
Chute Lining	Plate Compactors	2	4.00	8	0.43
Chute Lining	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Chute Lining	Welders	0	8.00	46	0.45

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

Demobilization/Reclamation	Generator Sets	2	4.00	84	0.74
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Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	8	20.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Selective Site Demolition	9	28.00	11.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	20.00	7.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Excavation for Chute Deepening	8	24.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Rock Stabilization/Permanent MSE Wall Dam Raise	5	24.00	7.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
MSE Wall Dam Raise	9	28.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Chute Lining	7	20.00	41.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

3.2 Mobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.0492	19.2248	15.0863	0.0406								3,921.3216	3,921.3216	1.1768		3,950.7415
Total	2.0492	19.2248	15.0863	0.0406								3,921.3216	3,921.3216	1.1768		3,950.7415

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0483	1.4557	0.4029	5.5200e-003								593.7979	593.7979	0.0361		594.6995
Worker	0.1088	0.0686	0.8804	2.8200e-003								281.4355	281.4355	6.8000e-003		281.6056
Total	0.1571	1.5242	1.2832	8.3400e-003								875.2334	875.2334	0.0429		876.3050

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

3.2 Mobilization - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.0492	19.2248	15.0863	0.0406							0.0000	3,921.3216	3,921.3216	1.1768		3,950.7415
Total	2.0492	19.2248	15.0863	0.0406							0.0000	3,921.3216	3,921.3216	1.1768		3,950.7415

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0483	1.4557	0.4029	5.5200e-003								593.7979	593.7979	0.0361		594.6995
Worker	0.1088	0.0686	0.8804	2.8200e-003								281.4355	281.4355	6.8000e-003		281.6056
Total	0.1571	1.5242	1.2832	8.3400e-003								875.2334	875.2334	0.0429		876.3050

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

3.3 Selective Site Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6045	24.4038	20.7573	0.0502								4,839.8495	4,839.8495	1.5390		4,878.3237
Total	2.6045	24.4038	20.7573	0.0502								4,839.8495	4,839.8495	1.5390		4,878.3237

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0591	1.7791	0.4924	6.7500e-003								725.7530	725.7530	0.0441		726.8549
Worker	0.1523	0.0960	1.2325	3.9500e-003								394.0097	394.0097	9.5200e-003		394.2478
Total	0.2114	1.8752	1.7249	0.0107								1,119.7627	1,119.7627	0.0536		1,121.1027

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

3.3 Selective Site Demolition - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6045	24.4038	20.7573	0.0502							0.0000	4,839.8495	4,839.8495	1.5390		4,878.3237
Total	2.6045	24.4038	20.7573	0.0502							0.0000	4,839.8495	4,839.8495	1.5390		4,878.3237

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0591	1.7791	0.4924	6.7500e-003								725.7530	725.7530	0.0441		726.8549
Worker	0.1523	0.0960	1.2325	3.9500e-003								394.0097	394.0097	9.5200e-003		394.2478
Total	0.2114	1.8752	1.7249	0.0107								1,119.7627	1,119.7627	0.0536		1,121.1027

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

3.3 Selective Site Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3110	20.0460	20.0976	0.0503								4,841.1900	4,841.1900	1.5394		4,879.6751
Total	2.3110	20.0460	20.0976	0.0503								4,841.1900	4,841.1900	1.5394		4,879.6751

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0551	1.6334	0.4722	6.6800e-003								718.8063	718.8063	0.0432		719.8853
Worker	0.1435	0.0868	1.1425	3.8100e-003								379.5067	379.5067	8.6200e-003		379.7222
Total	0.1986	1.7202	1.6147	0.0105								1,098.3130	1,098.3130	0.0518		1,099.6075

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

3.3 Selective Site Demolition - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3110	20.0460	20.0976	0.0503							0.0000	4,841.1900	4,841.1900	1.5394		4,879.6751
Total	2.3110	20.0460	20.0976	0.0503							0.0000	4,841.1900	4,841.1900	1.5394		4,879.6751

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0551	1.6334	0.4722	6.6800e-003								718.8063	718.8063	0.0432		719.8853
Worker	0.1435	0.0868	1.1425	3.8100e-003								379.5067	379.5067	8.6200e-003		379.7222
Total	0.1986	1.7202	1.6147	0.0105								1,098.3130	1,098.3130	0.0518		1,099.6075

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

3.4 Demobilization/Reclamation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	1.6898	13.3873	14.9598	0.0400								3,846.9049	3,846.9049	1.0569		3,873.3275
Total	1.6898	13.3873	14.9598	0.0400								3,846.9049	3,846.9049	1.0569		3,873.3275

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0257	0.7046	0.2754	4.1400e-003								447.1211	447.1211	0.0258		447.7661
Worker	0.0966	0.0560	0.7551	2.6100e-003								260.6787	260.6787	5.5600e-003		260.8176
Total	0.1223	0.7606	1.0305	6.7500e-003								707.7998	707.7998	0.0314		708.5838

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

3.4 Demobilization/Reclamation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	1.6898	13.3873	14.9598	0.0400							0.0000	3,846.9049	3,846.9049	1.0569		3,873.3275
Total	1.6898	13.3873	14.9598	0.0400							0.0000	3,846.9049	3,846.9049	1.0569		3,873.3275

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0257	0.7046	0.2754	4.1400e-003								447.1211	447.1211	0.0258		447.7661
Worker	0.0966	0.0560	0.7551	2.6100e-003								260.6787	260.6787	5.5600e-003		260.8176
Total	0.1223	0.7606	1.0305	6.7500e-003								707.7998	707.7998	0.0314		708.5838

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

3.5 Excavation for Chute Deepening - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0622	9.2328	12.0866	0.0229								2,195.1840	2,195.1840	0.6836		2,212.2748
Total	1.0622	9.2328	12.0866	0.0229								2,195.1840	2,195.1840	0.6836		2,212.2748

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0451	1.3364	0.3864	5.4600e-003								588.1142	588.1142	0.0353		588.9971
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.1681	1.4108	1.3657	8.7200e-003								913.4057	913.4057	0.0427		914.4733

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

3.5 Excavation for Chute Deepening - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0622	9.2328	12.0866	0.0229							0.0000	2,195.1840	2,195.1840	0.6836		2,212.2748
Total	1.0622	9.2328	12.0866	0.0229							0.0000	2,195.1840	2,195.1840	0.6836		2,212.2748

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0451	1.3364	0.3864	5.4600e-003								588.1142	588.1142	0.0353		588.9971
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.1681	1.4108	1.3657	8.7200e-003								913.4057	913.4057	0.0427		914.4733

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

3.6 Rock Stabilization/Permanent Facing - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4817	12.5298	12.0905	0.0407								3,935.3902	3,935.3902	1.2728		3,967.2098
Total	1.4817	12.5298	12.0905	0.0407								3,935.3902	3,935.3902	1.2728		3,967.2098

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0351	1.0395	0.3005	4.2500e-003								457.4222	457.4222	0.0275		458.1088
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.1580	1.1138	1.2798	7.5100e-003								782.7137	782.7137	0.0349		783.5850

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

3.6 Rock Stabilization/Permanent Facing - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4817	12.5298	12.0905	0.0407							0.0000	3,935.3902	3,935.3902	1.2728		3,967.2098
Total	1.4817	12.5298	12.0905	0.0407							0.0000	3,935.3902	3,935.3902	1.2728		3,967.2098

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0351	1.0395	0.3005	4.2500e-003								457.4222	457.4222	0.0275		458.1088
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.1580	1.1138	1.2798	7.5100e-003								782.7137	782.7137	0.0349		783.5850

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

3.7 MSE Wall Dam Raise - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1439	18.4132	19.4676	0.0461								4,415.5664	4,415.5664	1.3978		4,450.5113
Total	2.1439	18.4132	19.4676	0.0461								4,415.5664	4,415.5664	1.3978		4,450.5113

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0651	1.9304	0.5581	7.8900e-003								849.4984	849.4984	0.0510		850.7735
Worker	0.1435	0.0868	1.1425	3.8100e-003								379.5067	379.5067	8.6200e-003		379.7222
Total	0.2086	2.0172	1.7006	0.0117								1,229.0051	1,229.0051	0.0596		1,230.4957

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

3.7 MSE Wall Dam Raise - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1439	18.4132	19.4676	0.0461							0.0000	4,415.5664	4,415.5664	1.3978		4,450.5113
Total	2.1439	18.4132	19.4676	0.0461							0.0000	4,415.5664	4,415.5664	1.3978		4,450.5113

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0651	1.9304	0.5581	7.8900e-003								849.4984	849.4984	0.0510		850.7735
Worker	0.1435	0.0868	1.1425	3.8100e-003								379.5067	379.5067	8.6200e-003		379.7222
Total	0.2086	2.0172	1.7006	0.0117								1,229.0051	1,229.0051	0.0596		1,230.4957

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

3.8 Chute Lining - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5368	11.1490	12.4456	0.0399								3,848.0942	3,848.0942	1.2370		3,879.0187
Total	1.5368	11.1490	12.4456	0.0399								3,848.0942	3,848.0942	1.2370		3,879.0187

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1503	4.1268	1.6128	0.0243								2,618.8523	2,618.8523	0.1511		2,622.6301
Worker	0.0966	0.0560	0.7551	2.6100e-003								260.6787	260.6787	5.5600e-003		260.8176
Total	0.2470	4.1828	2.3679	0.0269								2,879.5310	2,879.5310	0.1567		2,883.4477

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

3.8 Chute Lining - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5368	11.1490	12.4456	0.0399							0.0000	3,848.0942	3,848.0942	1.2370		3,879.0187
Total	1.5368	11.1490	12.4456	0.0399							0.0000	3,848.0942	3,848.0942	1.2370		3,879.0187

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1503	4.1268	1.6128	0.0243								2,618.8523	2,618.8523	0.1511		2,622.6301
Worker	0.0966	0.0560	0.7551	2.6100e-003								260.6787	260.6787	5.5600e-003		260.8176
Total	0.2470	4.1828	2.3679	0.0269								2,879.5310	2,879.5310	0.1567		2,883.4477

4.0 Operational Detail - Mobile

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Mitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000			0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000			0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.593330	0.040945	0.188012	0.107577	0.017981	0.006204	0.019981	0.018142	0.001176	0.001026	0.003857	0.000384	0.001386

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.9529	0.0000	2.3000e-004	0.0000								5.0000e-004	5.0000e-004	0.0000		5.4000e-004
Unmitigated	0.9529	0.0000	2.3000e-004	0.0000								5.0000e-004	5.0000e-004	0.0000		5.4000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.9174												0.0000			0.0000
Consumer Products	0.0355												0.0000			0.0000
Landscaping	2.0000e-005	0.0000	2.3000e-004	0.0000								5.0000e-004	5.0000e-004	0.0000		5.4000e-004
Total	0.9529	0.0000	2.3000e-004	0.0000								5.0000e-004	5.0000e-004	0.0000		5.4000e-004

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.9174												0.0000			0.0000
Consumer Products	0.0355												0.0000			0.0000
Landscaping	2.0000e-005	0.0000	2.3000e-004	0.0000								5.0000e-004	5.0000e-004	0.0000		5.4000e-004
Total	0.9529	0.0000	2.3000e-004	0.0000								5.0000e-004	5.0000e-004	0.0000		5.4000e-004

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Summer

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

Boilers

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

User Defined Equipment

Equipment Type	Number
----------------	--------

11.0 Vegetation

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

Santa Felicia Dam Spillway Imp Alt 1B
Ventura County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	2.30	Acre	2.30	100,188.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

Project Characteristics - Start of construction based on the schedule provided in the Constructability Analysis report.

Land Use - Acreage based on Constructability Analysis figures.

Construction Phase - Schedule based on Constructability Analysis, Table 3-1.

Off-road Equipment - Concrete Pump Truck, Water Truck, and Flatbed= Off-highway Truck.

Off-road Equipment - Equipment info based on Constructability Analysis report.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Equipment info based on Constructability Analysis report.

Off-road Equipment - Equipment info based on Constructability Analysis, Table 2. Chipper = generator set. Water truck, flatbed truck = off-highway truck.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Flatbed Truck and Water Truck = Off-highway Truck.

Off-road Equipment - flatbed and water truck = off-highway truck.

Trips and VMT - Trip and VMT details based on Constructability Analysis report.

Grading -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Area Coating -

Energy Use -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	0	72092
tblAreaCoating	Area_Nonresidential_Interior	0	216276
tblAreaCoating	Area_Parking	6011	601
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
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tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
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tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
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tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	7.00	8.00

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblProjectCharacteristics	OperationalYear	2018	2023
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
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tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	16.00	7.00
tblTripsAndVMT	VendorTripNumber	16.00	13.00
tblTripsAndVMT	VendorTripNumber	16.00	41.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripNumber	23.00	28.00
tblTripsAndVMT	WorkerTripNumber	10.00	20.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	20.00	24.00
tblTripsAndVMT	WorkerTripNumber	42.00	24.00
tblTripsAndVMT	WorkerTripNumber	42.00	28.00
tblTripsAndVMT	WorkerTripNumber	42.00	20.00

2.0 Emissions Summary

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.8458	26.3222	22.4491	0.0607							0.0000	5,932.9108	5,932.9108	1.5935	0.0000	5,972.7493
2022	4.0452	34.1425	34.4775	0.1055							0.0000	10,314.7290	10,314.7290	2.7667	0.0000	10,383.8967
2023	1.8313	15.3773	15.9621	0.0664							0.0000	6,687.6440	6,687.6440	1.3973	0.0000	6,722.5768
Maximum	4.0452	34.1425	34.4775	0.1055							0.0000	10,314.7290	10,314.7290	2.7667	0.0000	10,383.8967

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.8458	26.3222	22.4491	0.0607							0.0000	5,932.9108	5,932.9108	1.5935	0.0000	5,972.7493
2022	4.0452	34.1425	34.4775	0.1055							0.0000	10,314.7290	10,314.7290	2.7667	0.0000	10,383.8967
2023	1.8313	15.3773	15.9621	0.0664							0.0000	6,687.6440	6,687.6440	1.3973	0.0000	6,722.5768
Maximum	4.0452	34.1425	34.4775	0.1055							0.0000	10,314.7290	10,314.7290	2.7667	0.0000	10,383.8967

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.9529	0.0000	2.3000e-004	0.0000								5.0000e-004	5.0000e-004	0.0000		5.4000e-004
Energy	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Total	0.9529	0.0000	2.3000e-004	0.0000								5.0000e-004	5.0000e-004	0.0000	0.0000	5.4000e-004

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.9529	0.0000	2.3000e-004	0.0000								5.0000e-004	5.0000e-004	0.0000		5.4000e-004
Energy	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Total	0.9529	0.0000	2.3000e-004	0.0000								5.0000e-004	5.0000e-004	0.0000	0.0000	5.4000e-004

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Site Preparation	10/1/2021	10/31/2021	5	21	
2	Selective Site Demolition	Demolition	11/1/2021	2/28/2022	5	86	
3	Demobilization/Reclamation	Site Preparation	9/1/2023	9/30/2023	5	21	
4	Excavation for Chute Deepening	Trenching	3/1/2022	8/31/2022	5	132	
5	Rock Stabilization/Permanent Facing	Building Construction	3/1/2022	12/31/2022	5	219	
6	MSE Wall Dam Raise	Building Construction	9/1/2022	12/31/2022	5	87	
7	Chute Lining	Building Construction	1/1/2023	8/31/2023	5	174	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 2.3

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Concrete/Industrial Saws	0	8.00	81	0.73
Mobilization	Dumpers/Tenders	1	4.00	16	0.38
Mobilization	Excavators	1	4.00	158	0.38

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

Mobilization	Generator Sets	1	4.00	84	0.74
Mobilization	Graders	1	4.00	187	0.41
Mobilization	Off-Highway Trucks	2	8.00	402	0.38
Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Mobilization	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Selective Site Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Selective Site Demolition	Cranes	1	8.00	231	0.29
Selective Site Demolition	Dumpers/Tenders	2	8.00	16	0.38
Selective Site Demolition	Excavators	2	8.00	158	0.38
Selective Site Demolition	Off-Highway Trucks	2	8.00	402	0.38
Selective Site Demolition	Rubber Tired Dozers	0	8.00	247	0.40
Selective Site Demolition	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demobilization/Reclamation	Dumpers/Tenders	1	8.00	16	0.38
Demobilization/Reclamation	Off-Highway Trucks	2	8.00	402	0.38
Demobilization/Reclamation	Rubber Tired Dozers	0	8.00	247	0.40
Demobilization/Reclamation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Excavation for Chute Deepening	Aerial Lifts	1	4.00	63	0.31
Excavation for Chute Deepening	Cranes	0	0.00	231	0.29
Excavation for Chute Deepening	Dumpers/Tenders	2	8.00	16	0.38
Excavation for Chute Deepening	Excavators	1	4.00	158	0.38

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

Excavation for Chute Deepening	Excavators	1	8.00	158	0.38
Excavation for Chute Deepening	Off-Highway Trucks	1	4.00	402	0.38
Excavation for Chute Deepening	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Rock Stabilization/Permanent Facing	Aerial Lifts	1	8.00	63	0.31
Rock Stabilization/Permanent Facing	Bore/Drill Rigs	1	8.00	221	0.50
Rock Stabilization/Permanent Facing	Off-Highway Trucks	2	8.00	402	0.38
Rock Stabilization/Permanent Facing	Tractors/Loaders/Backhoes	1	8.00	97	0.37
MSE Wall Dam Raise	Cranes	0	7.00	231	0.29
MSE Wall Dam Raise	Forklifts	0	8.00	89	0.20
MSE Wall Dam Raise	Generator Sets	0	8.00	84	0.74
MSE Wall Dam Raise	Off-Highway Tractors	1	8.00	124	0.44
MSE Wall Dam Raise	Off-Highway Trucks	2	8.00	402	0.38
MSE Wall Dam Raise	Pavers	1	8.00	130	0.42
MSE Wall Dam Raise	Plate Compactors	4	8.00	8	0.43
MSE Wall Dam Raise	Rollers	2	8.00	80	0.38
MSE Wall Dam Raise	Tractors/Loaders/Backhoes	1	8.00	97	0.37
MSE Wall Dam Raise	Welders	0	8.00	46	0.45
Chute Lining	Cranes	0	8.00	231	0.29
Chute Lining	Excavators	1	8.00	158	0.38
Chute Lining	Forklifts	0	8.00	89	0.20
Chute Lining	Generator Sets	0	8.00	84	0.74
Chute Lining	Off-Highway Tractors	1	2.00	124	0.44
Chute Lining	Off-Highway Trucks	1	4.00	402	0.38
Chute Lining	Off-Highway Trucks	2	8.00	402	0.38
Chute Lining	Plate Compactors	2	4.00	8	0.43
Chute Lining	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Chute Lining	Welders	0	8.00	46	0.45

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

Demobilization/Reclamation	Generator Sets	2	4.00	84	0.74
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Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	8	20.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Selective Site Demolition	9	28.00	11.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	20.00	7.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Excavation for Chute Deepening	8	24.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Rock Stabilization/Permanent MSE Wall Dam Raise	5	24.00	7.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
MSE Wall Dam Raise	9	28.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Chute Lining	7	20.00	41.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

3.2 Mobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.0492	19.2248	15.0863	0.0406								3,921.3216	3,921.3216	1.1768		3,950.7415
Total	2.0492	19.2248	15.0863	0.0406								3,921.3216	3,921.3216	1.1768		3,950.7415

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0504	1.4775	0.4291	5.4700e-003								587.7119	587.7119	0.0372		588.6430
Worker	0.1284	0.0804	0.8338	2.6900e-003								267.6762	267.6762	6.4600e-003		267.8378
Total	0.1787	1.5579	1.2629	8.1600e-003								855.3881	855.3881	0.0437		856.4809

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

3.2 Mobilization - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.0492	19.2248	15.0863	0.0406							0.0000	3,921.3216	3,921.3216	1.1768		3,950.7415
Total	2.0492	19.2248	15.0863	0.0406							0.0000	3,921.3216	3,921.3216	1.1768		3,950.7415

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0504	1.4775	0.4291	5.4700e-003								587.7119	587.7119	0.0372		588.6430
Worker	0.1284	0.0804	0.8338	2.6900e-003								267.6762	267.6762	6.4600e-003		267.8378
Total	0.1787	1.5579	1.2629	8.1600e-003								855.3881	855.3881	0.0437		856.4809

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

3.3 Selective Site Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6045	24.4038	20.7573	0.0502								4,839.8495	4,839.8495	1.5390		4,878.3237
Total	2.6045	24.4038	20.7573	0.0502								4,839.8495	4,839.8495	1.5390		4,878.3237

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0615	1.8059	0.5245	6.6800e-003								718.3146	718.3146	0.0455		719.4526
Worker	0.1797	0.1126	1.1673	3.7600e-003								374.7467	374.7467	9.0500e-003		374.9729
Total	0.2413	1.9184	1.6918	0.0104								1,093.0613	1,093.0613	0.0546		1,094.4256

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

3.3 Selective Site Demolition - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6045	24.4038	20.7573	0.0502							0.0000	4,839.8495	4,839.8495	1.5390		4,878.3237
Total	2.6045	24.4038	20.7573	0.0502							0.0000	4,839.8495	4,839.8495	1.5390		4,878.3237

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0615	1.8059	0.5245	6.6800e-003								718.3146	718.3146	0.0455		719.4526
Worker	0.1797	0.1126	1.1673	3.7600e-003								374.7467	374.7467	9.0500e-003		374.9729
Total	0.2413	1.9184	1.6918	0.0104								1,093.0613	1,093.0613	0.0546		1,094.4256

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

3.3 Selective Site Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3110	20.0460	20.0976	0.0503								4,841.1900	4,841.1900	1.5394		4,879.6751
Total	2.3110	20.0460	20.0976	0.0503								4,841.1900	4,841.1900	1.5394		4,879.6751

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0574	1.6558	0.5026	6.6100e-003								711.3774	711.3774	0.0445		712.4902
Worker	0.1697	0.1017	1.0799	3.6200e-003								360.9626	360.9626	8.1800e-003		361.1670
Total	0.2271	1.7575	1.5826	0.0102								1,072.3399	1,072.3399	0.0527		1,073.6573

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

3.3 Selective Site Demolition - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3110	20.0460	20.0976	0.0503							0.0000	4,841.1900	4,841.1900	1.5394		4,879.6751
Total	2.3110	20.0460	20.0976	0.0503							0.0000	4,841.1900	4,841.1900	1.5394		4,879.6751

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0574	1.6558	0.5026	6.6100e-003								711.3774	711.3774	0.0445		712.4902
Worker	0.1697	0.1017	1.0799	3.6200e-003								360.9626	360.9626	8.1800e-003		361.1670
Total	0.2271	1.7575	1.5826	0.0102								1,072.3399	1,072.3399	0.0527		1,073.6573

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

3.4 Demobilization/Reclamation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	1.6898	13.3873	14.9598	0.0400								3,846.9049	3,846.9049	1.0569		3,873.3275
Total	1.6898	13.3873	14.9598	0.0400								3,846.9049	3,846.9049	1.0569		3,873.3275

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0268	0.7107	0.2902	4.1000e-003								442.4687	442.4687	0.0265		443.1306
Worker	0.1147	0.0657	0.7121	2.4900e-003								247.9474	247.9474	5.2600e-003		248.0789
Total	0.1415	0.7764	1.0023	6.5900e-003								690.4161	690.4161	0.0317		691.2095

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

3.4 Demobilization/Reclamation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	1.6898	13.3873	14.9598	0.0400							0.0000	3,846.9049	3,846.9049	1.0569		3,873.3275
Total	1.6898	13.3873	14.9598	0.0400							0.0000	3,846.9049	3,846.9049	1.0569		3,873.3275

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0268	0.7107	0.2902	4.1000e-003								442.4687	442.4687	0.0265		443.1306
Worker	0.1147	0.0657	0.7121	2.4900e-003								247.9474	247.9474	5.2600e-003		248.0789
Total	0.1415	0.7764	1.0023	6.5900e-003								690.4161	690.4161	0.0317		691.2095

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

3.5 Excavation for Chute Deepening - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0622	9.2328	12.0866	0.0229								2,195.1840	2,195.1840	0.6836		2,212.2748
Total	1.0622	9.2328	12.0866	0.0229								2,195.1840	2,195.1840	0.6836		2,212.2748

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0470	1.3548	0.4113	5.4100e-003								582.0360	582.0360	0.0364		582.9466
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.1924	1.4419	1.3369	8.5100e-003								891.4325	891.4325	0.0434		892.5183

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

3.5 Excavation for Chute Deepening - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0622	9.2328	12.0866	0.0229							0.0000	2,195.1840	2,195.1840	0.6836		2,212.2748
Total	1.0622	9.2328	12.0866	0.0229							0.0000	2,195.1840	2,195.1840	0.6836		2,212.2748

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0470	1.3548	0.4113	5.4100e-003								582.0360	582.0360	0.0364		582.9466
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.1924	1.4419	1.3369	8.5100e-003								891.4325	891.4325	0.0434		892.5183

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

3.6 Rock Stabilization/Permanent Facing - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4817	12.5298	12.0905	0.0407								3,935.3902	3,935.3902	1.2728		3,967.2098
Total	1.4817	12.5298	12.0905	0.0407								3,935.3902	3,935.3902	1.2728		3,967.2098

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0365	1.0537	0.3199	4.2000e-003								452.6947	452.6947	0.0283		453.4029
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.1820	1.1409	1.2455	7.3000e-003								762.0912	762.0912	0.0353		762.9746

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

3.6 Rock Stabilization/Permanent Facing - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4817	12.5298	12.0905	0.0407							0.0000	3,935.3902	3,935.3902	1.2728		3,967.2098
Total	1.4817	12.5298	12.0905	0.0407							0.0000	3,935.3902	3,935.3902	1.2728		3,967.2098

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0365	1.0537	0.3199	4.2000e-003								452.6947	452.6947	0.0283		453.4029
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.1820	1.1409	1.2455	7.3000e-003								762.0912	762.0912	0.0353		762.9746

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

3.7 MSE Wall Dam Raise - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1439	18.4132	19.4676	0.0461								4,415.5664	4,415.5664	1.3978		4,450.5113
Total	2.1439	18.4132	19.4676	0.0461								4,415.5664	4,415.5664	1.3978		4,450.5113

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0678	1.9569	0.5940	7.8100e-003								840.7187	840.7187	0.0526		842.0339
Worker	0.1697	0.1017	1.0799	3.6200e-003								360.9626	360.9626	8.1800e-003		361.1670
Total	0.2376	2.0586	1.6739	0.0114								1,201.6813	1,201.6813	0.0608		1,203.2009

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

3.7 MSE Wall Dam Raise - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1439	18.4132	19.4676	0.0461							0.0000	4,415.5664	4,415.5664	1.3978		4,450.5113
Total	2.1439	18.4132	19.4676	0.0461							0.0000	4,415.5664	4,415.5664	1.3978		4,450.5113

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0678	1.9569	0.5940	7.8100e-003								840.7187	840.7187	0.0526		842.0339
Worker	0.1697	0.1017	1.0799	3.6200e-003								360.9626	360.9626	8.1800e-003		361.1670
Total	0.2376	2.0586	1.6739	0.0114								1,201.6813	1,201.6813	0.0608		1,203.2009

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

3.8 Chute Lining - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5368	11.1490	12.4456	0.0399								3,848.0942	3,848.0942	1.2370		3,879.0187
Total	1.5368	11.1490	12.4456	0.0399								3,848.0942	3,848.0942	1.2370		3,879.0187

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1572	4.1626	1.6995	0.0240								2,591.6024	2,591.6024	0.1551		2,595.4792
Worker	0.1147	0.0657	0.7121	2.4900e-003								247.9474	247.9474	5.2600e-003		248.0789
Total	0.2719	4.2283	2.4116	0.0265								2,839.5498	2,839.5498	0.1603		2,843.5581

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

3.8 Chute Lining - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5368	11.1490	12.4456	0.0399							0.0000	3,848.0942	3,848.0942	1.2370		3,879.0187
Total	1.5368	11.1490	12.4456	0.0399							0.0000	3,848.0942	3,848.0942	1.2370		3,879.0187

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1572	4.1626	1.6995	0.0240								2,591.6024	2,591.6024	0.1551		2,595.4792
Worker	0.1147	0.0657	0.7121	2.4900e-003								247.9474	247.9474	5.2600e-003		248.0789
Total	0.2719	4.2283	2.4116	0.0265								2,839.5498	2,839.5498	0.1603		2,843.5581

4.0 Operational Detail - Mobile

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.593330	0.040945	0.188012	0.107577	0.017981	0.006204	0.019981	0.018142	0.001176	0.001026	0.003857	0.000384	0.001386

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.9529	0.0000	2.3000e-004	0.0000								5.0000e-004	5.0000e-004	0.0000		5.4000e-004
Unmitigated	0.9529	0.0000	2.3000e-004	0.0000								5.0000e-004	5.0000e-004	0.0000		5.4000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.9174												0.0000			0.0000
Consumer Products	0.0355												0.0000			0.0000
Landscaping	2.0000e-005	0.0000	2.3000e-004	0.0000								5.0000e-004	5.0000e-004	0.0000		5.4000e-004
Total	0.9529	0.0000	2.3000e-004	0.0000								5.0000e-004	5.0000e-004	0.0000		5.4000e-004

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.9174												0.0000			0.0000
Consumer Products	0.0355												0.0000			0.0000
Landscaping	2.0000e-005	0.0000	2.3000e-004	0.0000								5.0000e-004	5.0000e-004	0.0000		5.4000e-004
Total	0.9529	0.0000	2.3000e-004	0.0000								5.0000e-004	5.0000e-004	0.0000		5.4000e-004

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

Fire Pumps and Emergency Generators

Santa Felicia Dam Spillway Imp Alt 1B - Ventura County, Winter

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

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

Equipment Type	Number
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11.0 Vegetation

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

Santa Felicia Dam Spillway Imp Alt 2A
Ventura County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	5.79	Acre	5.79	252,212.40	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

Project Characteristics - Start of construction based on the schedule provided in the Constructability Analysis report.

Land Use - Acreage based on Constructability Analysis figures.

Construction Phase - Schedule based on Constructability Analysis, Table 3-1.

Off-road Equipment - Concrete Pump Truck, Water Truck, and Flatbed= Off-highway Truck.

Off-road Equipment - Flatbed, concrete pump truck, and water truck = Off-highway truck

Off-road Equipment - Water Truck= Off-highway truck, Compactor - off-highway tractor.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Water truck= off-highway truck

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Equipment info based on Constructability Analysis, Table 2. Chipper = generator set. Water truck, flatbed truck = off-highway truck.

Off-road Equipment - flatbed and water truck = off-highway truck.

Off-road Equipment - Water truck and concrete pump truck = off-highway truck

Trips and VMT - Trip count taken from Constructability Analysis report. It is assumed that workers and vendors will be coming from the cities of Castaic and Santa Clarita, roughly 20 miles to the east.

Grading -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Area Coating -

Energy Use -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	0	72092
tblAreaCoating	Area_Nonresidential_Interior	0	216276
tblAreaCoating	Area_Parking	15133	601
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Pavers
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
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tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Bridge Pier and Abutment
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tblOffRoadEquipment	UsageHours	7.00	2.00
tblOffRoadEquipment	UsageHours	7.00	8.00
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tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00

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tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblProjectCharacteristics	OperationalYear	2018	2023
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
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tblTripsAndVMT	VendorTripNumber	0.00	13.00
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tblTripsAndVMT	VendorTripNumber	41.00	53.00
tblTripsAndVMT	VendorTripNumber	41.00	13.00
tblTripsAndVMT	VendorTripNumber	41.00	13.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
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tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
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2.0 Emissions Summary

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.5939	23.9249	19.9934	0.0518							0.0000	5,090.9354	5,090.9354	1.2390	0.0000	5,121.9093
2022	4.5703	39.5242	41.7960	0.1223							0.0000	12,304.7924	12,304.7924	2.7986	0.0000	12,368.4646
2023	5.8304	51.4187	46.9683	0.1807							0.0000	18,040.5452	18,040.5452	4.1261	0.0000	18,143.6973
Maximum	5.8304	51.4187	46.9683	0.1807							0.0000	18,040.5452	18,040.5452	4.1261	0.0000	18,143.6973

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.5939	23.9249	19.9934	0.0518							0.0000	5,090.9354	5,090.9354	1.2390	0.0000	5,121.9093
2022	4.5703	39.5242	41.7960	0.1223							0.0000	12,304.7924	12,304.7924	2.7986	0.0000	12,368.4646
2023	5.8304	51.4187	46.9683	0.1807							0.0000	18,040.5452	18,040.5452	4.1261	0.0000	18,143.6973
Maximum	5.8304	51.4187	46.9683	0.1807							0.0000	18,040.5452	18,040.5452	4.1261	0.0000	18,143.6973

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0068	1.0000e-005	5.9000e-004	0.0000								1.2700e-003	1.2700e-003	0.0000		1.3500e-003
Energy	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Total	1.0068	1.0000e-005	5.9000e-004	0.0000								1.2700e-003	1.2700e-003	0.0000	0.0000	1.3500e-003

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0068	1.0000e-005	5.9000e-004	0.0000								1.2700e-003	1.2700e-003	0.0000		1.3500e-003
Energy	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Total	1.0068	1.0000e-005	5.9000e-004	0.0000								1.2700e-003	1.2700e-003	0.0000	0.0000	1.3500e-003

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Site Preparation	10/1/2021	10/31/2021	5	21	
2	Access Road Realignment	Paving	11/1/2021	1/31/2022	5	66	
3	Selective Site Demolition	Demolition	2/1/2022	5/31/2022	5	86	
4	Excavation for Chute Widening	Trenching	3/1/2022	8/31/2022	5	132	
5	Training Walls and Chute Lining	Building Construction	9/1/2022	4/30/2023	5	172	
6	Labyrinth Weir	Building Construction	9/1/2022	4/30/2023	5	172	
7	Bridge Pier and Abutment	Building Construction	1/2/2023	4/30/2023	5	85	
8	Access Bridge	Building Construction	5/1/2023	8/31/2023	5	89	
9	Demobilization/Reclamation	Site Preparation	9/1/2023	9/30/2023	5	21	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 5.79

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Concrete/Industrial Saws	0	8.00	81	0.73

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Mobilization	Dumpers/Tenders	1	8.00	16	0.38
Mobilization	Excavators	1	4.00	158	0.38
Mobilization	Generator Sets	1	4.00	84	0.74
Mobilization	Graders	1	4.00	187	0.41
Mobilization	Off-Highway Trucks	2	8.00	402	0.38
Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Mobilization	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Access Road Realignment	Cement and Mortar Mixers	0	6.00	9	0.56
Access Road Realignment	Concrete/Industrial Saws	0		81	0.73
Access Road Realignment	Dumpers/Tenders	1	8.00	16	0.38
Access Road Realignment	Excavators	1	8.00	158	0.38
Access Road Realignment	Generator Sets	1	4.00	84	0.74
Access Road Realignment	Graders	1	8.00	187	0.41
Access Road Realignment	Off-Highway Tractors	2	4.00	124	0.44
Access Road Realignment	Off-Highway Trucks	1	8.00	402	0.38
Access Road Realignment	Pavers	0	8.00	130	0.42
Access Road Realignment	Paving Equipment	0	6.00	132	0.36
Access Road Realignment	Rollers	0	6.00	80	0.38
Access Road Realignment	Tractors/Loaders/Backhoes	2	4.00	97	0.37
Access Road Realignment	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Selective Site Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Selective Site Demolition	Cranes	1	8.00	231	0.29
Selective Site Demolition	Dumpers/Tenders	2	8.00	16	0.38
Selective Site Demolition	Excavators	2	8.00	158	0.38
Selective Site Demolition	Off-Highway Trucks	2	8.00	402	0.38
Selective Site Demolition	Rubber Tired Dozers	0	8.00	247	0.40

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Selective Site Demolition	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Excavation for Chute Widening	Aerial Lifts	1	4.00	63	0.31
Excavation for Chute Widening	Cranes	1	4.00	231	0.29
Excavation for Chute Widening	Dumpers/Tenders	4	8.00	16	0.38
Excavation for Chute Widening	Excavators	1	4.00	158	0.38
Excavation for Chute Widening	Excavators	2	8.00	158	0.38
Excavation for Chute Widening	Off-Highway Trucks	1	8.00	402	0.38
Excavation for Chute Widening	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Training Walls and Chute Lining	Cranes	1	8.00	231	0.29
Training Walls and Chute Lining	Forklifts	0	8.00	89	0.20
Training Walls and Chute Lining	Generator Sets	0	8.00	84	0.74
Training Walls and Chute Lining	Off-Highway Trucks	1	4.00	402	0.38
Training Walls and Chute Lining	Off-Highway Trucks	1	8.00	402	0.38
Training Walls and Chute Lining	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Training Walls and Chute Lining	Welders	0	8.00	46	0.45
Labyrinth Weir	Cranes	1	2.00	231	0.29
Labyrinth Weir	Forklifts	0	8.00	89	0.20
Labyrinth Weir	Generator Sets	0	8.00	84	0.74
Labyrinth Weir	Off-Highway Tractors	1	4.00	124	0.44
Labyrinth Weir	Off-Highway Trucks	2	8.00	402	0.38
Labyrinth Weir	Off-Highway Trucks	1	4.00	402	0.38
Labyrinth Weir	Pavers	0	8.00	130	0.42
Labyrinth Weir	Plate Compactors	4	4.00	8	0.43
Labyrinth Weir	Rollers	0	8.00	80	0.38
Labyrinth Weir	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Labyrinth Weir	Welders	0	8.00	46	0.45
Bridge Pier and Abutment	Cranes	1	8.00	231	0.29

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Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Generator Sets	2	4.00	84	0.74
Demobilization/Reclamation	Pavers	1	8.00	130	0.42
Demobilization/Reclamation	Rollers	1	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	9	20.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Access Road Realignment	10	24.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Selective Site Demolition	9	28.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Excavation for Chute Widening	12	28.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Training Walls and Chute Linings	4	24.00	18.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Labyrinth Weir	14	24.00	53.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Bridge Pier and Abutment	7	20.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Access Bridge	8	20.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	20.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.2 Mobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.0859	19.4572	15.2117	0.0410								3,951.7918	3,951.7918	1.1801		3,981.2934
Total	2.0859	19.4572	15.2117	0.0410								3,951.7918	3,951.7918	1.1801		3,981.2934

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0698	2.1026	0.5820	7.9800e-003								857.7081	857.7081	0.0521		859.0103
Worker	0.1088	0.0686	0.8804	2.8200e-003								281.4355	281.4355	6.8000e-003		281.6056
Total	0.1786	2.1712	1.4623	0.0108								1,139.1436	1,139.1436	0.0589		1,140.6159

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3.2 Mobilization - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.0859	19.4572	15.2117	0.0410							0.0000	3,951.7917	3,951.7917	1.1801		3,981.2934
Total	2.0859	19.4572	15.2117	0.0410							0.0000	3,951.7917	3,951.7917	1.1801		3,981.2934

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0698	2.1026	0.5820	7.9800e-003								857.7081	857.7081	0.0521		859.0103
Worker	0.1088	0.0686	0.8804	2.8200e-003								281.4355	281.4355	6.8000e-003		281.6056
Total	0.1786	2.1712	1.4623	0.0108								1,139.1436	1,139.1436	0.0589		1,140.6159

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.3 Access Road Realignment - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1637	21.7400	18.3551	0.0400								3,849.7387	3,849.7387	1.1471		3,878.4153
Paving	0.2299												0.0000			0.0000
Total	2.3936	21.7400	18.3551	0.0400								3,849.7387	3,849.7387	1.1471		3,878.4153

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0698	2.1026	0.5820	7.9800e-003								857.7081	857.7081	0.0521		859.0103
Worker	0.1305	0.0823	1.0564	3.3900e-003								337.7226	337.7226	8.1600e-003		337.9267
Total	0.2004	2.1849	1.6384	0.0114								1,195.4307	1,195.4307	0.0603		1,196.9370

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.3 Access Road Realignment - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1637	21.7400	18.3551	0.0400							0.0000	3,849.7387	3,849.7387	1.1471		3,878.4153
Paving	0.2299												0.0000			0.0000
Total	2.3936	21.7400	18.3551	0.0400							0.0000	3,849.7387	3,849.7387	1.1471		3,878.4153

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0698	2.1026	0.5820	7.9800e-003								857.7081	857.7081	0.0521		859.0103
Worker	0.1305	0.0823	1.0564	3.3900e-003								337.7226	337.7226	8.1600e-003		337.9267
Total	0.2004	2.1849	1.6384	0.0114								1,195.4307	1,195.4307	0.0603		1,196.9370

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.3 Access Road Realignment - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9362	18.4825	17.9660	0.0400								3,850.1887	3,850.1887	1.1461		3,878.8415
Paving	0.2299												0.0000			0.0000
Total	2.1660	18.4825	17.9660	0.0400								3,850.1887	3,850.1887	1.1461		3,878.8415

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0651	1.9304	0.5581	7.8900e-003								849.4984	849.4984	0.0510		850.7735
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.1881	2.0048	1.5374	0.0112								1,174.7898	1,174.7898	0.0584		1,176.2497

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.3 Access Road Realignment - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9362	18.4825	17.9660	0.0400							0.0000	3,850.1887	3,850.1887	1.1461		3,878.8415
Paving	0.2299												0.0000			0.0000
Total	2.1660	18.4825	17.9660	0.0400							0.0000	3,850.1887	3,850.1887	1.1461		3,878.8415

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0651	1.9304	0.5581	7.8900e-003								849.4984	849.4984	0.0510		850.7735
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.1881	2.0048	1.5374	0.0112								1,174.7898	1,174.7898	0.0584		1,176.2497

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.4 Selective Site Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3110	20.0460	20.0976	0.0503								4,841.1900	4,841.1900	1.5394		4,879.6751
Total	2.3110	20.0460	20.0976	0.0503								4,841.1900	4,841.1900	1.5394		4,879.6751

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0651	1.9304	0.5581	7.8900e-003								849.4984	849.4984	0.0510		850.7735
Worker	0.1435	0.0868	1.1425	3.8100e-003								379.5067	379.5067	8.6200e-003		379.7222
Total	0.2086	2.0172	1.7006	0.0117								1,229.0051	1,229.0051	0.0596		1,230.4957

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.4 Selective Site Demolition - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3110	20.0460	20.0976	0.0503							0.0000	4,841.1900	4,841.1900	1.5394		4,879.6751
Total	2.3110	20.0460	20.0976	0.0503							0.0000	4,841.1900	4,841.1900	1.5394		4,879.6751

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0651	1.9304	0.5581	7.8900e-003								849.4984	849.4984	0.0510		850.7735
Worker	0.1435	0.0868	1.1425	3.8100e-003								379.5067	379.5067	8.6200e-003		379.7222
Total	0.2086	2.0172	1.7006	0.0117								1,229.0051	1,229.0051	0.0596		1,230.4957

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.5 Excavation for Chute Widening - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8622	16.0378	18.4689	0.0391								3,735.9877	3,735.9877	1.1556		3,764.8783
Total	1.8622	16.0378	18.4689	0.0391								3,735.9877	3,735.9877	1.1556		3,764.8783

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0451	1.3364	0.3864	5.4600e-003								588.1142	588.1142	0.0353		588.9971
Worker	0.1435	0.0868	1.1425	3.8100e-003								379.5067	379.5067	8.6200e-003		379.7222
Total	0.1886	1.4232	1.5289	9.2700e-003								967.6210	967.6210	0.0439		968.7193

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.5 Excavation for Chute Widening - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8622	16.0378	18.4689	0.0391							0.0000	3,735.9877	3,735.9877	1.1556		3,764.8783
Total	1.8622	16.0378	18.4689	0.0391							0.0000	3,735.9877	3,735.9877	1.1556		3,764.8783

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0451	1.3364	0.3864	5.4600e-003								588.1142	588.1142	0.0353		588.9971
Worker	0.1435	0.0868	1.1425	3.8100e-003								379.5067	379.5067	8.6200e-003		379.7222
Total	0.1886	1.4232	1.5289	9.2700e-003								967.6210	967.6210	0.0439		968.7193

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.6 Training Walls and Chute Lining - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3303	11.8805	9.1684	0.0287								2,778.5472	2,778.5472	0.8986		2,801.0132
Total	1.3303	11.8805	9.1684	0.0287								2,778.5472	2,778.5472	0.8986		2,801.0132

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0901	2.6729	0.7727	0.0109								1,176.2285	1,176.2285	0.0706		1,177.9941
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.2131	2.7473	1.7520	0.0142								1,501.5200	1,501.5200	0.0780		1,503.4703

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.6 Training Walls and Chute Lining - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3303	11.8805	9.1684	0.0287							0.0000	2,778.5472	2,778.5472	0.8986		2,801.0132
Total	1.3303	11.8805	9.1684	0.0287							0.0000	2,778.5472	2,778.5472	0.8986		2,801.0132

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0901	2.6729	0.7727	0.0109								1,176.2285	1,176.2285	0.0706		1,177.9941
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.2131	2.7473	1.7520	0.0142								1,501.5200	1,501.5200	0.0780		1,503.4703

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.6 Training Walls and Chute Lining - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2586	10.7031	8.9985	0.0287								2,780.2285	2,780.2285	0.8992		2,802.7080
Total	1.2586	10.7031	8.9985	0.0287								2,780.2285	2,780.2285	0.8992		2,802.7080

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0660	1.8118	0.7081	0.0107								1,149.7400	1,149.7400	0.0663		1,151.3986
Worker	0.1160	0.0673	0.9062	3.1400e-003								312.8145	312.8145	6.6700e-003		312.9812
Total	0.1820	1.8790	1.6142	0.0138								1,462.5545	1,462.5545	0.0730		1,464.3798

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.6 Training Walls and Chute Lining - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2586	10.7031	8.9985	0.0287							0.0000	2,780.2285	2,780.2285	0.8992		2,802.7080
Total	1.2586	10.7031	8.9985	0.0287							0.0000	2,780.2285	2,780.2285	0.8992		2,802.7080

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0660	1.8118	0.7081	0.0107								1,149.7400	1,149.7400	0.0663		1,151.3986
Worker	0.1160	0.0673	0.9062	3.1400e-003								312.8145	312.8145	6.6700e-003		312.9812
Total	0.1820	1.8790	1.6142	0.0138								1,462.5545	1,462.5545	0.0730		1,464.3798

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.7 Labyrinth Weir - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9352	16.0114	15.2996	0.0440								4,236.0944	4,236.0944	1.3549		4,269.9667
Total	1.9352	16.0114	15.2996	0.0440								4,236.0944	4,236.0944	1.3549		4,269.9667

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2654	7.8701	2.2753	0.0322								3,463.3394	3,463.3394	0.2080		3,468.5382
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.3884	7.9445	3.2546	0.0354								3,788.6309	3,788.6309	0.2153		3,794.0144

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.7 Labyrinth Weir - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9352	16.0114	15.2996	0.0440							0.0000	4,236.0944	4,236.0944	1.3549		4,269.9667
Total	1.9352	16.0114	15.2996	0.0440							0.0000	4,236.0944	4,236.0944	1.3549		4,269.9667

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2654	7.8701	2.2753	0.0322								3,463.3394	3,463.3394	0.2080		3,468.5382
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.3884	7.9445	3.2546	0.0354								3,788.6309	3,788.6309	0.2153		3,794.0144

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.7 Labyrinth Weir - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8272	14.3063	15.0758	0.0441								4,239.1137	4,239.1137	1.3559		4,273.0105
Total	1.8272	14.3063	15.0758	0.0441								4,239.1137	4,239.1137	1.3559		4,273.0105

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1943	5.3347	2.0848	0.0314								3,385.3456	3,385.3456	0.1953		3,390.2292
Worker	0.1160	0.0673	0.9062	3.1400e-003								312.8145	312.8145	6.6700e-003		312.9812
Total	0.3103	5.4019	2.9910	0.0345								3,698.1600	3,698.1600	0.2020		3,703.2103

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.7 Labyrinth Weir - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8272	14.3063	15.0758	0.0441							0.0000	4,239.1137	4,239.1137	1.3559		4,273.0105
Total	1.8272	14.3063	15.0758	0.0441							0.0000	4,239.1137	4,239.1137	1.3559		4,273.0105

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1943	5.3347	2.0848	0.0314								3,385.3456	3,385.3456	0.1953		3,390.2292
Worker	0.1160	0.0673	0.9062	3.1400e-003								312.8145	312.8145	6.6700e-003		312.9812
Total	0.3103	5.4019	2.9910	0.0345								3,698.1600	3,698.1600	0.2020		3,703.2103

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.8 Bridge Pier and Abutment - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1081	17.7639	17.0224	0.0493								4,769.4420	4,769.4420	1.5425		4,808.0054
Total	2.1081	17.7639	17.0224	0.0493								4,769.4420	4,769.4420	1.5425		4,808.0054

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0477	1.3085	0.5114	7.7000e-003								830.3678	830.3678	0.0479		831.5656
Worker	0.0966	0.0560	0.7551	2.6100e-003								260.6787	260.6787	5.5600e-003		260.8176
Total	0.1443	1.3645	1.2665	0.0103								1,091.0465	1,091.0465	0.0535		1,092.3833

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.8 Bridge Pier and Abutment - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1081	17.7639	17.0224	0.0493							0.0000	4,769.4420	4,769.4420	1.5425		4,808.0054
Total	2.1081	17.7639	17.0224	0.0493							0.0000	4,769.4420	4,769.4420	1.5425		4,808.0054

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0477	1.3085	0.5114	7.7000e-003								830.3678	830.3678	0.0479		831.5656
Worker	0.0966	0.0560	0.7551	2.6100e-003								260.6787	260.6787	5.5600e-003		260.8176
Total	0.1443	1.3645	1.2665	0.0103								1,091.0465	1,091.0465	0.0535		1,092.3833

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.9 Access Bridge - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2968	19.3125	20.2801	0.0544								5,269.5476	5,269.5476	1.7043		5,312.1546
Total	2.2968	19.3125	20.2801	0.0544								5,269.5476	5,269.5476	1.7043		5,312.1546

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0477	1.3085	0.5114	7.7000e-003								830.3678	830.3678	0.0479		831.5656
Worker	0.0966	0.0560	0.7551	2.6100e-003								260.6787	260.6787	5.5600e-003		260.8176
Total	0.1443	1.3645	1.2665	0.0103								1,091.0465	1,091.0465	0.0535		1,092.3833

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.9 Access Bridge - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2968	19.3125	20.2801	0.0544							0.0000	5,269.5476	5,269.5476	1.7043		5,312.1546
Total	2.2968	19.3125	20.2801	0.0544							0.0000	5,269.5476	5,269.5476	1.7043		5,312.1546

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0477	1.3085	0.5114	7.7000e-003								830.3678	830.3678	0.0479		831.5656
Worker	0.0966	0.0560	0.7551	2.6100e-003								260.6787	260.6787	5.5600e-003		260.8176
Total	0.1443	1.3645	1.2665	0.0103								1,091.0465	1,091.0465	0.0535		1,092.3833

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.10 Demobilization/Reclamation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.0314	16.8392	19.6402	0.0473								4,548.0344	4,548.0344	1.2837		4,580.1260
Total	2.0314	16.8392	19.6402	0.0473								4,548.0344	4,548.0344	1.2837		4,580.1260

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0330	0.9059	0.3540	5.3300e-003								574.8700	574.8700	0.0332		575.6993
Worker	0.0966	0.0560	0.7551	2.6100e-003								260.6787	260.6787	5.5600e-003		260.8176
Total	0.1296	0.9619	1.1092	7.9400e-003								835.5487	835.5487	0.0387		836.5169

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

3.10 Demobilization/Reclamation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.0314	16.8392	19.6402	0.0473							0.0000	4,548.0344	4,548.0344	1.2837		4,580.1260
Total	2.0314	16.8392	19.6402	0.0473							0.0000	4,548.0344	4,548.0344	1.2837		4,580.1260

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0330	0.9059	0.3540	5.3300e-003								574.8700	574.8700	0.0332		575.6993
Worker	0.0966	0.0560	0.7551	2.6100e-003								260.6787	260.6787	5.5600e-003		260.8176
Total	0.1296	0.9619	1.1092	7.9400e-003								835.5487	835.5487	0.0387		836.5169

4.0 Operational Detail - Mobile

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.593330	0.040945	0.188012	0.107577	0.017981	0.006204	0.019981	0.018142	0.001176	0.001026	0.003857	0.000384	0.001386

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0068	1.0000e-005	5.9000e-004	0.0000								1.2700e-003	1.2700e-003	0.0000		1.3500e-003
Unmitigated	1.0068	1.0000e-005	5.9000e-004	0.0000								1.2700e-003	1.2700e-003	0.0000		1.3500e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.9174												0.0000			0.0000
Consumer Products	0.0893												0.0000			0.0000
Landscaping	5.0000e-005	1.0000e-005	5.9000e-004	0.0000								1.2700e-003	1.2700e-003	0.0000		1.3500e-003
Total	1.0068	1.0000e-005	5.9000e-004	0.0000								1.2700e-003	1.2700e-003	0.0000		1.3500e-003

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.9174												0.0000			0.0000
Consumer Products	0.0893												0.0000			0.0000
Landscaping	5.0000e-005	1.0000e-005	5.9000e-004	0.0000								1.2700e-003	1.2700e-003	0.0000		1.3500e-003
Total	1.0068	1.0000e-005	5.9000e-004	0.0000								1.2700e-003	1.2700e-003	0.0000		1.3500e-003

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Summer

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

Boilers

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

User Defined Equipment

Equipment Type	Number
----------------	--------

11.0 Vegetation

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

Santa Felicia Dam Spillway Imp Alt 2A
Ventura County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	5.79	Acre	5.79	252,212.40	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

Project Characteristics - Start of construction based on the schedule provided in the Constructability Analysis report.

Land Use - Acreage based on Constructability Analysis figures.

Construction Phase - Schedule based on Constructability Analysis, Table 3-1.

Off-road Equipment - Concrete Pump Truck, Water Truck, and Flatbed= Off-highway Truck.

Off-road Equipment - Flatbed, concrete pump truck, and water truck = Off-highway truck

Off-road Equipment - Water Truck= Off-highway truck, Compactor - off-highway tractor.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Water truck= off-highway truck

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Equipment info based on Constructability Analysis, Table 2. Chipper = generator set. Water truck, flatbed truck = off-highway truck.

Off-road Equipment - flatbed and water truck = off-highway truck.

Off-road Equipment - Water truck and concrete pump truck = off-highway truck

Trips and VMT - Trip count taken from Constructability Analysis report. It is assumed that workers and vendors will be coming from the cities of Castaic and Santa Clarita, roughly 20 miles to the east.

Grading -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Area Coating -

Energy Use -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	0	72092
tblAreaCoating	Area_Nonresidential_Interior	0	216276
tblAreaCoating	Area_Parking	15133	601
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Pavers
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Access Road Realignment
tblOffRoadEquipment	PhaseName		Mobilization
tblOffRoadEquipment	PhaseName		Access Road Realignment
tblOffRoadEquipment	PhaseName		Mobilization
tblOffRoadEquipment	PhaseName		Access Road Realignment
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	PhaseName		Mobilization
tblOffRoadEquipment	PhaseName		Access Road Realignment
tblOffRoadEquipment	PhaseName		Access Bridge
tblOffRoadEquipment	PhaseName		Mobilization
tblOffRoadEquipment	PhaseName		Access Road Realignment
tblOffRoadEquipment	PhaseName		Mobilization
tblOffRoadEquipment	PhaseName		Access Road Realignment
tblOffRoadEquipment	PhaseName		Access Road Realignment
tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Mobilization
tblOffRoadEquipment	PhaseName		Access Road Realignment

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tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Bridge Pier and Abutment
tblOffRoadEquipment	PhaseName		Bridge Pier and Abutment
tblOffRoadEquipment	PhaseName		Access Bridge
tblOffRoadEquipment	PhaseName		Access Bridge
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Bridge Pier and Abutment
tblOffRoadEquipment	PhaseName		Access Bridge
tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Bridge Pier and Abutment
tblOffRoadEquipment	PhaseName		Access Bridge
tblOffRoadEquipment	PhaseName		Access Road Realignment
tblOffRoadEquipment	PhaseName		Access Road Realignment
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	2.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00

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tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblProjectCharacteristics	OperationalYear	2018	2023
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripNumber	0.00	13.00
tblTripsAndVMT	VendorTripNumber	0.00	13.00
tblTripsAndVMT	VendorTripNumber	0.00	13.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	41.00	18.00
tblTripsAndVMT	VendorTripNumber	41.00	53.00
tblTripsAndVMT	VendorTripNumber	41.00	13.00
tblTripsAndVMT	VendorTripNumber	41.00	13.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00

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tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripNumber	23.00	20.00
tblTripsAndVMT	WorkerTripNumber	25.00	24.00
tblTripsAndVMT	WorkerTripNumber	23.00	28.00
tblTripsAndVMT	WorkerTripNumber	30.00	28.00
tblTripsAndVMT	WorkerTripNumber	106.00	24.00
tblTripsAndVMT	WorkerTripNumber	106.00	24.00
tblTripsAndVMT	WorkerTripNumber	106.00	20.00
tblTripsAndVMT	WorkerTripNumber	106.00	20.00
tblTripsAndVMT	WorkerTripNumber	10.00	20.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00

2.0 Emissions Summary

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.6203	23.9706	19.9755	0.0516							0.0000	5,068.3852	5,068.3852	1.2403	0.0000	5,099.3934
2022	4.6274	39.5989	41.7316	0.1216							0.0000	12,225.0521	12,225.0521	2.8004	0.0000	12,288.9240
2023	5.9057	51.5248	46.9997	0.1797							0.0000	17,941.4299	17,941.4299	4.1332	0.0000	18,044.7592
Maximum	5.9057	51.5248	46.9997	0.1797							0.0000	17,941.4299	17,941.4299	4.1332	0.0000	18,044.7592

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.6203	23.9706	19.9755	0.0516							0.0000	5,068.3852	5,068.3852	1.2403	0.0000	5,099.3934
2022	4.6274	39.5989	41.7316	0.1216							0.0000	12,225.0521	12,225.0521	2.8004	0.0000	12,288.9240
2023	5.9057	51.5248	46.9997	0.1797							0.0000	17,941.4299	17,941.4299	4.1332	0.0000	18,044.7592
Maximum	5.9057	51.5248	46.9997	0.1797							0.0000	17,941.4299	17,941.4299	4.1332	0.0000	18,044.7592

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0068	1.0000e-005	5.9000e-004	0.0000								1.2700e-003	1.2700e-003	0.0000		1.3500e-003
Energy	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Total	1.0068	1.0000e-005	5.9000e-004	0.0000								1.2700e-003	1.2700e-003	0.0000	0.0000	1.3500e-003

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0068	1.0000e-005	5.9000e-004	0.0000								1.2700e-003	1.2700e-003	0.0000		1.3500e-003
Energy	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Total	1.0068	1.0000e-005	5.9000e-004	0.0000								1.2700e-003	1.2700e-003	0.0000	0.0000	1.3500e-003

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Site Preparation	10/1/2021	10/31/2021	5	21	
2	Access Road Realignment	Paving	11/1/2021	1/31/2022	5	66	
3	Selective Site Demolition	Demolition	2/1/2022	5/31/2022	5	86	
4	Excavation for Chute Widening	Trenching	3/1/2022	8/31/2022	5	132	
5	Training Walls and Chute Lining	Building Construction	9/1/2022	4/30/2023	5	172	
6	Labyrinth Weir	Building Construction	9/1/2022	4/30/2023	5	172	
7	Bridge Pier and Abutment	Building Construction	1/2/2023	4/30/2023	5	85	
8	Access Bridge	Building Construction	5/1/2023	8/31/2023	5	89	
9	Demobilization/Reclamation	Site Preparation	9/1/2023	9/30/2023	5	21	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 5.79

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Concrete/Industrial Saws	0	8.00	81	0.73

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Mobilization	Dumpers/Tenders	1	8.00	16	0.38
Mobilization	Excavators	1	4.00	158	0.38
Mobilization	Generator Sets	1	4.00	84	0.74
Mobilization	Graders	1	4.00	187	0.41
Mobilization	Off-Highway Trucks	2	8.00	402	0.38
Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Mobilization	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Access Road Realignment	Cement and Mortar Mixers	0	6.00	9	0.56
Access Road Realignment	Concrete/Industrial Saws	0		81	0.73
Access Road Realignment	Dumpers/Tenders	1	8.00	16	0.38
Access Road Realignment	Excavators	1	8.00	158	0.38
Access Road Realignment	Generator Sets	1	4.00	84	0.74
Access Road Realignment	Graders	1	8.00	187	0.41
Access Road Realignment	Off-Highway Tractors	2	4.00	124	0.44
Access Road Realignment	Off-Highway Trucks	1	8.00	402	0.38
Access Road Realignment	Pavers	0	8.00	130	0.42
Access Road Realignment	Paving Equipment	0	6.00	132	0.36
Access Road Realignment	Rollers	0	6.00	80	0.38
Access Road Realignment	Tractors/Loaders/Backhoes	2	4.00	97	0.37
Access Road Realignment	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Selective Site Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Selective Site Demolition	Cranes	1	8.00	231	0.29
Selective Site Demolition	Dumpers/Tenders	2	8.00	16	0.38
Selective Site Demolition	Excavators	2	8.00	158	0.38
Selective Site Demolition	Off-Highway Trucks	2	8.00	402	0.38
Selective Site Demolition	Rubber Tired Dozers	0	8.00	247	0.40

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Selective Site Demolition	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Excavation for Chute Widening	Aerial Lifts	1	4.00	63	0.31
Excavation for Chute Widening	Cranes	1	4.00	231	0.29
Excavation for Chute Widening	Dumpers/Tenders	4	8.00	16	0.38
Excavation for Chute Widening	Excavators	1	4.00	158	0.38
Excavation for Chute Widening	Excavators	2	8.00	158	0.38
Excavation for Chute Widening	Off-Highway Trucks	1	8.00	402	0.38
Excavation for Chute Widening	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Training Walls and Chute Lining	Cranes	1	8.00	231	0.29
Training Walls and Chute Lining	Forklifts	0	8.00	89	0.20
Training Walls and Chute Lining	Generator Sets	0	8.00	84	0.74
Training Walls and Chute Lining	Off-Highway Trucks	1	4.00	402	0.38
Training Walls and Chute Lining	Off-Highway Trucks	1	8.00	402	0.38
Training Walls and Chute Lining	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Training Walls and Chute Lining	Welders	0	8.00	46	0.45
Labyrinth Weir	Cranes	1	2.00	231	0.29
Labyrinth Weir	Forklifts	0	8.00	89	0.20
Labyrinth Weir	Generator Sets	0	8.00	84	0.74
Labyrinth Weir	Off-Highway Tractors	1	4.00	124	0.44
Labyrinth Weir	Off-Highway Trucks	2	8.00	402	0.38
Labyrinth Weir	Off-Highway Trucks	1	4.00	402	0.38
Labyrinth Weir	Pavers	0	8.00	130	0.42
Labyrinth Weir	Plate Compactors	4	4.00	8	0.43
Labyrinth Weir	Rollers	0	8.00	80	0.38
Labyrinth Weir	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Labyrinth Weir	Welders	0	8.00	46	0.45
Bridge Pier and Abutment	Cranes	1	8.00	231	0.29

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Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Generator Sets	2	4.00	84	0.74
Demobilization/Reclamation	Pavers	1	8.00	130	0.42
Demobilization/Reclamation	Rollers	1	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	9	20.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Access Road Realignment	10	24.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Selective Site Demolition	9	28.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Excavation for Chute Widening	12	28.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Training Walls and Chute Linings	4	24.00	18.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Labyrinth Weir	14	24.00	53.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Bridge Pier and Abutment	7	20.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Access Bridge	8	20.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	20.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

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3.2 Mobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.0859	19.4572	15.2117	0.0410								3,951.7918	3,951.7918	1.1801		3,981.2934
Total	2.0859	19.4572	15.2117	0.0410								3,951.7918	3,951.7918	1.1801		3,981.2934

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0727	2.1342	0.6199	7.9000e-003								848.9172	848.9172	0.0538		850.2622
Worker	0.1284	0.0804	0.8338	2.6900e-003								267.6762	267.6762	6.4600e-003		267.8378
Total	0.2011	2.2146	1.4537	0.0106								1,116.5934	1,116.5934	0.0603		1,118.1000

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3.2 Mobilization - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.0859	19.4572	15.2117	0.0410							0.0000	3,951.7917	3,951.7917	1.1801		3,981.2934
Total	2.0859	19.4572	15.2117	0.0410							0.0000	3,951.7917	3,951.7917	1.1801		3,981.2934

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0727	2.1342	0.6199	7.9000e-003								848.9172	848.9172	0.0538		850.2622
Worker	0.1284	0.0804	0.8338	2.6900e-003								267.6762	267.6762	6.4600e-003		267.8378
Total	0.2011	2.2146	1.4537	0.0106								1,116.5934	1,116.5934	0.0603		1,118.1000

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3.3 Access Road Realignment - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1637	21.7400	18.3551	0.0400								3,849.7387	3,849.7387	1.1471		3,878.4153
Paving	0.2299												0.0000			0.0000
Total	2.3936	21.7400	18.3551	0.0400								3,849.7387	3,849.7387	1.1471		3,878.4153

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0727	2.1342	0.6199	7.9000e-003								848.9172	848.9172	0.0538		850.2622
Worker	0.1540	0.0965	1.0006	3.2200e-003								321.2114	321.2114	7.7600e-003		321.4054
Total	0.2268	2.2307	1.6204	0.0111								1,170.1287	1,170.1287	0.0616		1,171.6676

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3.3 Access Road Realignment - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1637	21.7400	18.3551	0.0400							0.0000	3,849.7387	3,849.7387	1.1471		3,878.4153
Paving	0.2299												0.0000			0.0000
Total	2.3936	21.7400	18.3551	0.0400							0.0000	3,849.7387	3,849.7387	1.1471		3,878.4153

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0727	2.1342	0.6199	7.9000e-003								848.9172	848.9172	0.0538		850.2622
Worker	0.1540	0.0965	1.0006	3.2200e-003								321.2114	321.2114	7.7600e-003		321.4054
Total	0.2268	2.2307	1.6204	0.0111								1,170.1287	1,170.1287	0.0616		1,171.6676

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

3.3 Access Road Realignment - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9362	18.4825	17.9660	0.0400								3,850.1887	3,850.1887	1.1461		3,878.8415
Paving	0.2299												0.0000			0.0000
Total	2.1660	18.4825	17.9660	0.0400								3,850.1887	3,850.1887	1.1461		3,878.8415

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0678	1.9569	0.5940	7.8100e-003								840.7187	840.7187	0.0526		842.0339
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.2133	2.0441	1.5197	0.0109								1,150.1152	1,150.1152	0.0596		1,151.6056

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

3.3 Access Road Realignment - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9362	18.4825	17.9660	0.0400							0.0000	3,850.1887	3,850.1887	1.1461		3,878.8415
Paving	0.2299												0.0000			0.0000
Total	2.1660	18.4825	17.9660	0.0400							0.0000	3,850.1887	3,850.1887	1.1461		3,878.8415

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0678	1.9569	0.5940	7.8100e-003								840.7187	840.7187	0.0526		842.0339
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.2133	2.0441	1.5197	0.0109								1,150.1152	1,150.1152	0.0596		1,151.6056

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

3.4 Selective Site Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3110	20.0460	20.0976	0.0503								4,841.1900	4,841.1900	1.5394		4,879.6751
Total	2.3110	20.0460	20.0976	0.0503								4,841.1900	4,841.1900	1.5394		4,879.6751

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0678	1.9569	0.5940	7.8100e-003								840.7187	840.7187	0.0526		842.0339
Worker	0.1697	0.1017	1.0799	3.6200e-003								360.9626	360.9626	8.1800e-003		361.1670
Total	0.2376	2.0586	1.6739	0.0114								1,201.6813	1,201.6813	0.0608		1,203.2009

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

3.4 Selective Site Demolition - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3110	20.0460	20.0976	0.0503							0.0000	4,841.1900	4,841.1900	1.5394		4,879.6751
Total	2.3110	20.0460	20.0976	0.0503							0.0000	4,841.1900	4,841.1900	1.5394		4,879.6751

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0678	1.9569	0.5940	7.8100e-003								840.7187	840.7187	0.0526		842.0339
Worker	0.1697	0.1017	1.0799	3.6200e-003								360.9626	360.9626	8.1800e-003		361.1670
Total	0.2376	2.0586	1.6739	0.0114								1,201.6813	1,201.6813	0.0608		1,203.2009

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

3.5 Excavation for Chute Widening - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8622	16.0378	18.4689	0.0391								3,735.9877	3,735.9877	1.1556		3,764.8783
Total	1.8622	16.0378	18.4689	0.0391								3,735.9877	3,735.9877	1.1556		3,764.8783

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0470	1.3548	0.4113	5.4100e-003								582.0360	582.0360	0.0364		582.9466
Worker	0.1697	0.1017	1.0799	3.6200e-003								360.9626	360.9626	8.1800e-003		361.1670
Total	0.2167	1.4565	1.4912	9.0300e-003								942.9986	942.9986	0.0446		944.1136

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

3.5 Excavation for Chute Widening - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8622	16.0378	18.4689	0.0391							0.0000	3,735.9877	3,735.9877	1.1556		3,764.8783
Total	1.8622	16.0378	18.4689	0.0391							0.0000	3,735.9877	3,735.9877	1.1556		3,764.8783

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0470	1.3548	0.4113	5.4100e-003								582.0360	582.0360	0.0364		582.9466
Worker	0.1697	0.1017	1.0799	3.6200e-003								360.9626	360.9626	8.1800e-003		361.1670
Total	0.2167	1.4565	1.4912	9.0300e-003								942.9986	942.9986	0.0446		944.1136

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

3.6 Training Walls and Chute Lining - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3303	11.8805	9.1684	0.0287								2,778.5472	2,778.5472	0.8986		2,801.0132
Total	1.3303	11.8805	9.1684	0.0287								2,778.5472	2,778.5472	0.8986		2,801.0132

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0939	2.7095	0.8225	0.0108								1,164.0721	1,164.0721	0.0728		1,165.8931
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.2394	2.7967	1.7481	0.0139								1,473.4685	1,473.4685	0.0799		1,475.4648

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

3.6 Training Walls and Chute Lining - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3303	11.8805	9.1684	0.0287							0.0000	2,778.5472	2,778.5472	0.8986		2,801.0132
Total	1.3303	11.8805	9.1684	0.0287							0.0000	2,778.5472	2,778.5472	0.8986		2,801.0132

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0939	2.7095	0.8225	0.0108								1,164.0721	1,164.0721	0.0728		1,165.8931
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.2394	2.7967	1.7481	0.0139								1,473.4685	1,473.4685	0.0799		1,475.4648

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

3.6 Training Walls and Chute Lining - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2586	10.7031	8.9985	0.0287								2,780.2285	2,780.2285	0.8992		2,802.7080
Total	1.2586	10.7031	8.9985	0.0287								2,780.2285	2,780.2285	0.8992		2,802.7080

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0690	1.8275	0.7461	0.0106								1,137.7767	1,137.7767	0.0681		1,139.4787
Worker	0.1376	0.0788	0.8545	2.9800e-003								297.5369	297.5369	6.3100e-003		297.6947
Total	0.2066	1.9063	1.6007	0.0135								1,435.3136	1,435.3136	0.0744		1,437.1733

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

3.6 Training Walls and Chute Lining - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2586	10.7031	8.9985	0.0287							0.0000	2,780.2285	2,780.2285	0.8992		2,802.7080
Total	1.2586	10.7031	8.9985	0.0287							0.0000	2,780.2285	2,780.2285	0.8992		2,802.7080

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0690	1.8275	0.7461	0.0106								1,137.7767	1,137.7767	0.0681		1,139.4787
Worker	0.1376	0.0788	0.8545	2.9800e-003								297.5369	297.5369	6.3100e-003		297.6947
Total	0.2066	1.9063	1.6007	0.0135								1,435.3136	1,435.3136	0.0744		1,437.1733

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

3.7 Labyrinth Weir - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9352	16.0114	15.2996	0.0440								4,236.0944	4,236.0944	1.3549		4,269.9667
Total	1.9352	16.0114	15.2996	0.0440								4,236.0944	4,236.0944	1.3549		4,269.9667

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2765	7.9781	2.4218	0.0318								3,427.5455	3,427.5455	0.2145		3,432.9075
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.4220	8.0653	3.3474	0.0349								3,736.9420	3,736.9420	0.2215		3,742.4792

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

3.7 Labyrinth Weir - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9352	16.0114	15.2996	0.0440							0.0000	4,236.0944	4,236.0944	1.3549		4,269.9667
Total	1.9352	16.0114	15.2996	0.0440							0.0000	4,236.0944	4,236.0944	1.3549		4,269.9667

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2765	7.9781	2.4218	0.0318								3,427.5455	3,427.5455	0.2145		3,432.9075
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.4220	8.0653	3.3474	0.0349								3,736.9420	3,736.9420	0.2215		3,742.4792

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

3.7 Labyrinth Weir - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8272	14.3063	15.0758	0.0441								4,239.1137	4,239.1137	1.3559		4,273.0105
Total	1.8272	14.3063	15.0758	0.0441								4,239.1137	4,239.1137	1.3559		4,273.0105

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2032	5.3810	2.1969	0.0311								3,350.1202	3,350.1202	0.2005		3,355.1316
Worker	0.1376	0.0788	0.8545	2.9800e-003								297.5369	297.5369	6.3100e-003		297.6947
Total	0.3408	5.4598	3.0515	0.0340								3,647.6571	3,647.6571	0.2068		3,652.8263

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

3.7 Labyrinth Weir - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.8272	14.3063	15.0758	0.0441							0.0000	4,239.1137	4,239.1137	1.3559		4,273.0105
Total	1.8272	14.3063	15.0758	0.0441							0.0000	4,239.1137	4,239.1137	1.3559		4,273.0105

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2032	5.3810	2.1969	0.0311								3,350.1202	3,350.1202	0.2005		3,355.1316
Worker	0.1376	0.0788	0.8545	2.9800e-003								297.5369	297.5369	6.3100e-003		297.6947
Total	0.3408	5.4598	3.0515	0.0340								3,647.6571	3,647.6571	0.2068		3,652.8263

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

3.8 Bridge Pier and Abutment - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1081	17.7639	17.0224	0.0493								4,769.4420	4,769.4420	1.5425		4,808.0054
Total	2.1081	17.7639	17.0224	0.0493								4,769.4420	4,769.4420	1.5425		4,808.0054

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0498	1.3199	0.5389	7.6200e-003								821.7276	821.7276	0.0492		822.9568
Worker	0.1147	0.0657	0.7121	2.4900e-003								247.9474	247.9474	5.2600e-003		248.0789
Total	0.1645	1.3855	1.2510	0.0101								1,069.6750	1,069.6750	0.0544		1,071.0357

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

3.8 Bridge Pier and Abutment - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1081	17.7639	17.0224	0.0493							0.0000	4,769.4420	4,769.4420	1.5425		4,808.0054
Total	2.1081	17.7639	17.0224	0.0493							0.0000	4,769.4420	4,769.4420	1.5425		4,808.0054

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0498	1.3199	0.5389	7.6200e-003								821.7276	821.7276	0.0492		822.9568
Worker	0.1147	0.0657	0.7121	2.4900e-003								247.9474	247.9474	5.2600e-003		248.0789
Total	0.1645	1.3855	1.2510	0.0101								1,069.6750	1,069.6750	0.0544		1,071.0357

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

3.9 Access Bridge - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2968	19.3125	20.2801	0.0544								5,269.5476	5,269.5476	1.7043		5,312.1546
Total	2.2968	19.3125	20.2801	0.0544								5,269.5476	5,269.5476	1.7043		5,312.1546

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0498	1.3199	0.5389	7.6200e-003								821.7276	821.7276	0.0492		822.9568
Worker	0.1147	0.0657	0.7121	2.4900e-003								247.9474	247.9474	5.2600e-003		248.0789
Total	0.1645	1.3855	1.2510	0.0101								1,069.6750	1,069.6750	0.0544		1,071.0357

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

3.9 Access Bridge - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2968	19.3125	20.2801	0.0544							0.0000	5,269.5476	5,269.5476	1.7043		5,312.1546
Total	2.2968	19.3125	20.2801	0.0544							0.0000	5,269.5476	5,269.5476	1.7043		5,312.1546

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0498	1.3199	0.5389	7.6200e-003								821.7276	821.7276	0.0492		822.9568
Worker	0.1147	0.0657	0.7121	2.4900e-003								247.9474	247.9474	5.2600e-003		248.0789
Total	0.1645	1.3855	1.2510	0.0101								1,069.6750	1,069.6750	0.0544		1,071.0357

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

3.10 Demobilization/Reclamation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.0314	16.8392	19.6402	0.0473								4,548.0344	4,548.0344	1.2837		4,580.1260
Total	2.0314	16.8392	19.6402	0.0473								4,548.0344	4,548.0344	1.2837		4,580.1260

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0345	0.9138	0.3731	5.2700e-003								568.8883	568.8883	0.0340		569.7393
Worker	0.1147	0.0657	0.7121	2.4900e-003								247.9474	247.9474	5.2600e-003		248.0789
Total	0.1492	0.9794	1.0852	7.7600e-003								816.8357	816.8357	0.0393		817.8182

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

3.10 Demobilization/Reclamation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.0314	16.8392	19.6402	0.0473							0.0000	4,548.0344	4,548.0344	1.2837		4,580.1260
Total	2.0314	16.8392	19.6402	0.0473							0.0000	4,548.0344	4,548.0344	1.2837		4,580.1260

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0345	0.9138	0.3731	5.2700e-003								568.8883	568.8883	0.0340		569.7393
Worker	0.1147	0.0657	0.7121	2.4900e-003								247.9474	247.9474	5.2600e-003		248.0789
Total	0.1492	0.9794	1.0852	7.7600e-003								816.8357	816.8357	0.0393		817.8182

4.0 Operational Detail - Mobile

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.593330	0.040945	0.188012	0.107577	0.017981	0.006204	0.019981	0.018142	0.001176	0.001026	0.003857	0.000384	0.001386

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0068	1.0000e-005	5.9000e-004	0.0000								1.2700e-003	1.2700e-003	0.0000		1.3500e-003
Unmitigated	1.0068	1.0000e-005	5.9000e-004	0.0000								1.2700e-003	1.2700e-003	0.0000		1.3500e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.9174												0.0000			0.0000
Consumer Products	0.0893												0.0000			0.0000
Landscaping	5.0000e-005	1.0000e-005	5.9000e-004	0.0000								1.2700e-003	1.2700e-003	0.0000		1.3500e-003
Total	1.0068	1.0000e-005	5.9000e-004	0.0000								1.2700e-003	1.2700e-003	0.0000		1.3500e-003

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.9174												0.0000			0.0000
Consumer Products	0.0893												0.0000			0.0000
Landscaping	5.0000e-005	1.0000e-005	5.9000e-004	0.0000								1.2700e-003	1.2700e-003	0.0000		1.3500e-003
Total	1.0068	1.0000e-005	5.9000e-004	0.0000								1.2700e-003	1.2700e-003	0.0000		1.3500e-003

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Santa Felicia Dam Spillway Imp Alt 2A - Ventura County, Winter

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

Boilers

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

User Defined Equipment

Equipment Type	Number
----------------	--------

11.0 Vegetation

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

Santa Felicia Dam Spillway Imp Alt 2B
Ventura County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	3.11	Acre	3.11	135,471.60	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

Project Characteristics - Start of construction based on the schedule provided in the Constructability Analysis report.

Land Use - Acreage based on Constructability Analysis figures.

Construction Phase - Schedule based on Constructability Analysis, Table 3-1.

Off-road Equipment - Concrete Pump Truck, Water Truck, and Flatbed= Off-highway Truck.

Off-road Equipment - Equipment info based on Constructability Analysis report.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Equipment info based on Constructability Analysis report.

Off-road Equipment - Construction equipment info based on Constructability Analysis reports.

Off-road Equipment - Equipment info based on Constructability Analysis, Table 2. Chipper = generator set. Water truck, flatbed truck = off-highway truck.

Off-road Equipment - Flatbed Truck and Water Truck = Off-highway Truck.

Off-road Equipment - flatbed and water truck = off-highway truck.

Trips and VMT - Trip details based on Constructability Analysis report. It is assumed that works and vendors will be coming from the cities of Castaic and Santa Clarita, approximately 20 miles to the east.

Grading -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Area Coating -

Energy Use -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	0	72092
tblAreaCoating	Area_Nonresidential_Interior	0	216276
tblAreaCoating	Area_Parking	8128	601
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
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tblOffRoadEquipment	PhaseName		Chute Lining
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tblOffRoadEquipment	PhaseName		Labyrinth Weir
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tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	UsageHours	7.00	2.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

tblOffRoadEquipment	UsageHours	8.00	4.00
tblProjectCharacteristics	OperationalYear	2018	2023
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripNumber	0.00	11.00
tblTripsAndVMT	VendorTripNumber	0.00	11.00
tblTripsAndVMT	VendorTripNumber	0.00	13.00
tblTripsAndVMT	VendorTripNumber	0.00	3.00
tblTripsAndVMT	VendorTripNumber	22.00	9.00
tblTripsAndVMT	VendorTripNumber	22.00	53.00
tblTripsAndVMT	VendorTripNumber	22.00	41.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
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tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripNumber	23.00	28.00
tblTripsAndVMT	WorkerTripNumber	10.00	20.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
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tblTripsAndVMT	WorkerTripNumber	57.00	24.00
tblTripsAndVMT	WorkerTripNumber	57.00	20.00

2.0 Emissions Summary

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.8159	26.2789	22.4822	0.0609							0.0000	5,959.6122	5,959.6122	1.5926	0.0000	5,999.4264
2022	4.0821	38.8237	34.3499	0.1327							0.0000	13,265.3050	13,265.3050	3.0200	0.0000	13,340.8051
2023	4.0152	35.6604	35.2086	0.1493							0.0000	15,056.5246	15,056.5246	3.0858	0.0000	15,133.6687
Maximum	4.0821	38.8237	35.2086	0.1493							0.0000	15,056.5246	15,056.5246	3.0858	0.0000	15,133.6687

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.8159	26.2789	22.4822	0.0609							0.0000	5,959.6122	5,959.6122	1.5926	0.0000	5,999.4264
2022	4.0821	38.8237	34.3499	0.1327							0.0000	13,265.3049	13,265.3049	3.0200	0.0000	13,340.8051
2023	4.0152	35.6604	35.2086	0.1493							0.0000	15,056.5246	15,056.5246	3.0858	0.0000	15,133.6687
Maximum	4.0821	38.8237	35.2086	0.1493							0.0000	15,056.5246	15,056.5246	3.0858	0.0000	15,133.6687

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.9654	0.0000	3.2000e-004	0.0000								6.8000e-004	6.8000e-004	0.0000		7.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Total	0.9654	0.0000	3.2000e-004	0.0000								6.8000e-004	6.8000e-004	0.0000	0.0000	7.3000e-004

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.9654	0.0000	3.2000e-004	0.0000								6.8000e-004	6.8000e-004	0.0000		7.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Total	0.9654	0.0000	3.2000e-004	0.0000								6.8000e-004	6.8000e-004	0.0000	0.0000	7.3000e-004

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Site Preparation	10/1/2021	10/31/2021	5	21	
2	Selective Site Demolition	Demolition	11/1/2021	2/28/2022	5	86	
3	Demobilization/Reclamation	Site Preparation	9/1/2023	9/30/2023	5	21	
4	Excavation for Chute Deepening	Trenching	3/1/2022	8/31/2022	5	132	
5	Rock Stabilization/Permanent Facing	Building Construction	3/1/2022	12/31/2022	5	219	
6	Labyrinth Weir	Building Construction	9/1/2022	4/30/2023	5	172	
7	Chute Lining	Building Construction	1/1/2023	8/31/2023	5	174	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 3.11

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Concrete/Industrial Saws	0	8.00	81	0.73
Mobilization	Dumpers/Tenders	1	4.00	16	0.38
Mobilization	Excavators	1	4.00	158	0.38

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

Mobilization	Generator Sets	1	4.00	84	0.74
Mobilization	Graders	1	4.00	187	0.41
Mobilization	Off-Highway Trucks	2	8.00	402	0.38
Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Mobilization	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Selective Site Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Selective Site Demolition	Cranes	1	8.00	231	0.29
Selective Site Demolition	Dumpers/Tenders	2	8.00	16	0.38
Selective Site Demolition	Excavators	2	8.00	158	0.38
Selective Site Demolition	Off-Highway Trucks	2	8.00	402	0.38
Selective Site Demolition	Rubber Tired Dozers	0	8.00	247	0.40
Selective Site Demolition	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demobilization/Reclamation	Dumpers/Tenders	0	8.00	16	0.38
Demobilization/Reclamation	Off-Highway Trucks	1	8.00	402	0.38
Demobilization/Reclamation	Rubber Tired Dozers	0	8.00	247	0.40
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Excavation for Chute Deepening	Aerial Lifts	1	4.00	63	0.31
Excavation for Chute Deepening	Cranes	0	0.00	231	0.29
Excavation for Chute Deepening	Dumpers/Tenders	2	8.00	16	0.38
Excavation for Chute Deepening	Excavators	1	4.00	158	0.38

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

Excavation for Chute Deepening	Excavators	1	8.00	158	0.38
Excavation for Chute Deepening	Off-Highway Trucks	1	4.00	402	0.38
Excavation for Chute Deepening	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Rock Stabilization/Permanent Facing	Aerial Lifts	1	8.00	63	0.31
Rock Stabilization/Permanent Facing	Bore/Drill Rigs	1	8.00	221	0.50
Rock Stabilization/Permanent Facing	Off-Highway Trucks	2	8.00	402	0.38
Rock Stabilization/Permanent Facing	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Labyrinth Weir	Cranes	1	2.00	231	0.29
Labyrinth Weir	Excavators	1	8.00	158	0.38
Labyrinth Weir	Forklifts	0	8.00	89	0.20
Labyrinth Weir	Generator Sets	0	8.00	84	0.74
Labyrinth Weir	Off-Highway Tractors	1	8.00	124	0.44
Labyrinth Weir	Off-Highway Trucks	2	8.00	402	0.38
Labyrinth Weir	Off-Highway Trucks	1	4.00	402	0.38
Labyrinth Weir	Pavers	0	8.00	130	0.42
Labyrinth Weir	Plate Compactors	2	4.00	8	0.43
Labyrinth Weir	Rollers	0	8.00	80	0.38
Labyrinth Weir	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Labyrinth Weir	Welders	0	8.00	46	0.45
Chute Lining	Cranes	0	8.00	231	0.29
Chute Lining	Excavators	1	8.00	158	0.38
Chute Lining	Forklifts	0	8.00	89	0.20
Chute Lining	Generator Sets	0	8.00	84	0.74
Chute Lining	Off-Highway Tractors	1	2.00	124	0.44
Chute Lining	Off-Highway Trucks	1	4.00	402	0.38
Chute Lining	Off-Highway Trucks	2	8.00	402	0.38
Chute Lining	Plate Compactors	2	4.00	8	0.43

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Chute Lining	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Chute Lining	Welders	0	8.00	46	0.45
Demobilization/Reclamation	Generator Sets	2	4.00	84	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	8	20.00	11.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Selective Site Demolition	9	28.00	11.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	20.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Excavation for Chute Deepening	8	24.00	3.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Rock Stabilization/Permanent Labyrinth Weir	5	24.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
	9	24.00	53.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Chute Lining	7	20.00	41.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

3.2 Mobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.0492	19.2248	15.0863	0.0406								3,921.3216	3,921.3216	1.1768		3,950.7415
Total	2.0492	19.2248	15.0863	0.0406								3,921.3216	3,921.3216	1.1768		3,950.7415

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0591	1.7791	0.4924	6.7500e-003								725.7530	725.7530	0.0441		726.8549
Worker	0.1088	0.0686	0.8804	2.8200e-003								281.4355	281.4355	6.8000e-003		281.6056
Total	0.1679	1.8477	1.3728	9.5700e-003								1,007.1885	1,007.1885	0.0509		1,008.4605

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

3.2 Mobilization - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.0492	19.2248	15.0863	0.0406							0.0000	3,921.3216	3,921.3216	1.1768		3,950.7415
Total	2.0492	19.2248	15.0863	0.0406							0.0000	3,921.3216	3,921.3216	1.1768		3,950.7415

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0591	1.7791	0.4924	6.7500e-003								725.7530	725.7530	0.0441		726.8549
Worker	0.1088	0.0686	0.8804	2.8200e-003								281.4355	281.4355	6.8000e-003		281.6056
Total	0.1679	1.8477	1.3728	9.5700e-003								1,007.1885	1,007.1885	0.0509		1,008.4605

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

3.3 Selective Site Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6045	24.4038	20.7573	0.0502								4,839.8495	4,839.8495	1.5390		4,878.3237
Total	2.6045	24.4038	20.7573	0.0502								4,839.8495	4,839.8495	1.5390		4,878.3237

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0591	1.7791	0.4924	6.7500e-003								725.7530	725.7530	0.0441		726.8549
Worker	0.1523	0.0960	1.2325	3.9500e-003								394.0097	394.0097	9.5200e-003		394.2478
Total	0.2114	1.8752	1.7249	0.0107								1,119.7627	1,119.7627	0.0536		1,121.1027

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

3.3 Selective Site Demolition - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6045	24.4038	20.7573	0.0502							0.0000	4,839.8495	4,839.8495	1.5390		4,878.3237
Total	2.6045	24.4038	20.7573	0.0502							0.0000	4,839.8495	4,839.8495	1.5390		4,878.3237

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0591	1.7791	0.4924	6.7500e-003								725.7530	725.7530	0.0441		726.8549
Worker	0.1523	0.0960	1.2325	3.9500e-003								394.0097	394.0097	9.5200e-003		394.2478
Total	0.2114	1.8752	1.7249	0.0107								1,119.7627	1,119.7627	0.0536		1,121.1027

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

3.3 Selective Site Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3110	20.0460	20.0976	0.0503								4,841.1900	4,841.1900	1.5394		4,879.6751
Total	2.3110	20.0460	20.0976	0.0503								4,841.1900	4,841.1900	1.5394		4,879.6751

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0551	1.6334	0.4722	6.6800e-003								718.8063	718.8063	0.0432		719.8853
Worker	0.1435	0.0868	1.1425	3.8100e-003								379.5067	379.5067	8.6200e-003		379.7222
Total	0.1986	1.7202	1.6147	0.0105								1,098.3130	1,098.3130	0.0518		1,099.6075

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

3.3 Selective Site Demolition - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3110	20.0460	20.0976	0.0503							0.0000	4,841.1900	4,841.1900	1.5394		4,879.6751
Total	2.3110	20.0460	20.0976	0.0503							0.0000	4,841.1900	4,841.1900	1.5394		4,879.6751

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0551	1.6334	0.4722	6.6800e-003								718.8063	718.8063	0.0432		719.8853
Worker	0.1435	0.0868	1.1425	3.8100e-003								379.5067	379.5067	8.6200e-003		379.7222
Total	0.1986	1.7202	1.6147	0.0105								1,098.3130	1,098.3130	0.0518		1,099.6075

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

3.4 Demobilization/Reclamation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	1.1125	9.3548	11.4205	0.0260								2,506.0761	2,506.0761	0.6364		2,521.9866
Total	1.1125	9.3548	11.4205	0.0260								2,506.0761	2,506.0761	0.6364		2,521.9866

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0477	1.3085	0.5114	7.7000e-003								830.3678	830.3678	0.0479		831.5656
Worker	0.0966	0.0560	0.7551	2.6100e-003								260.6787	260.6787	5.5600e-003		260.8176
Total	0.1443	1.3645	1.2665	0.0103								1,091.0465	1,091.0465	0.0535		1,092.3833

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

3.4 Demobilization/Reclamation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	1.1125	9.3548	11.4205	0.0260							0.0000	2,506.0761	2,506.0761	0.6364		2,521.9866
Total	1.1125	9.3548	11.4205	0.0260							0.0000	2,506.0761	2,506.0761	0.6364		2,521.9866

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0477	1.3085	0.5114	7.7000e-003								830.3678	830.3678	0.0479		831.5656
Worker	0.0966	0.0560	0.7551	2.6100e-003								260.6787	260.6787	5.5600e-003		260.8176
Total	0.1443	1.3645	1.2665	0.0103								1,091.0465	1,091.0465	0.0535		1,092.3833

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

3.5 Excavation for Chute Deepening - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0622	9.2328	12.0866	0.0229								2,195.1840	2,195.1840	0.6836		2,212.2748
Total	1.0622	9.2328	12.0866	0.0229								2,195.1840	2,195.1840	0.6836		2,212.2748

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0150	0.4455	0.1288	1.8200e-003								196.0381	196.0381	0.0118		196.3324
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.1380	0.5199	1.1081	5.0800e-003								521.3295	521.3295	0.0192		521.8085

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

3.5 Excavation for Chute Deepening - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0622	9.2328	12.0866	0.0229							0.0000	2,195.1840	2,195.1840	0.6836		2,212.2748
Total	1.0622	9.2328	12.0866	0.0229							0.0000	2,195.1840	2,195.1840	0.6836		2,212.2748

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0150	0.4455	0.1288	1.8200e-003								196.0381	196.0381	0.0118		196.3324
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.1380	0.5199	1.1081	5.0800e-003								521.3295	521.3295	0.0192		521.8085

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

3.6 Rock Stabilization/Permanent Facing - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4817	12.5298	12.0905	0.0407								3,935.3902	3,935.3902	1.2728		3,967.2098
Total	1.4817	12.5298	12.0905	0.0407								3,935.3902	3,935.3902	1.2728		3,967.2098

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0451	1.3364	0.3864	5.4600e-003								588.1142	588.1142	0.0353		588.9971
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.1681	1.4108	1.3657	8.7200e-003								913.4057	913.4057	0.0427		914.4733

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

3.6 Rock Stabilization/Permanent Facing - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4817	12.5298	12.0905	0.0407							0.0000	3,935.3902	3,935.3902	1.2728		3,967.2098
Total	1.4817	12.5298	12.0905	0.0407							0.0000	3,935.3902	3,935.3902	1.2728		3,967.2098

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0451	1.3364	0.3864	5.4600e-003								588.1142	588.1142	0.0353		588.9971
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.1681	1.4108	1.3657	8.7200e-003								913.4057	913.4057	0.0427		914.4733

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

3.7 Labyrinth Weir - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0440	16.9386	17.6391	0.0479								4,627.8781	4,627.8781	1.4892		4,665.1076
Total	2.0440	16.9386	17.6391	0.0479								4,627.8781	4,627.8781	1.4892		4,665.1076

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2654	7.8701	2.2753	0.0322								3,463.3394	3,463.3394	0.2080		3,468.5382
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.3884	7.9445	3.2546	0.0354								3,788.6309	3,788.6309	0.2153		3,794.0144

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

3.7 Labyrinth Weir - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0440	16.9386	17.6391	0.0479							0.0000	4,627.8781	4,627.8781	1.4892		4,665.1076
Total	2.0440	16.9386	17.6391	0.0479							0.0000	4,627.8781	4,627.8781	1.4892		4,665.1076

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2654	7.8701	2.2753	0.0322								3,463.3394	3,463.3394	0.2080		3,468.5382
Worker	0.1230	0.0744	0.9793	3.2600e-003								325.2915	325.2915	7.3900e-003		325.4762
Total	0.3884	7.9445	3.2546	0.0354								3,788.6309	3,788.6309	0.2153		3,794.0144

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

3.7 Labyrinth Weir - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9211	14.9267	17.4041	0.0480								4,630.7394	4,630.7394	1.4901		4,667.9920
Total	1.9211	14.9267	17.4041	0.0480								4,630.7394	4,630.7394	1.4901		4,667.9920

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1943	5.3347	2.0848	0.0314								3,385.3456	3,385.3456	0.1953		3,390.2292
Worker	0.1160	0.0673	0.9062	3.1400e-003								312.8145	312.8145	6.6700e-003		312.9812
Total	0.3103	5.4019	2.9910	0.0345								3,698.1600	3,698.1600	0.2020		3,703.2103

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

3.7 Labyrinth Weir - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9211	14.9267	17.4041	0.0480							0.0000	4,630.7394	4,630.7394	1.4901		4,667.9919
Total	1.9211	14.9267	17.4041	0.0480							0.0000	4,630.7394	4,630.7394	1.4901		4,667.9919

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1943	5.3347	2.0848	0.0314								3,385.3456	3,385.3456	0.1953		3,390.2292
Worker	0.1160	0.0673	0.9062	3.1400e-003								312.8145	312.8145	6.6700e-003		312.9812
Total	0.3103	5.4019	2.9910	0.0345								3,698.1600	3,698.1600	0.2020		3,703.2103

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

3.8 Chute Lining - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5368	11.1490	12.4456	0.0399								3,848.0942	3,848.0942	1.2370		3,879.0187
Total	1.5368	11.1490	12.4456	0.0399								3,848.0942	3,848.0942	1.2370		3,879.0187

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1503	4.1268	1.6128	0.0243								2,618.8523	2,618.8523	0.1511		2,622.6301
Worker	0.0966	0.0560	0.7551	2.6100e-003								260.6787	260.6787	5.5600e-003		260.8176
Total	0.2470	4.1828	2.3679	0.0269								2,879.5310	2,879.5310	0.1567		2,883.4477

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

3.8 Chute Lining - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5368	11.1490	12.4456	0.0399							0.0000	3,848.0942	3,848.0942	1.2370		3,879.0187
Total	1.5368	11.1490	12.4456	0.0399							0.0000	3,848.0942	3,848.0942	1.2370		3,879.0187

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1503	4.1268	1.6128	0.0243								2,618.8523	2,618.8523	0.1511		2,622.6301
Worker	0.0966	0.0560	0.7551	2.6100e-003								260.6787	260.6787	5.5600e-003		260.8176
Total	0.2470	4.1828	2.3679	0.0269								2,879.5310	2,879.5310	0.1567		2,883.4477

4.0 Operational Detail - Mobile

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.593330	0.040945	0.188012	0.107577	0.017981	0.006204	0.019981	0.018142	0.001176	0.001026	0.003857	0.000384	0.001386

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.9654	0.0000	3.2000e-004	0.0000								6.8000e-004	6.8000e-004	0.0000		7.3000e-004
Unmitigated	0.9654	0.0000	3.2000e-004	0.0000								6.8000e-004	6.8000e-004	0.0000		7.3000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.9174												0.0000			0.0000
Consumer Products	0.0480												0.0000			0.0000
Landscaping	3.0000e-005	0.0000	3.2000e-004	0.0000								6.8000e-004	6.8000e-004	0.0000		7.3000e-004
Total	0.9654	0.0000	3.2000e-004	0.0000								6.8000e-004	6.8000e-004	0.0000		7.3000e-004

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.9174												0.0000			0.0000
Consumer Products	0.0480												0.0000			0.0000
Landscaping	3.0000e-005	0.0000	3.2000e-004	0.0000								6.8000e-004	6.8000e-004	0.0000		7.3000e-004
Total	0.9654	0.0000	3.2000e-004	0.0000								6.8000e-004	6.8000e-004	0.0000		7.3000e-004

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Summer

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

Boilers

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

User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

Santa Felicia Dam Spillway Imp Alt 2B
Ventura County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	3.11	Acre	3.11	135,471.60	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

Project Characteristics - Start of construction based on the schedule provided in the Constructability Analysis report.

Land Use - Acreage based on Constructability Analysis figures.

Construction Phase - Schedule based on Constructability Analysis, Table 3-1.

Off-road Equipment - Concrete Pump Truck, Water Truck, and Flatbed= Off-highway Truck.

Off-road Equipment - Equipment info based on Constructability Analysis report.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Equipment info based on Constructability Analysis report.

Off-road Equipment - Construction equipment info based on Constructability Analysis reports.

Off-road Equipment - Equipment info based on Constructability Analysis, Table 2. Chipper = generator set. Water truck, flatbed truck = off-highway truck.

Off-road Equipment - Flatbed Truck and Water Truck = Off-highway Truck.

Off-road Equipment - flatbed and water truck = off-highway truck.

Trips and VMT - Trip details based on Constructability Analysis report. It is assumed that works and vendors will be coming from the cities of Castaic and Santa Clarita, approximately 20 miles to the east.

Grading -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Area Coating -

Energy Use -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	0	72092
tblAreaCoating	Area_Nonresidential_Interior	0	216276
tblAreaCoating	Area_Parking	8128	601
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		Labyrinth Weir
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tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	UsageHours	7.00	2.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00

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tblOffRoadEquipment	UsageHours	8.00	4.00
tblProjectCharacteristics	OperationalYear	2018	2023
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripNumber	0.00	11.00
tblTripsAndVMT	VendorTripNumber	0.00	11.00
tblTripsAndVMT	VendorTripNumber	0.00	13.00
tblTripsAndVMT	VendorTripNumber	0.00	3.00
tblTripsAndVMT	VendorTripNumber	22.00	9.00
tblTripsAndVMT	VendorTripNumber	22.00	53.00
tblTripsAndVMT	VendorTripNumber	22.00	41.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripNumber	23.00	28.00
tblTripsAndVMT	WorkerTripNumber	10.00	20.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00

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tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
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tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	20.00	24.00
tblTripsAndVMT	WorkerTripNumber	57.00	24.00
tblTripsAndVMT	WorkerTripNumber	57.00	24.00
tblTripsAndVMT	WorkerTripNumber	57.00	20.00

2.0 Emissions Summary

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.8458	26.3222	22.4491	0.0607							0.0000	5,932.9108	5,932.9108	1.5935	0.0000	5,972.7493
2022	4.1401	38.9755	34.4140	0.1321							0.0000	13,191.6428	13,191.6428	3.0269	0.0000	13,267.3149
2023	4.0705	35.7637	35.3128	0.1484							0.0000	14,966.0405	14,966.0405	3.0942	0.0000	15,043.3950
Maximum	4.1401	38.9755	35.3128	0.1484							0.0000	14,966.0405	14,966.0405	3.0942	0.0000	15,043.3950

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	2.8458	26.3222	22.4491	0.0607							0.0000	5,932.9108	5,932.9108	1.5935	0.0000	5,972.7493
2022	4.1401	38.9755	34.4140	0.1321							0.0000	13,191.6428	13,191.6428	3.0269	0.0000	13,267.3149
2023	4.0705	35.7637	35.3128	0.1484							0.0000	14,966.0405	14,966.0405	3.0942	0.0000	15,043.3950
Maximum	4.1401	38.9755	35.3128	0.1484							0.0000	14,966.0405	14,966.0405	3.0942	0.0000	15,043.3950

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2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.9654	0.0000	3.2000e-004	0.0000								6.8000e-004	6.8000e-004	0.0000		7.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Total	0.9654	0.0000	3.2000e-004	0.0000								6.8000e-004	6.8000e-004	0.0000	0.0000	7.3000e-004

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.9654	0.0000	3.2000e-004	0.0000								6.8000e-004	6.8000e-004	0.0000		7.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Total	0.9654	0.0000	3.2000e-004	0.0000								6.8000e-004	6.8000e-004	0.0000	0.0000	7.3000e-004

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Site Preparation	10/1/2021	10/31/2021	5	21	
2	Selective Site Demolition	Demolition	11/1/2021	2/28/2022	5	86	
3	Demobilization/Reclamation	Site Preparation	9/1/2023	9/30/2023	5	21	
4	Excavation for Chute Deepening	Trenching	3/1/2022	8/31/2022	5	132	
5	Rock Stabilization/Permanent Facing	Building Construction	3/1/2022	12/31/2022	5	219	
6	Labyrinth Weir	Building Construction	9/1/2022	4/30/2023	5	172	
7	Chute Lining	Building Construction	1/1/2023	8/31/2023	5	174	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 3.11

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Concrete/Industrial Saws	0	8.00	81	0.73
Mobilization	Dumpers/Tenders	1	4.00	16	0.38
Mobilization	Excavators	1	4.00	158	0.38

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

Mobilization	Generator Sets	1	4.00	84	0.74
Mobilization	Graders	1	4.00	187	0.41
Mobilization	Off-Highway Trucks	2	8.00	402	0.38
Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Mobilization	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Selective Site Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Selective Site Demolition	Cranes	1	8.00	231	0.29
Selective Site Demolition	Dumpers/Tenders	2	8.00	16	0.38
Selective Site Demolition	Excavators	2	8.00	158	0.38
Selective Site Demolition	Off-Highway Trucks	2	8.00	402	0.38
Selective Site Demolition	Rubber Tired Dozers	0	8.00	247	0.40
Selective Site Demolition	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demobilization/Reclamation	Dumpers/Tenders	0	8.00	16	0.38
Demobilization/Reclamation	Off-Highway Trucks	1	8.00	402	0.38
Demobilization/Reclamation	Rubber Tired Dozers	0	8.00	247	0.40
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Excavation for Chute Deepening	Aerial Lifts	1	4.00	63	0.31
Excavation for Chute Deepening	Cranes	0	0.00	231	0.29
Excavation for Chute Deepening	Dumpers/Tenders	2	8.00	16	0.38
Excavation for Chute Deepening	Excavators	1	4.00	158	0.38

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Excavation for Chute Deepening	Excavators	1	8.00	158	0.38
Excavation for Chute Deepening	Off-Highway Trucks	1	4.00	402	0.38
Excavation for Chute Deepening	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Rock Stabilization/Permanent Facing	Aerial Lifts	1	8.00	63	0.31
Rock Stabilization/Permanent Facing	Bore/Drill Rigs	1	8.00	221	0.50
Rock Stabilization/Permanent Facing	Off-Highway Trucks	2	8.00	402	0.38
Rock Stabilization/Permanent Facing	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Labyrinth Weir	Cranes	1	2.00	231	0.29
Labyrinth Weir	Excavators	1	8.00	158	0.38
Labyrinth Weir	Forklifts	0	8.00	89	0.20
Labyrinth Weir	Generator Sets	0	8.00	84	0.74
Labyrinth Weir	Off-Highway Tractors	1	8.00	124	0.44
Labyrinth Weir	Off-Highway Trucks	2	8.00	402	0.38
Labyrinth Weir	Off-Highway Trucks	1	4.00	402	0.38
Labyrinth Weir	Pavers	0	8.00	130	0.42
Labyrinth Weir	Plate Compactors	2	4.00	8	0.43
Labyrinth Weir	Rollers	0	8.00	80	0.38
Labyrinth Weir	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Labyrinth Weir	Welders	0	8.00	46	0.45
Chute Lining	Cranes	0	8.00	231	0.29
Chute Lining	Excavators	1	8.00	158	0.38
Chute Lining	Forklifts	0	8.00	89	0.20
Chute Lining	Generator Sets	0	8.00	84	0.74
Chute Lining	Off-Highway Tractors	1	2.00	124	0.44
Chute Lining	Off-Highway Trucks	1	4.00	402	0.38
Chute Lining	Off-Highway Trucks	2	8.00	402	0.38
Chute Lining	Plate Compactors	2	4.00	8	0.43

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Chute Lining	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Chute Lining	Welders	0	8.00	46	0.45
Demobilization/Reclamation	Generator Sets	2	4.00	84	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	8	20.00	11.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Selective Site Demolition	9	28.00	11.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	20.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Excavation for Chute Deepening	8	24.00	3.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Rock Stabilization/Permanent Labyrinth Weir	5	24.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Chute Lining	9	24.00	53.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Chute Lining	7	20.00	41.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

3.2 Mobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.0492	19.2248	15.0863	0.0406								3,921.3216	3,921.3216	1.1768		3,950.7415
Total	2.0492	19.2248	15.0863	0.0406								3,921.3216	3,921.3216	1.1768		3,950.7415

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0615	1.8059	0.5245	6.6800e-003								718.3146	718.3146	0.0455		719.4526
Worker	0.1284	0.0804	0.8338	2.6900e-003								267.6762	267.6762	6.4600e-003		267.8378
Total	0.1899	1.8863	1.3583	9.3700e-003								985.9908	985.9908	0.0520		987.2904

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3.2 Mobilization - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	2.0492	19.2248	15.0863	0.0406							0.0000	3,921.3216	3,921.3216	1.1768		3,950.7415
Total	2.0492	19.2248	15.0863	0.0406							0.0000	3,921.3216	3,921.3216	1.1768		3,950.7415

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0615	1.8059	0.5245	6.6800e-003								718.3146	718.3146	0.0455		719.4526
Worker	0.1284	0.0804	0.8338	2.6900e-003								267.6762	267.6762	6.4600e-003		267.8378
Total	0.1899	1.8863	1.3583	9.3700e-003								985.9908	985.9908	0.0520		987.2904

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3.3 Selective Site Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6045	24.4038	20.7573	0.0502								4,839.8495	4,839.8495	1.5390		4,878.3237
Total	2.6045	24.4038	20.7573	0.0502								4,839.8495	4,839.8495	1.5390		4,878.3237

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0615	1.8059	0.5245	6.6800e-003								718.3146	718.3146	0.0455		719.4526
Worker	0.1797	0.1126	1.1673	3.7600e-003								374.7467	374.7467	9.0500e-003		374.9729
Total	0.2413	1.9184	1.6918	0.0104								1,093.0613	1,093.0613	0.0546		1,094.4256

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3.3 Selective Site Demolition - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6045	24.4038	20.7573	0.0502							0.0000	4,839.8495	4,839.8495	1.5390		4,878.3237
Total	2.6045	24.4038	20.7573	0.0502							0.0000	4,839.8495	4,839.8495	1.5390		4,878.3237

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0615	1.8059	0.5245	6.6800e-003								718.3146	718.3146	0.0455		719.4526
Worker	0.1797	0.1126	1.1673	3.7600e-003								374.7467	374.7467	9.0500e-003		374.9729
Total	0.2413	1.9184	1.6918	0.0104								1,093.0613	1,093.0613	0.0546		1,094.4256

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

3.3 Selective Site Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3110	20.0460	20.0976	0.0503								4,841.1900	4,841.1900	1.5394		4,879.6751
Total	2.3110	20.0460	20.0976	0.0503								4,841.1900	4,841.1900	1.5394		4,879.6751

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0574	1.6558	0.5026	6.6100e-003								711.3774	711.3774	0.0445		712.4902
Worker	0.1697	0.1017	1.0799	3.6200e-003								360.9626	360.9626	8.1800e-003		361.1670
Total	0.2271	1.7575	1.5826	0.0102								1,072.3399	1,072.3399	0.0527		1,073.6573

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

3.3 Selective Site Demolition - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3110	20.0460	20.0976	0.0503							0.0000	4,841.1900	4,841.1900	1.5394		4,879.6751
Total	2.3110	20.0460	20.0976	0.0503							0.0000	4,841.1900	4,841.1900	1.5394		4,879.6751

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0574	1.6558	0.5026	6.6100e-003								711.3774	711.3774	0.0445		712.4902
Worker	0.1697	0.1017	1.0799	3.6200e-003								360.9626	360.9626	8.1800e-003		361.1670
Total	0.2271	1.7575	1.5826	0.0102								1,072.3399	1,072.3399	0.0527		1,073.6573

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

3.4 Demobilization/Reclamation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	1.1125	9.3548	11.4205	0.0260								2,506.0761	2,506.0761	0.6364		2,521.9866
Total	1.1125	9.3548	11.4205	0.0260								2,506.0761	2,506.0761	0.6364		2,521.9866

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0498	1.3199	0.5389	7.6200e-003								821.7276	821.7276	0.0492		822.9568
Worker	0.1147	0.0657	0.7121	2.4900e-003								247.9474	247.9474	5.2600e-003		248.0789
Total	0.1645	1.3855	1.2510	0.0101								1,069.6750	1,069.6750	0.0544		1,071.0357

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

3.4 Demobilization/Reclamation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust													0.0000			0.0000
Off-Road	1.1125	9.3548	11.4205	0.0260							0.0000	2,506.0761	2,506.0761	0.6364		2,521.9866
Total	1.1125	9.3548	11.4205	0.0260							0.0000	2,506.0761	2,506.0761	0.6364		2,521.9866

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0498	1.3199	0.5389	7.6200e-003								821.7276	821.7276	0.0492		822.9568
Worker	0.1147	0.0657	0.7121	2.4900e-003								247.9474	247.9474	5.2600e-003		248.0789
Total	0.1645	1.3855	1.2510	0.0101								1,069.6750	1,069.6750	0.0544		1,071.0357

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

3.5 Excavation for Chute Deepening - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0622	9.2328	12.0866	0.0229								2,195.1840	2,195.1840	0.6836		2,212.2748
Total	1.0622	9.2328	12.0866	0.0229								2,195.1840	2,195.1840	0.6836		2,212.2748

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0157	0.4516	0.1371	1.8000e-003								194.0120	194.0120	0.0121		194.3155
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.1611	0.5388	1.0627	4.9000e-003								503.4085	503.4085	0.0192		503.8872

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

3.5 Excavation for Chute Deepening - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0622	9.2328	12.0866	0.0229							0.0000	2,195.1840	2,195.1840	0.6836		2,212.2748
Total	1.0622	9.2328	12.0866	0.0229							0.0000	2,195.1840	2,195.1840	0.6836		2,212.2748

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0157	0.4516	0.1371	1.8000e-003								194.0120	194.0120	0.0121		194.3155
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.1611	0.5388	1.0627	4.9000e-003								503.4085	503.4085	0.0192		503.8872

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

3.6 Rock Stabilization/Permanent Facing - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4817	12.5298	12.0905	0.0407								3,935.3902	3,935.3902	1.2728		3,967.2098
Total	1.4817	12.5298	12.0905	0.0407								3,935.3902	3,935.3902	1.2728		3,967.2098

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0470	1.3548	0.4113	5.4100e-003								582.0360	582.0360	0.0364		582.9466
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.1924	1.4419	1.3369	8.5100e-003								891.4325	891.4325	0.0434		892.5183

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

3.6 Rock Stabilization/Permanent Facing - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4817	12.5298	12.0905	0.0407							0.0000	3,935.3902	3,935.3902	1.2728		3,967.2098
Total	1.4817	12.5298	12.0905	0.0407							0.0000	3,935.3902	3,935.3902	1.2728		3,967.2098

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.0470	1.3548	0.4113	5.4100e-003								582.0360	582.0360	0.0364		582.9466
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.1924	1.4419	1.3369	8.5100e-003								891.4325	891.4325	0.0434		892.5183

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

3.7 Labyrinth Weir - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0440	16.9386	17.6391	0.0479								4,627.8781	4,627.8781	1.4892		4,665.1076
Total	2.0440	16.9386	17.6391	0.0479								4,627.8781	4,627.8781	1.4892		4,665.1076

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2765	7.9781	2.4218	0.0318								3,427.5455	3,427.5455	0.2145		3,432.9075
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.4220	8.0653	3.3474	0.0349								3,736.9420	3,736.9420	0.2215		3,742.4792

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

3.7 Labyrinth Weir - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0440	16.9386	17.6391	0.0479							0.0000	4,627.8781	4,627.8781	1.4892		4,665.1076
Total	2.0440	16.9386	17.6391	0.0479							0.0000	4,627.8781	4,627.8781	1.4892		4,665.1076

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2765	7.9781	2.4218	0.0318								3,427.5455	3,427.5455	0.2145		3,432.9075
Worker	0.1455	0.0872	0.9256	3.1000e-003								309.3965	309.3965	7.0100e-003		309.5717
Total	0.4220	8.0653	3.3474	0.0349								3,736.9420	3,736.9420	0.2215		3,742.4792

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

3.7 Labyrinth Weir - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9211	14.9267	17.4041	0.0480								4,630.7394	4,630.7394	1.4901		4,667.9920
Total	1.9211	14.9267	17.4041	0.0480								4,630.7394	4,630.7394	1.4901		4,667.9920

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2032	5.3810	2.1969	0.0311								3,350.1202	3,350.1202	0.2005		3,355.1316
Worker	0.1376	0.0788	0.8545	2.9800e-003								297.5369	297.5369	6.3100e-003		297.6947
Total	0.3408	5.4598	3.0515	0.0340								3,647.6571	3,647.6571	0.2068		3,652.8263

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

3.7 Labyrinth Weir - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9211	14.9267	17.4041	0.0480							0.0000	4,630.7394	4,630.7394	1.4901		4,667.9919
Total	1.9211	14.9267	17.4041	0.0480							0.0000	4,630.7394	4,630.7394	1.4901		4,667.9919

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.2032	5.3810	2.1969	0.0311								3,350.1202	3,350.1202	0.2005		3,355.1316
Worker	0.1376	0.0788	0.8545	2.9800e-003								297.5369	297.5369	6.3100e-003		297.6947
Total	0.3408	5.4598	3.0515	0.0340								3,647.6571	3,647.6571	0.2068		3,652.8263

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

3.8 Chute Lining - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5368	11.1490	12.4456	0.0399								3,848.0942	3,848.0942	1.2370		3,879.0187
Total	1.5368	11.1490	12.4456	0.0399								3,848.0942	3,848.0942	1.2370		3,879.0187

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1572	4.1626	1.6995	0.0240								2,591.6024	2,591.6024	0.1551		2,595.4792
Worker	0.1147	0.0657	0.7121	2.4900e-003								247.9474	247.9474	5.2600e-003		248.0789
Total	0.2719	4.2283	2.4116	0.0265								2,839.5498	2,839.5498	0.1603		2,843.5581

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

3.8 Chute Lining - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5368	11.1490	12.4456	0.0399							0.0000	3,848.0942	3,848.0942	1.2370		3,879.0187
Total	1.5368	11.1490	12.4456	0.0399							0.0000	3,848.0942	3,848.0942	1.2370		3,879.0187

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Vendor	0.1572	4.1626	1.6995	0.0240								2,591.6024	2,591.6024	0.1551		2,595.4792
Worker	0.1147	0.0657	0.7121	2.4900e-003								247.9474	247.9474	5.2600e-003		248.0789
Total	0.2719	4.2283	2.4116	0.0265								2,839.5498	2,839.5498	0.1603		2,843.5581

4.0 Operational Detail - Mobile

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.593330	0.040945	0.188012	0.107577	0.017981	0.006204	0.019981	0.018142	0.001176	0.001026	0.003857	0.000384	0.001386

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000								0.0000	0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.9654	0.0000	3.2000e-004	0.0000								6.8000e-004	6.8000e-004	0.0000		7.3000e-004
Unmitigated	0.9654	0.0000	3.2000e-004	0.0000								6.8000e-004	6.8000e-004	0.0000		7.3000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.9174												0.0000			0.0000
Consumer Products	0.0480												0.0000			0.0000
Landscaping	3.0000e-005	0.0000	3.2000e-004	0.0000								6.8000e-004	6.8000e-004	0.0000		7.3000e-004
Total	0.9654	0.0000	3.2000e-004	0.0000								6.8000e-004	6.8000e-004	0.0000		7.3000e-004

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.9174												0.0000			0.0000
Consumer Products	0.0480												0.0000			0.0000
Landscaping	3.0000e-005	0.0000	3.2000e-004	0.0000								6.8000e-004	6.8000e-004	0.0000		7.3000e-004
Total	0.9654	0.0000	3.2000e-004	0.0000								6.8000e-004	6.8000e-004	0.0000		7.3000e-004

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

Fire Pumps and Emergency Generators

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Winter

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

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

Equipment Type	Number
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11.0 Vegetation

Final Environmental Impact Report
Santa Felicia Dam Safety
Improvement Project

APPENDIX

B

SUMMARY OF SPECIAL STATUS
SPECIES INFORMATION

Table B-1. Potentially Occurring Special Status Plant Species

Scientific Name	Common Name	Listing Status	Habitat Conditions and Elevation Range	Bloom Period	Lifeform	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
<i>Acanthoscyphus</i> (=Oxytheca) <i>parishii</i> var. <i>abramsii</i>	Abrams' oxytheca	CRPR 1B.2	Chaparral (sandy or shale). Elevation 3,750-6,750 feet (ft).	Jun-Aug	annual herb	LOW	The Project area is outside the known elevation range for this species. This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).
<i>Acanthoscyphus</i> <i>parishii</i> var. <i>parishii</i>	Parish's oxytheca	CRPR 4.2	Chaparral, lower montane coniferous forest; sandy or gravelly soils. Elevation 4,000-8,530 ft.	Jun-Sep	annual herb	LOW	The Project area is outside the known elevation range for this species. This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).
<i>Arenaria paludicola</i>	Marsh sandwort	FE/ CRPR 1B.1	Freshwater marsh, marsh and swamp, wetland. Growing up through dense mats of <i>Typha</i> , <i>Juncus</i> , <i>Scirpus</i> , etc. in freshwater marsh. Sandy soil. Elevation 3-170 m.	May-Aug	perennial herb	LOW	Suitable habitat for this species is only marginal within the Project area and vicinity. This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). This species was listed as a trust resource in an IPaC query of the Piru area (USFWS 2017a).
<i>Berberis nevini</i>	Nevin's barberry	FE/SE/ CRPR 1B.1	Chaparral, cismontane woodland, coastal scrub, riparian scrub. On steep, north facing slopes or in low grade sandy washes. Elevation 290-1,575 m.	Mar-Jun	shrub	LOW	Suitable habitat for this species is present within the Project area and vicinity. However, this species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). Due to the high likelihood of detecting a shrub, its very likely that this species is not present. CNDDB occurrences recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles include one extant population recorded in 2012 (CDFW 2017a).

Table B-1. Potentially Occurring Special Status Plant Species

Scientific Name	Common Name	Listing Status	Habitat Conditions and Elevation Range	Bloom Period	Lifeform	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
<i>Calochortus catalinae</i>	Catalina mariposa lily	CRPR 4.2	Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland. Elevation 45-2,295 ft.	(Feb)Mar-Jun	perennial bulbiferous herb	HIGH	Suitable habitat for this species is present within the Project area and vicinity. This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).
<i>Calochortus clavatus</i> var. <i>clavatus</i>	Club-haired mariposa lily	CRPR 4.3	Chaparral, cismontane woodland, coastal scrub, Valley and foothill grassland; usually serpentinite, clay, rocky. Elevation 245-4,265 ft.	(Mar)May-Jun	perennial bulbiferous herb	HIGH	Suitable habitat for this species is present within the Project area and vicinity. This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).
<i>Calochortus clavatus</i> var. <i>gracilis</i>	Slender mariposa lily	CRPR 1B.2	Chaparral, coastal scrub, valley and foothill grassland. Shaded foothill canyons; often on grassy slopes within other habitat. Elevation 1,045-3,280 ft.	Mar-Jun(Nov)	perennial bulbiferous herb	KNOWN	Suitable habitat for this species is present within the Project area and vicinity. This species has been observed within the Project area during protocol level surveys or during other incidental surveys conducted in the Project area (United 2010, BRC 2016). This species was also recorded in abundance in 2002, 2003, 2004 and 2005 on Newhall Ranch approximately at several locations ranging from 3.7 to 5 miles southeast of the Project area (CDFW 2017a). This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).
<i>Calochortus fimbriatus</i>	Late-flowered mariposa lily	CRPR 1B.3	Chaparral, cismontane woodland, riparian woodland. Dry, open coastal woodland, chaparral. often serpentinite. Elevation 900-6,250 ft.	Jun-Aug	perennial bulbiferous herb	LOW	Suitable habitat for this species is present within the Project area and vicinity, however, the Project area is at the lower extent of this species' elevation range. This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area

Table B-1. Potentially Occurring Special Status Plant Species

Scientific Name	Common Name	Listing Status	Habitat Conditions and Elevation Range	Bloom Period	Lifeform	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
							<p>completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).</p> <p>CNDDDB occurrences recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles include 5 populations recorded from 1998-2004 (CDFW 2017a).</p> <p>This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).</p>
<i>Calochortus plummerae</i>	Plummer's mariposa lily	CRPR 4.2	Chaparral, cismontane woodland, coastal scrub, Lower montane coniferous forest, valley and foothill grassland. Occurs on rocky and sandy sites, usually of granitic or alluvial material. Can be very common after fire; granitic, rocky soils. Elevation 325-5,575 ft.	May-Jul	perennial bulbiferous herb	HIGH	<p>Suitable habitat for this species is present within the Project area and vicinity.</p> <p>This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).</p> <p>CNDDDB occurrences recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles include 17 occurrences recorded from 1998-2010 (CDFW 2017a).</p> <p>This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).</p>
<i>Calystegia peirsonii</i>	Peirson's morning-glory	CRPR 4.2	Chaparral, chenopod scrub, cismontane woodland, coastal scrub, lower montane coniferous forest, Valley and foothill grassland. Often in disturbed areas or along roadsides or in grassy, open areas. Elevation 95-4,920 ft.	Apr-Jun	perennial rhizomatous herb	HIGH	<p>Suitable habitat for this species is present within the Project area and vicinity.</p> <p>This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).</p> <p>Eight CNDDDB occurrences are recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles from 1982 (CDFW 2017a).</p> <p>This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).</p>
<i>Castilleja gleasoni</i>	Mt. Gleason paintbrush	SR/ CRPR 1B.2	Chaparral, lower montane coniferous forest, Pinyon and juniper woodland;	May-Jun(Sep)	perennial herb (hemiparasitic)	LOW	<p>The Project area is outside the known elevation range for this species.</p> <p>This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area</p>

Table B-1. Potentially Occurring Special Status Plant Species

Scientific Name	Common Name	Listing Status	Habitat Conditions and Elevation Range	Bloom Period	Lifeform	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
			granitic. Elevation 3,805-7,120 ft.				completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).
<i>Cercocarpus betuloides</i> var. <i>blancheae</i>	Island mountain-mahogany	CRPR 4.3	Closed-cone coniferous forest, chaparral. Elevation 95-1,970 ft.	Feb-May	perennial evergreen shrub	LOW	Suitable habitat for this species is not present within the Project area and only marginal habitat is found in the Project vicinity. This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).
<i>Chorizanthe parryi</i> var. <i>fernandina</i>	San Fernando Valley spineflower	FPT/SE/CRPR 1B.1	Coastal scrub (sandy), valley and foothill grassland. Elevation 490-4,005 ft.	Apr-Jul	annual herb	MOD	Suitable habitat for this species is present within the Project area and vicinity. This species was listed as a trust resource in an IPaC query of the Piru area (USFWS 2017a). This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). Eleven CNDDDB occurrences are recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles from 2011 (CDFW 2017a). This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).
<i>Clarkia exilis</i>	Slender clarkia	CRPR 4.3	Cismontane woodland. Elevation 390-3,280 ft.	Apr-May	annual herb	LOW	Suitable habitat for this species is not present within the Project area or vicinity. This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).

Table B-1. Potentially Occurring Special Status Plant Species

Scientific Name	Common Name	Listing Status	Habitat Conditions and Elevation Range	Bloom Period	Lifeform	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
							This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).
<i>Clinopodium mimuloides</i>	Monkey-flower savory	CRPR 4.2	Chaparral, north coast coniferous forest; streambanks, mesic. Elevation 1,000-5,905 ft.	Jun-Oct	perennial herb	LOW	Suitable habitat for this species is marginal within the Project area and vicinity. This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).
<i>Convolvulus simulans</i>	Small-flowered morning-glory	CRPR 4.2	Chaparral (openings), coastal scrub, valley and foothill grassland. clay, serpentinite seeps. Elevation 95-2,430 ft.	Mar-Jul	annual herb	LOW	Suitable habitat for this species is not present within the Project area and vicinity. This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).
<i>Deinandra minthornii</i>	Santa Susana tarplant	SR/ CRPR 1B.2	Chaparral, coastal scrub, on sandstone outcrops and crevices in shrubland; rocky. Elevation 915-2,495 ft.	Jul-Nov	perennial deciduous shrub	LOW	Suitable habitat for this species is present within the Project area and vicinity, however, the Project area is at the lower extent of this species' elevation range. This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). CNDDB occurrences recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles include 9 records dated from 1985-2010 (CDFW 2017a). This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).
<i>Deinandra paniculata</i>	Paniculate tarplant	CRPR 4.2	Coastal scrub, valley and foothill grassland, vernal pools; usually vernal	(Mar)Apr-Nov	annual herb	HIGH	Suitable habitat for this species is present within the Project area and vicinity.

Table B-1. Potentially Occurring Special Status Plant Species

Scientific Name	Common Name	Listing Status	Habitat Conditions and Elevation Range	Bloom Period	Lifeform	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
			mesic, sometimes sandy. Elevation 80-3,085 ft.				<p>This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).</p> <p>This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).</p>
<i>Delphinium parryi</i> ssp. <i>purpureum</i>	Mt. Pinos larkspur	CRPR 4.3	Chaparral, Mojavean desert scrub, pinyon and juniper woodland. Elevation 3,280-8,530 ft.	May-Jun	perennial herb	LOW	<p>The Project area is outside the known elevation range for this species.</p> <p>This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).</p> <p>This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).</p>
<i>Delphinium umbraculorum</i>	umbrella larkspur	CRPR 1B.3	Cismontane woodland, mesic sites. Elevation 400-1,600 m.	Apr-Jun	perennial herb	LOW	<p>Suitable habitat for this species is not present within the Project area and vicinity.</p> <p>This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).</p> <p>CNDDDB occurrences recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles includes one occurrence from 1999 (CDFW 2017a).</p>
<i>Dodecahema leptoceras</i>	Slender-horned spineflower	FE/SE/CRPR 1B.1	Chaparral, cismontane woodland, coastal scrub (alluvial fan sage scrub). Flood deposited terraces and washes; associates include <i>Encelia</i> , <i>Dalea</i> , <i>Lepidospartum</i> , etc. Sandy soils. Elevation 200-765 m.	Apr-Jun	annual herb	MOD	<p>Suitable habitat for this species is present within the Project area and vicinity.</p> <p>This species was listed as a trust resource in an IPaC query of the Piru area (USFWS 2017a).</p> <p>This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).</p>

Table B-1. Potentially Occurring Special Status Plant Species

Scientific Name	Common Name	Listing Status	Habitat Conditions and Elevation Range	Bloom Period	Lifeform	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
							One CNDDDB occurrence (dated 1893, likely extirpated) is recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles (CDFW 2017a).
<i>Dudleya parva</i> (= <i>D. abramsii</i> ssp. <i>parva</i>)	Conejo dudleya	FT/ CRPR 1B.2	Coastal scrub, valley and foothill grassland, rocky or gravelly, clay or volcanic. In clay or volcanic soils on rocky slopes and grassy hillsides. Elevation 195-1,475 ft.	May-Jun	perennial herb	LOW	Suitable habitat for this species is not present within the Project area and vicinity. This species was listed as a trust resource in an IPaC query of the Piru area (USFWS 2017a). This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). Two CNDDDB occurrences (from 1988 and 1998) are recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles (CDFW 2017a). This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).
<i>Galium grande</i>	San Gabriel bedstraw	CRPR 1B.2	Cismontane woodland, chaparral, broadleaved upland forest, lower montane coniferous forest. Open chaparral and low, open oak forest; on rocky slopes; probably undercollected due to inaccessible habitat. Elevation 425-1450 m.	Jan-Jul	shrub	LOW	Suitable habitat for this species is not present within the Project area and vicinity. This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).
<i>Harpagonella palmeri</i>	Palmer's grapplinghook	CRPR 4.2	Chaparral, coastal scrub, valley and foothill grassland; clay soils; open grassy areas within shrubland. Elevation 20-955 m.	Mar-May	annual herb	LOW	Suitable habitat for this species is present within the Project area and vicinity. This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).

Table B-1. Potentially Occurring Special Status Plant Species

Scientific Name	Common Name	Listing Status	Habitat Conditions and Elevation Range	Bloom Period	Lifeform	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
							CNDDDB occurrences recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles include one occurrence of unknown date.
<i>Helianthus inexpectatus</i>	Newhall sunflower	CRPR 1B.1	Marshes and swamps, riparian woodland. Elevation 305 m.	Aug-Oct	perennial herb	LOW	This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). CNDDDB occurrences recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles include one occurrence from 2003 (CDFW 2017a).
<i>Helianthus nuttallii</i> ssp. <i>parishii</i>	Los Angeles sunflower	CRPR 1A	Marshes and swamps (coastal salt and freshwater). Elevation 30-5,495 ft.	Aug-Oct	perennial rhizomatous herb	LOW	Suitable habitat for this species is not present within the Project area and vicinity. This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).
<i>Hordeum intercedens</i>	Vernal barley	CRPR 3.2	Coastal dunes, coastal scrub, valley and foothill grassland (saline flats and depressions), vernal pools. Elevation 15-3,280 ft.	Mar-Jun	annual herb	LOW	Suitable habitat for this species is not present within the Project area and vicinity. This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).
<i>Horkelia cuneata</i> var. <i>puberula</i>	Mesa horkelia	CRPR 1B.1	Chaparral (maritime), cismontane woodland, Coastal scrub. Sandy or gravelly. Elevation 225-2,655 ft.	Feb-Jul(Sep)	perennial herb	HIGH	Suitable habitat for this species is present within the Project area and vicinity. This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).

Table B-1. Potentially Occurring Special Status Plant Species

Scientific Name	Common Name	Listing Status	Habitat Conditions and Elevation Range	Bloom Period	Lifeform	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
							CNDDDB occurrences recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles include 3 occurrences from 1995, 2002 and 2011 (CDFW 2017a). This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).
<i>Juglans californica</i>	Southern California black walnut	CRPR 4.2	Chaparral, cismontane woodland, coastal scrub, riparian woodland; alluvial. Elevation 160-2,955 ft.	Mar-Aug	perennial deciduous tree	HIGH	This species was detected during protocol surveys of the Project vicinity completed in 2004. California Walnut Woodland is not present in the Project area but is common in the immediate vicinity (United 2004). This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).
<i>Juncus acutus</i> ssp. <i>leopoldii</i>	Southwestern spiny rush	CRPR 4.2	Coastal dunes (mesic), meadows and seeps (alkaline seeps), marshes and swamps (coastal salt). Elevation 5-2,955 ft.	(Mar)May-Jun	perennial rhizomatous herb	HIGH	This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).
<i>Lepechinia rossii</i>	Ross' pitcher sage	CRPR 1B.2	Chaparral. Soil derived from fine-grained, reddish sedimentary rock. Elevation 1,000-2,590 ft.	May-Sep	perennial shrub	LOW	Suitable habitat for this species is not present within the Project area and vicinity. This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). CNDDDB occurrences recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles include 2 records from 1996 and 2005 (CDFW 2017a). This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).
<i>Lupinus paynei</i>	Payne's bush lupine	CRPR 3.1	Coastal scrub, riparian scrub, valley and foothill grassland; sandy. Elevation 720-1,380 ft.	Mar-Apr(May-Jul)	perennial shrub	MOD	Suitable habitat for this species is present within the Project area and vicinity. This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area

Table B-1. Potentially Occurring Special Status Plant Species

Scientific Name	Common Name	Listing Status	Habitat Conditions and Elevation Range	Bloom Period	Lifeform	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
							<p>completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).</p> <p>There is a mapped occurrence of this species from 2008 located approximately 3.2 miles southwest of the Project area (CDFW 2017a).</p> <p>This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).</p>
<i>Monardella linoides</i> ssp. <i>oblonga</i>	Tehachapi monardella	CRPR 1B.3	Lower montane coniferous forest, pinyon and juniper woodland, upper montane coniferous forest. Elevation 2,950-8,105 ft.	(May)Jun-Aug	perennial rhizomatous herb	LOW	<p>The Project area is outside the known elevation range for this species.</p> <p>This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).</p> <p>This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).</p>
<i>Monardella sinuata</i> ssp. <i>gerryi</i>	Gerry's curly-leaved monardella	CRPR 1B.1	Coastal scrub; sandy openings. Elevation 490-805 ft.	Apr-Jun	annual herb	MOD	<p>Suitable habitat for this species is present within the Project area and vicinity.</p> <p>This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).</p> <p>CNDDDB occurrences recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles includes one extant occurrences from 2015 (CDFW 2017a).</p> <p>This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).</p>
<i>Nasturtium</i> (=Rorippa) <i>gambelii</i>	Gambel's watercress	FE	Marshes and swamps. Freshwater and brackish marshes at the margins of lakes and along streams, in or just above the water level. 5-330 m.	Apr-Oct	perennial herb	LOW	<p>Suitable habitat for this species is present within the Project area and vicinity.</p> <p>This species was listed as a trust resource in an IPaC query of the Piru area (USFWS 2017a).</p> <p>This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).</p>

Table B-1. Potentially Occurring Special Status Plant Species

Scientific Name	Common Name	Listing Status	Habitat Conditions and Elevation Range	Bloom Period	Lifeform	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
<i>Navarretia fossalis</i>	Spreading navarretia	FT/ CRPR 1B.1	Vernal pools, chenopod scrub, marshes and swamps, playas. San Diego hardpan and San Diego claypan vernal pools; in swales and vernal pools, often surrounded by other habitat types. Elevation 15-850 m.	Apr-Jun	annual herb	LOW	<p>Suitable habitat for this species is not present within the Project area and vicinity.</p> <p>This species was listed as a trust resource in an IPaC query of the Piru area (USFWS 2017a).</p> <p>This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).</p> <p>There are multiple CNDDDB occurrence of this species from 2003 located approximately 3-7-4.4 miles southeast of the Project area (CDFW 2017a). However, the project area and vicinity do not provide the required habitat conditions (i.e., vernal pools, chenopod scrub, marshes and swamps, playas) for this species.</p> <p>This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).</p>
<i>Navarretia ojaiensis</i>	Ojai navarretia	CRPR 1B.1	Chaparral, coastal scrub, valley and foothill grassland. Openings in shrublands or grasslands. 275-620 m. Elevation 900-2,035 ft.	May-Jul	annual herb	MOD	<p>Suitable habitat for this species is present within the Project area and vicinity.</p> <p>This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).</p> <p>CNDDDB occurrences recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles include 5 occurrences from 2003 (CDFW 2017a).</p>
<i>Opuntia basilaris</i> var. <i>brachyclada</i>	Short-joint beavertail	CRPR 1B.2	Chaparral, Joshua tree woodland, Mojavean desert scrub, pinyon-juniper woodland. Sandy soil or coarse, granitic loam. Elevation 425-1,800 m.	Apr-Jun	shrub	LOW	<p>Suitable habitat for this species is present within the Project area and vicinity.</p> <p>This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). However, because this species is a shrub, it does not go easily undetected, and is likely not present in the Project area.</p>

Table B-1. Potentially Occurring Special Status Plant Species

Scientific Name	Common Name	Listing Status	Habitat Conditions and Elevation Range	Bloom Period	Lifeform	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
							CNDDB occurrences recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles include 3 occurrences from 1985 (2) and 2002 (1) (CDFW 2017a).
<i>Orcuttia californica</i>	California Orcutt grass	FE/SE/CRPR 1B.1	Vernal pools. Elevation 45-2,165 ft.	Apr-Aug	annual herb	MOD	<p>Suitable habitat for this species is present within the Project area and vicinity.</p> <p>This species was listed as a trust resource in an IPaC query of the Piru area (USFWS 2017a).</p> <p>This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).</p> <p>Occurrences recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles include 3 occurrences dated, 2003, 2011, and date unknown (CDFW 2017a).</p> <p>This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).</p>
<i>Pentachaeta lyonii</i>	Lyon's pentachaeta	FE/SE/CRPR 1B.1	Chaparral (openings), coastal scrub, valley and foothill grassland; rocky, clay. Edges of clearings in chaparral, usually at the ecotone between grassland and chaparral or edges of firebreaks. Elevation 95-2,265 ft.	(Feb)Mar-Aug	annual herb	MOD	<p>Suitable habitat for this species is present within the Project area and vicinity.</p> <p>This species was listed as a trust resource in an IPaC query of the Piru area (USFWS 2017a).</p> <p>This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).</p> <p>Four occurrences are recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles from 1991, 1995, 1995 and 2011 (CDFW 2017a).</p> <p>This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).</p>
<i>Phacelia hubbyi</i>	Hubby's phacelia	CRPR 4.2	Chaparral, coastal scrub, valley and foothill grassland;	Apr-Jul	annual herb	MOD	Suitable habitat for this species is present within the Project area and vicinity.

Table B-1. Potentially Occurring Special Status Plant Species

Scientific Name	Common Name	Listing Status	Habitat Conditions and Elevation Range	Bloom Period	Lifeform	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
			gravelly, rocky, talus. Elevation 0-3,280 ft.				<p>This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).</p> <p>This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).</p>
<i>Pseudognaphalium leucocephalum</i>	White rabbit-tobacco	CRPR 2B.2	Chaparral, cismontane woodland, coastal scrub, Riparian woodland. Sandy, gravelly. Elevation 0-6,890 ft.	(Jul)Aug-Nov(Dec)	perennial herb	HIGH	<p>Suitable habitat for this species is present within the Project area and vicinity.</p> <p>This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).</p> <p>CDFW reports a 2015 occurrence located south of Piru on the Santa Clara River approximately 4.3 miles south of the Project. Additional occurrences recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles include 7 occurrences dated 2003 (2), 2005 (1), 2009 (1), and 2015 (3) (CDFW 2017a).</p> <p>This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).</p>
<i>Senecio aphanactis</i>	Chaparral ragwort	CRPR 2B.2	Chaparral, cismontane woodland, coastal scrub. Drying alkaline flats. Elevation 20-855 m.	Jan-Apr	annual herb	MOD	<p>Suitable habitat for this species is present within the Project area and vicinity.</p> <p>This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016).</p> <p>CNDDDB occurrences recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles include one historical occurrence from 1901 (CDFW 2017a).</p>
<i>Stylocline masonii</i>	Mason's neststraw	CRPR 1B.1	Chenopod scrub, pinyon and juniper woodland; sandy. Elevation 325-3,935 ft.	Mar-May	annual herb	LOW	<p>Suitable habitat for this species is present within the Project area and vicinity.</p> <p>This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area</p>

Table B-1. Potentially Occurring Special Status Plant Species

Scientific Name	Common Name	Listing Status	Habitat Conditions and Elevation Range	Bloom Period	Lifeform	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
							completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).
<i>Symphyotrichum greatae</i>	Greata's aster	CRPR 1B.3	Broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, riparian woodland; mesic canyons. Elevation 980-6,595 ft.	Jun-Oct	perennial rhizomatous herb	LOW	Suitable habitat for this species is not present within the Project area and vicinity. This species was not detected during protocol surveys of the Project area completed in 2004, or annual reconnaissance surveys of the Project area completed by qualified biologists since 2012 (United 2004a, 2010, BRC 2016). Historical occurrence from 1890 recorded at Hopper Canyon, approximately 4.5 miles southwest of the Project area. Three CNDDDB occurrences are recorded >5-miles from the Project area, but within the 12 surrounding 7.5-minute quadrangles dated 1890, 1996 and 2007 (CDFW 2017a). This species was listed by the CNPS as occurring in one or more of the 9 surrounding 7.5-minute quadrangles (CNPS 2017).

Sources: BRC 2016, CDFW 2017a, CNPS 2017, United 2004c, 2010, USFWS 2017a
Listing Status Key: federal/state
 FE Federal Endangered
 FT Federal Threatened
 SE State Endangered
 SR State Rare
California Native Plant Society designation:
 List 1B - Plants rare, threatened, or endangered in California and elsewhere
 List 2 – Plants rare, threatened, or endangered in California, but more common elsewhere
 List 3 – Plants about which we need more information - a review list
 List 4 – Plant of limited distribution – a watch list
 0.1 – Seriously threatened in California (high degree/immediacy of threat)
 0.2 – Fairly threatened in California (moderate degree/immediacy of threats)
 0.3 – Not very threatened in California (low degree/immediacy of threats or no current threats known)

Table B-2. Potentially Occurring Special Status Wildlife Species

Scientific Name	Common Name	Listing Status	Habitat Conditions	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
Invertebrates					
<i>Branchinecta lynchi</i>	Vernal pool fairy shrimp	FT	Endemic to the grasslands of the Central Valley, Central Coast mountains, and South Coast mountains, in astatic rain-filled pools. Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	NONE. Suitable habitat for this species does not exist within the Project area.	This species was listed as a trust resource in an IPaC query of the Piru area (USFWS 2017a). Appropriate habitat for this species (i.e., astatic rain-filled pools, small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools) does not exist in the Project area. No current or historical occurrences of this species have been recorded within 5-miles of the Project area. There are no recorded occurrences of this species within the twelve 7.5-minute quadrangles surrounding the Project (CDFW 2017a).
<i>Danaus plexippus</i>	Monarch - California overwintering population	Not Listed	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby.	LOW. Marginal habitat available in the Project vicinity, but no suitable habitat within the Project area.	Appropriate habitat for this species including wind-protected tree groves [eucalyptus, Monterey pine, cypress], with nectar and water sources nearby) does not exist in the Project area, but is available in the vicinity of the Project. No current or historical occurrences of this species have been recorded within 5-miles of the Project area. There is one recorded occurrences of this species from 1990 within the twelve 7.5-minute quadrangles surrounding the Project, but >5-miles from the Project area (CDFW 2017a).
<i>Streptocephalus woottoni</i>	Riverside fairy shrimp	FE	Endemic to western Riverside, ORA and San Diego Counties in areas of tectonic swales/earth slump basins in grassland and coastal sage scrub. Inhabit seasonally astatic pools filled by winter/spring rains. Hatch in warm water later in the season.	NONE. Suitable habitat for this species does not exist within the Project area.	This species was listed as a trust resource in an IPaC query of the Piru area (USFWS 2017a). Appropriate habitat for this species (i.e., tectonic swales/earth slump basins in grassland and coastal sage scrub and seasonally astatic pools filled by winter/spring rains) does not exist in the Project area or vicinity. No current or historical occurrences of this species have been recorded within 5-miles of the Project area. There is one recorded occurrence of this species from 2011 within the twelve 7.5-minute quadrangles surrounding the Project, but >5-miles from the Project area (CDFW 2017a).

Table B-2. Potentially Occurring Special Status Wildlife Species

Scientific Name	Common Name	Listing Status	Habitat Conditions	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
Fish					
<i>Catostomus santaanae</i>	Santa Ana sucker	FT	Endemic to Los Angeles Basin south coastal streams. Habitat generalists, but prefer sand-rubble-boulder bottoms, cool, clear water, and algae.	KNOWN (United 2004c)	The Project area and vicinity contains appropriate habitat. This species was observed in lower Piru Creek during surveys conducted in 2003 (United 2004c). These species are also known to occupy Lake Piru Reservoir and Piru Creek upstream of the reservoir (United 2004c).
<i>Gasterosteus aculeatus williamsoni</i>	Unarmored threespine stickleback	FE/SE/CFP	Weedy pools, backwaters, and among emergent vegetation at the stream edge in small Southern California streams. Cool (<24 °C), clear water with abundant vegetation.	NONE. Suitable habitat for this species does not exist within the Project area.	Appropriate habitat for this species (weedy pools, back waters, cool water) does not exist in the Project area or vicinity. No current or historical occurrences of this species have been recorded within 5-miles of the Project area.
<i>Gila orcuttii</i>	Arroyo chub	CSSC	Native to streams from Malibu Creek to San Luis Rey River basin. Introduced into streams in Santa Clara, Ventura, Santa Ynez, Mohave and San Diego River basins. Slow water stream sections with mud or sand bottoms. Feeds heavily on aquatic vegetation and associated invertebrates.	KNOWN (United 2004c, 2015c and 2016c)	The Project area and vicinity contains appropriate habitat including slow moving streams. This species was observed in lower Piru Creek during surveys conducted in 2003 and is known to occupy Lake Piru Reservoir and Piru Creek upstream of the reservoir (United 2004c). It was observed during 2015 and 2016 lower Piru Creek snorkel surveys (United 2015c, 2016c).
<i>Oncorhynchus mykiss irideus</i>	Steelhead - southern California DPS	FE	Federal listing refers to populations from Santa Maria River south to southern extent of range (San Mateo Creek in San Diego County). Southern steelhead likely have greater physiological tolerances to warmer water and more variable conditions.	KNOWN (United 2004c, 2015c and 2016c)	The Project area and vicinity contains critical habitat for the species. O. mykiss have been observed within lower Piru Creek during surveys conducted in 2003 and during 2015 and 2016 snorkel surveys (United 2004c, 2015c, 2016b).
Amphibians and Reptiles					
<i>Anaxyrus californicus</i>	Arroyo toad	FE/CSSC	Semi-arid regions near washes or intermittent streams, including valley-foothill and desert riparian, desert wash, etc. Rivers with sandy banks, willows, cottonwoods, and sycamores; loose, gravelly areas of streams in drier parts of range.	LOW. Low potential to occur based on current distribution of the species.	The Project area contains suitable habitat. There are no current occurrences of this species within the Project area. This species has been observed in the Project vicinity: in Piru Creek at Blue Point Campground upstream for 3.5 miles to Lower Piru Gorge (Untied 2004).

Table B-2. Potentially Occurring Special Status Wildlife Species

Scientific Name	Common Name	Listing Status	Habitat Conditions	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
<i>Arizona elegans occidentalis</i>	California glossy snake	CSSC	Patchily distributed from the eastern portion of San Francisco Bay, southern San Joaquin Valley, and the Coast, Transverse, and Peninsular Ranges, south to Baja California. Generalist reported from a range of scrub and grassland habitats, often with loose or sandy soils.	MOD. Moderate potential to occur based on available habitat and known range.	The Project area and vicinity contains appropriate habitat including scrub and grasslands with loose, sandy soil. No current or historical occurrences of this species have been recorded within 5-miles of the Project area. There are 6 recorded occurrences of this species from 1931-1995 within the twelve 7.5-minute quadrangles surrounding the Project, but >5-miles from the Project area (CDFW 2017a).
<i>Aspidoscelis tigris stejnegeri</i>	Coastal whiptail (=San Diego tiger whiptail)	CSSC	Found in deserts and semiarid areas with sparse vegetation and open areas. Also found in woodland and riparian areas. Ground may be firm soil, sandy, or rocky.	KNOWN. This species is known to occur in the Project vicinity and was observed in 2004 (Project vicinity) and 2016 (Project area) (BRC 2016, Greaves 2004).	The Project area contains appropriate habitat including open areas, areas with sparse vegetation, and riparian areas. Occurrences include a 2009 observation of two adults near the town of Piru approximately 3.4 miles from the Project area (CDFW 2017a).
<i>Emys marmorata</i> (=Actinemys pallida)	Western pond turtle (=Southern western pond turtle)	CSSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6,000 feet elevation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	KNOWN (United 2004b; 2015, 2016b)	The Project area contains suitable habitat including ponds, aquatic vegetation, and grassy open areas for egg-laying. The species has been observed in the spillway ponds during annual herpatological monitoring. Most recently, three males were observed in the spillway ponds immediately below Santa Felicia Dam in 2016 (United 2016b).
<i>Phrynosoma blainvillii</i>	Blainville's horned lizard	CSSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	KNOWN. This species was observed in the Project vicinity in 2004 (Greaves 2004).	The Project area contains appropriate habitat including lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects. This species was observed in the vicinity of the Project during a 2003 survey (Greaves 2004). Two individuals were recorded near Blue Point Campground (~4.4 miles north of the Project area) in 2016; one adult observed in Hopper Canyon in 2008 (4.9 miles southwest); one adult recorded in 2010 at the Santa Clara River (4.6 miles south) (CDFW 2017a).

Table B-2. Potentially Occurring Special Status Wildlife Species

Scientific Name	Common Name	Listing Status	Habitat Conditions	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
<i>Rana boylei</i>	Foothill yellow-legged frog	CSSC	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Need at least some cobble-sized substrate for egg-laying. Need at least 15 weeks to attain metamorphosis.	NONE. No potential to occur based on current distribution of the species	Appropriate habitat for this species is present in the Project area but is outside species known range. No current or historical occurrences of this species have been recorded within 5-miles of the Project area.
<i>Rana draytonii</i>	California red-legged frog	FT/CSSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	LOW. Low potential to occur based on current distribution of the species.	Appropriate habitat for this species is present in the Project area (i.e., foothills near deep water and riparian vegetation). There are no current occurrences of this species within the Project area. This species was historically (1940-1983) documented in Piru Creek from above the confluence of Aqua Blanca Creek, along the Lake Piru shoreline, and approximately a mile from Lake Piru on Piru Creek (United 2004).
<i>Salvadora hexalepis virgultea</i>	Coast patch-nosed snake	CSSC	Brushy or shrubby vegetation in coastal Southern California. Requires small mammal burrows for refuge and overwintering sites.	MOD. Moderate potential to occur based on available habitat and known range.	Appropriate habitat for this species is present in the Project area (i.e., shrubs, small mammal burrows, etc.). Documented occurrences of this species include a 2008 observation at Hopper Creek approximately 5 miles from the Project area (CDFW 2017a).
<i>Spea hammondi</i>	Western spadefoot	CSSC	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.	MOD. Moderate potential to occur based on available habitat.	Only marginal habitat (i.e., grasslands) available within the Project area. However, suitable habitat is present in the vicinity.
<i>Taricha torosa</i>	Coast Range newt	CSSC	Coastal drainages from Mendocino County to San Diego County. Lives in terrestrial habitats and will migrate over 1 km to breed in ponds, reservoirs and slow moving streams.	NONE. No potential to occur based on current distribution of the species.	Appropriate habitat for this species is present in the Project area but is outside species known range. No current or historical occurrences of this species have been recorded within 5-miles of the Project area.
<i>Thamnophis hammondi</i>	Two-striped gartersnake	CSSC	Coastal California from vicinity of Salinas to northwest Baja California. From sea to about 7,000 feet elevation. Highly aquatic, found in or near permanent fresh water. Often along streams with rocky beds and riparian growth.	KNOWN. (United 2004b; 2016)	Appropriate habitat for this species is present in the Project area (i.e., freshwater ponds, stream, riparian). The species has been observed in and near the spillway ponds during annual herpatological monitoring. Most recently, one individual was observed on land adjacent to the spillway ponds during 2016 annual herpatological monitoring (United 2016).

Table B-2. Potentially Occurring Special Status Wildlife Species

Scientific Name	Common Name	Listing Status	Habitat Conditions	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
Birds					
<i>Ammodramus savannarum</i>	Grasshopper sparrow	CSSC	Dense grasslands on rolling hills, lowland plains, in valleys and on hillsides on lower mountain slopes. Favors native grasslands with a mix of grasses, forbs and scattered shrubs. Loosely colonial when nesting.	LOW. Marginal habitat available in the Project vicinity, but no suitable habitat within the Project area.	Appropriate habitat for this species is present in the Project area (grasslands, shrubs, etc.). No current or historical occurrences of this species have been recorded within 5-miles of the Project area. There are no recorded occurrences of this species from the twelve 7.5-minute quadrangles surrounding the Project, but >5-miles from the Project area (CDFW 2017a).
<i>Athene cunicularia</i>	Burrowing owl	CSSC	Open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	MOD. Moderate potential to occur based on available habitat and known range.	This species was listed as a trust resource in an IPaC query of the Piru area (USFWS 2017a). Appropriate habitat for this species is present in the Project area (i.e., annual grasslands, ground squirrels). Recorded occurrences for this species include a 2007 observation from the Santa Clara River located approximately 4.8 miles from the Project area (CDFW 2017a).
<i>Buteo swainsoni</i>	Swainson's hawk	ST	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	LOW. Low potential to occur based on available habitat and known range.	Appropriate habitat for this species is present in the Project area (grasslands, scattered trees, riparian areas, agricultural or ranch land, etc.). No current or historical occurrences of this species have been recorded within 5-miles of the Project area. There are 2 recorded occurrences of this species from 1898 within the twelve 7.5-minute quadrangles surrounding the Project, but >5-miles from the Project area (CDFW 2017a).

Table B-2. Potentially Occurring Special Status Wildlife Species

Scientific Name	Common Name	Listing Status	Habitat Conditions	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
<i>Coccyzus americanus occidentalis</i>	Western yellow-billed cuckoo	FT/SE	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems. Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.	LOW. Low potential to occur based on current distribution of the species, and low suitability of available riparian habitat.	<p>Appropriate habitat for this species is present in the Project area (i.e., riparian woodland).</p> <p>However, this species has been well documented in the region and currently has a very limited range and very specific habitat requirements (i.e., large expanses of riparian jungle with perennial water) that are not present in the Project area or vicinity (Griffith 2016).</p> <p>A historical occurrence from 1979 is recorded in the Santa Clara River, approximately 3-4 miles east of Piru (CDFW 2017a).</p> <p>There is one additional recorded occurrences of this species from 1924 within the twelve 7.5-minute quadrangles surrounding the Project, but >5-miles from the Project area (CDFW 2017a).</p>
<i>Elanus leucurus</i>	White-tailed kite	CFP	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	MOD. Moderate potential to occur based on available habitat and known range.	<p>Suitable habitat for this species is present in the Project area (river bottoms, deciduous woodland, grasslands, dense-topped trees, etc.).</p> <p>No current or historical occurrences of this species have been recorded within 5-miles of the Project area. There are 3 recorded occurrences of this species from 2005, 2009 and 2011 within the twelve 7.5-minute quadrangles surrounding the Project, but >5-miles from the Project area (CDFW 2017a).</p>

Table B-2. Potentially Occurring Special Status Wildlife Species

Scientific Name	Common Name	Listing Status	Habitat Conditions	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
<i>Empidonax traillii extimus</i>	Southwestern willow flycatcher	FE/SE	Riparian woodlands in Southern California.	HIGH. This species was observed in the Project vicinity as a transient visitor in 2016, and is known to nest in the Santa Clara River (Griffith 2016).	This species was listed as a trust resource in an IPaC query of the Piru area (USFWS 2017a). Suitable habitat for this species is present in the Project area (i.e., riparian woodlands). This species was observed in the Project vicinity as a transient visitor in 2016, and is known to nest in the Santa Clara River (Griffith 2016). There are 2 additional recorded occurrences of this species from 2007 and 2009 within the twelve 7.5-minute quadrangles surrounding the Project, but >5-miles from the Project area (CDFW 2017a).
<i>Gymnogyps californianus</i>	California condor	FE/SE/CFP	Require vast expanses of open savannah, grasslands, and foothill chaparral in mountain ranges of moderate altitude. Deep canyons containing clefts in the rocky walls provide nesting sites. Forages up to 100 miles from roost/nest.	HIGH potential to occur as a transient visitor based on known range and observations in the Project vicinity (Griffith 2016). Suitable nesting habitat not available within the Project area or vicinity	This species was listed as a trust resource in an IPaC query of the Piru area (USFWS 2017a). Suitable nesting habitat for this species is not present within the Project area, however the species is known from the region and is capable of foraging long distances. This species has a high potential to occur as a transient visitor. There are known occurrences within the Project area (spillway channel) from 2016 (CDFW 2017a, Griffith 2016).
<i>Icteria virens</i>	Yellow-breasted chat	CSSC	Summer resident; inhabits riparian thickets of willow and other brushy tangles near watercourses. Nests in low, dense riparian, consisting of willow, blackberry, wild grape; forages and nests within 10 ft of ground.	KNOWN. This species is known to occur in the Project vicinity and was detected in 2004 and 2016 (Greaves 2004, Griffith 2016).	Suitable habitat for this species is available in the Project area and vicinity (i.e., riparian thickets). This species has been observed in the Project area and/or vicinity in 2004 and 2016 (Greaves 2004, Griffith Wildlife Biology 2016). Additional occurrences within 5-miles of the Project area have been recorded at the Santa Clara River approximately 3-4 miles east of Piru (CDFW 2017a).

Table B-2. Potentially Occurring Special Status Wildlife Species

Scientific Name	Common Name	Listing Status	Habitat Conditions	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
<i>Lanius ludovicianus</i>	Loggerhead shrike	CSSC	Broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub and washes. Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.	HIGH. High potential to occur based on available habitat and known range.	This species was listed as a trust resource in an IPaC query of the Piru area (USFWS 2017a). Suitable habitat for this species is present in the Project area and vicinity (i.e., woodlands, scrub, washes). No current or historical occurrences of this species have been recorded within 5-miles of the Project area. There are 4 recorded occurrences of this species from 2005, 2006 and 2008 within the twelve 7.5-minute quadrangles surrounding the Project, but >5-miles from the Project area (CDFW 2017a).
<i>Polioptila californica</i>	Coastal California gnatcatcher	FT/CSSC	Obligate, permanent resident of coastal sage scrub below 2,500 ft in Southern California. Low, coastal sage scrub in arid washes, on mesas and slopes. Not all areas classified as coastal sage scrub are occupied.	MOD. Moderate potential to occur based on available habitat and known range.	This species was listed as a trust resource in an IPaC query of the Piru area (USFWS 2017a). Coastal sage scrub habitat within the Project area is marginal, however, suitable sage scrub habitat can be found in the Project vicinity. No current or historical occurrences of this species have been recorded within 5-miles of the Project area. There are 9 recorded occurrences of this species from 1995-2015 within the twelve 7.5-minute quadrangles surrounding the Project, but >5-miles from the Project area (CDFW 2017a).
<i>Riparia riparia</i>	Bank swallow	ST	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	LOW potential to occur based on lack of suitable habitat in the Project area.	The specific environmental conditions needed to support this species (i.e., vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole) does not exist in the Project area or vicinity. No current or historical occurrences of this species have been recorded within 5-miles of the Project area. There are 2 recorded occurrences of this species from pre-1926 within the twelve 7.5-minute quadrangles surrounding the Project, but >5-miles from the Project area (CDFW 2017a).

Table B-2. Potentially Occurring Special Status Wildlife Species

Scientific Name	Common Name	Listing Status	Habitat Conditions	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
<i>Setophaga petechia</i>	Yellow warbler	CSSC	Riparian plant associations in close proximity to water. Also nests in montane shrubbery in open conifer forests in Cascades and Sierra Nevada. Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders.	KNOWN. This species is known to occur in the Project area (Griffith 2016).	This species was listed as a trust resource in an IPaC query of the Piru area (USFWS 2017a). Suitable habitat for this species is available in the Project area and vicinity (i.e., riparian, water). This species has been recently observed in the Project area and vicinity (Griffith 2016). Historical occurrences of yellow warbler from 1979 are recorded in the Santa Clara River, approximately 3-4 miles east of Piru (CDFW 2017a).
<i>Vireo bellii pusillus</i>	Least Bell's vireo	FE/SE	Summer resident of Southern California in low riparian in vicinity of water or in dry river bottoms; below 2,000 feet. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, <i>Baccharis</i> , mesquite.	KNOWN. This species is known to occur in the Project area and has been known to nest in riparian habitat in the spillway and tailrace channels (Griffith 2016).	This species was listed as a trust resource in an IPaC query of the Piru area (USFWS 2017a). Suitable habitat for this species is available in the Project area and vicinity (i.e., riparian). This species has been recently observed in the Project area and vicinity (Griffith 2016). Historical occurrences within 5-miles of the Project area include a multiple individuals recorded in 1979, 1999, 2000, 2001, 2004, 2005, 2006, and 2007 at a location approximately 6 miles southeast of Piru on the Santa Clara River (CDFW 2016).
Mammals					
<i>Antrozous pallidus</i>	Pallid bat	CSS	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	MOD. Moderate potential to occur based on available habitat and known range.	Only marginal habitat (grasslands, shrublands, woodlands, etc.) available within the Project area. However suitable habitat and potential roosting sites are present in the vicinity. There are two recorded occurrences of this species from 1938 and 1942 within the twelve 7.5-minute quadrangles surrounding the Project, but >5-miles from the Project area.

Table B-2. Potentially Occurring Special Status Wildlife Species

Scientific Name	Common Name	Listing Status	Habitat Conditions	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
<i>Euderma maculatum</i>	Spotted bat	CSSC	Occupies a wide variety of habitats from arid deserts and grasslands through mixed conifer forests. Feeds over water and along washes. Feeds almost entirely on moths. Needs rock crevices in cliffs or caves for roosting.	LOW. Moderate potential to occur based on available habitat and known range.	Only marginal habitat (i.e., grasslands, etc.) available within the Project area. However suitable habitat and potential roosting sites are present in the vicinity. There is one recorded occurrence of this species from 1890 within the twelve 7.5-minute quadrangles surrounding the Project, but >5-miles from the Project area.
<i>Eumops perotis californicus</i>	Western mastiff bat	CSSC	Many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral etc. Roosts in crevices in cliff faces, high buildings, trees and tunnels.	MOD. Moderate potential to occur based on available habitat and known range.	Suitable habitat and roosting sites (coastal scrub, grasslands, chaparral, high buildings, etc.) are available within the Project area and vicinity. Occurrences within 5-miles of the Project area (approximately 1.2 miles south of Blue Point Campground) were recorded in 1992 (CDFW 2017a).
<i>Lepus californicus bennettii</i>	San Diego black-tailed jackrabbit	CSSC	Intermediate canopy stages of shrub habitats and open shrub / herbaceous and tree / herbaceous edges. Coastal sage scrub habitats in Southern California.	MOD. Moderate potential to occur based on available habitat and known range.	Only marginal habitat (i.e., coastal sage scrub) available within the Project area. However suitable habitat is present in the vicinity. No current or historical occurrences of this species have been recorded within 5-miles of the Project area. There is one recorded occurrences of this species from 2005 within the twelve 7.5-minute quadrangles surrounding the Project, but >5-miles from the Project area (CDFW 2017a).
<i>Macrotus californicus</i>	California leaf-nosed bat	CSSC	Desert riparian, desert wash, desert scrub, desert succulent scrub, alkali scrub and palm oasis habitats. Needs rocky, rugged terrain with mines or caves for roosting.	LOW. Low potential to occur based on lack of suitable habitat in the Project area.	Suitable habitat (i.e., desert riparian, desert wash, desert scrub, desert succulent scrub, alkali scrub and palm oasis habitats) for this species is not present in the Project area or vicinity. No current or historical occurrences of this species have been recorded within 5-miles of the Project area. There is one recorded occurrences of this species from 1950 within the twelve 7.5-minute quadrangles surrounding the Project, but >5-miles from the Project area (CDFW 2017a).

Table B-2. Potentially Occurring Special Status Wildlife Species

Scientific Name	Common Name	Listing Status	Habitat Conditions	Potential to Occur in the Project Area	Reasoning for Potential to Occur Determination
<i>Neotoma lepida intermedia</i>	San Diego desert woodrat	CSSC	Coastal scrub of Southern California from San Diego County to San Luis Obispo County. Moderate to dense canopies preferred. They are particularly abundant in rock outcrops and rocky cliffs and slopes.	MOD. Moderate potential to occur based on available habitat and known range.	Only marginal habitat (i.e., coastal sage scrub) available within the Project area. However suitable habitat is present in the vicinity. No current or historical occurrences of this species have been recorded within 5-miles of the Project area. There are 8 recorded occurrences of this species from 1992 within the twelve 7.5-minute quadrangles surrounding the Project, but >5-miles from the Project area (CDFW 2017a).
<i>Taxidea taxus</i>	American badger	CSSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	MOD. Moderate potential to occur based on available habitat and known range.	Suitable habitat for this species is available in the Project area and vicinity (i.e., scrub, forest, herbaceous habitats with friable soils and burrowing animals). No current or historical occurrences of this species have been recorded within 5-miles of the Project area. There are 3 recorded occurrences of this species from 1991, 2015 and 2016 within the twelve 7.5-minute quadrangles surrounding the Project, but >5-miles from the Project area (CDFW 2017a).
<p>Sources: CDFW 2017a, Greaves 2004, Griffith Wildlife Biology 2016</p> <p>Listing Status Codes:</p> <p>FC Federal Candidate FE Federal Endangered FT Federal Threatened CFP California Fully Protected SCT State Candidate Threatened SE State Endangered ST State Threatened CSSC CA Species of Special Concern CFP CA Fully Protected Species</p>					

Final Environmental Impact Report
Santa Felicia Dam Safety
Improvement Project

APPENDIX

C

SUMMARY OF GREENHOUSE GAS
EMISSIONS DATA

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Annual

Santa Felicia Dam Outlet Works Alt 1
Ventura County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	36.59	1000sqft	0.84	36,590.40	0
Other Asphalt Surfaces	0.70	Acre	0.70	30,492.00	0
Other Non-Asphalt Surfaces	2.83	Acre	2.83	123,274.80	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Annual

Project Characteristics - !

Land Use - Acreage based on Constructability Analysis figures.

Construction Phase - Schedule based on Constructability Analysis, Table 3-1.

Off-road Equipment - Concrete Pump Truck, Water Truck, and Flatbed= Off-highway Truck.

Trips and VMT - Trip counts based on info in the Constructability Analysis report. It is assumed that workers and vendors will be coming from the cities of Castaic and Santa Clarita, approximately 20 miles to the east.

Grading -

Area Coating -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	18295	87120
tblAreaCoating	Area_Nonresidential_Interior	54886	261360
tblAreaCoating	Area_Parking	9226	1045
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblLandUse	BuildingSpaceSquareFeet	36,590.00	36,590.40
tblLandUse	LandUseSquareFeet	36,590.00	36,590.40
tblOffRoadEquipment	HorsePower	124.00	46.00
tblOffRoadEquipment	LoadFactor	0.44	0.45
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

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tblTripsAndVMT	WorkerTripNumber	25.00	24.00
tblTripsAndVMT	WorkerTripNumber	25.00	24.00
tblTripsAndVMT	WorkerTripNumber	23.00	24.00
tblTripsAndVMT	WorkerTripNumber	15.00	20.00
tblTripsAndVMT	WorkerTripNumber	8.00	12.00
tblTripsAndVMT	WorkerTripNumber	80.00	24.00
tblTripsAndVMT	WorkerTripNumber	80.00	24.00
tblTripsAndVMT	WorkerTripNumber	3.00	8.00

2.0 Emissions Summary

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Annual

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2797	2.8510	2.0865	5.0600e-003							0.0000	455.3669	455.3669	0.0977	0.0000	457.8095
2020	0.6287	6.2284	4.6590	0.0129							0.0000	1,152.0193	1,152.0193	0.2396	0.0000	1,158.0102
2021	0.3303	3.0925	2.5366	7.5200e-003							0.0000	671.2712	671.2712	0.1558	0.0000	675.1656
Maximum	0.6287	6.2284	4.6590	0.0129							0.0000	1,152.0193	1,152.0193	0.2396	0.0000	1,158.0102

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2797	2.8510	2.0865	5.0600e-003							0.0000	455.3665	455.3665	0.0977	0.0000	457.8091
2020	0.6287	6.2284	4.6590	0.0129							0.0000	1,152.0183	1,152.0183	0.2396	0.0000	1,158.0092
2021	0.3303	3.0925	2.5366	7.5200e-003							0.0000	671.2706	671.2706	0.1558	0.0000	675.1650
Maximum	0.6287	6.2284	4.6590	0.0129							0.0000	1,152.0183	1,152.0183	0.2396	0.0000	1,158.0092

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Annual

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	8-1-2019	10-31-2019	1.0112	1.0112
2	11-1-2019	1-31-2020	2.0630	2.0630
3	2-1-2020	4-30-2020	1.2719	1.2719
4	5-1-2020	7-31-2020	0.8570	0.8570
5	8-1-2020	10-31-2020	2.1960	2.1960
6	11-1-2020	1-31-2021	2.6277	2.6277
7	2-1-2021	4-30-2021	1.9107	1.9107
8	5-1-2021	7-31-2021	0.7115	0.7115
		Highest	2.6277	2.6277

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Annual

2.2 Overall Operational
Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3554	0.0000	3.7000e-004	0.0000							0.0000	7.2000e-004	7.2000e-004	0.0000	0.0000	7.6000e-004
Energy	4.1400e-003	0.0376	0.0316	2.3000e-004							0.0000	141.4422	141.4422	4.9300e-003	1.6100e-003	142.0451
Mobile	0.0583	0.2682	0.8527	3.0500e-003							0.0000	279.7181	279.7181	0.0111	0.0000	279.9958
Waste											9.2097	0.0000	9.2097	0.5443	0.0000	22.8166
Water											2.6844	35.1046	37.7890	0.2772	6.8100e-003	46.7475
Total	0.4179	0.3058	0.8847	3.2800e-003							11.8941	456.2656	468.1597	0.8375	8.4200e-003	491.6058

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Annual

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3554	0.0000	3.7000e-004	0.0000							0.0000	7.2000e-004	7.2000e-004	0.0000	0.0000	7.6000e-004
Energy	4.1400e-003	0.0376	0.0316	2.3000e-004							0.0000	141.4422	141.4422	4.9300e-003	1.6100e-003	142.0451
Mobile	0.0583	0.2682	0.8527	3.0500e-003							0.0000	279.7181	279.7181	0.0111	0.0000	279.9958
Waste											9.2097	0.0000	9.2097	0.5443	0.0000	22.8166
Water											2.6844	35.1046	37.7890	0.2772	6.8100e-003	46.7475
Total	0.4179	0.3058	0.8847	3.2800e-003							11.8941	456.2656	468.1597	0.8375	8.4200e-003	491.6058

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Santa Felicia Dam Outlet Works Alt 1 - Ventura County, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation - Mobilization	Site Preparation	8/1/2019	8/31/2019	5	22	
2	Grading - Access Roads and Pad	Grading	9/1/2019	2/29/2020	5	130	
3	Trenchin - Intake Facility Excavation	Trenching	11/1/2019	12/31/2019	5	43	
4	Trenching - Tunnel Excavation	Trenching	11/1/2019	4/30/2020	5	130	
5	Trenching - Tunnel Pipe Install	Trenching	5/1/2020	8/31/2020	5	87	
6	Trenching - Downstream Facility Excavation	Trenching	8/1/2020	8/31/2020	5	21	
7	Building Construction - Inclined Intake Facility Components	Building Construction	9/1/2020	3/31/2021	5	152	
8	Building Construction - Downstream Facility Components	Building Construction	9/1/2020	4/30/2021	5	174	
9	Demolition - Remove Intake Facility Cofferdam	Demolition	12/1/2020	12/31/2020	5	23	
10	Demolition - Abandon Existing Outlet Works	Demolition	5/1/2021	6/30/2021	5	43	
11	Site Preparation - Demobilization	Site Preparation	7/1/2021	7/30/2021	5	22	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 3.53

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation - Mobilization	Air Compressors	0	6.00	78	0.48
Site Preparation - Mobilization	Excavators	1	4.00	158	0.38
Site Preparation - Mobilization	Generator Sets	1	4.00	84	0.74
Site Preparation - Mobilization	Graders	1	4.00	187	0.41

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Site Preparation - Mobilization	Off-Highway Trucks	2	8.00	402	0.38
Site Preparation - Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation - Mobilization	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Site Preparation - Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading - Access Roads and Pad	Cranes	0	7.00	231	0.29
Grading - Access Roads and Pad	Dumpers/Tenders	1	8.00	16	0.38
Grading - Access Roads and Pad	Excavators	1	4.00	158	0.38
Grading - Access Roads and Pad	Forklifts	0	8.00	89	0.20
Grading - Access Roads and Pad	Generator Sets	1	8.00	84	0.74
Grading - Access Roads and Pad	Graders	1	8.00	187	0.41
Grading - Access Roads and Pad	Off-Highway Tractors	2	4.00	46	0.45
Grading - Access Roads and Pad	Off-Highway Trucks	1	8.00	402	0.38
Grading - Access Roads and Pad	Rubber Tired Dozers	0	8.00	247	0.40
Grading - Access Roads and Pad	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Trenchin - Intake Facility Excavation	Aerial Lifts	1	8.00	63	0.31
Trenchin - Intake Facility Excavation	Concrete/Industrial Saws	0	8.00	81	0.73
Trenchin - Intake Facility Excavation	Cranes	1	4.00	231	0.29
Trenchin - Intake Facility Excavation	Dumpers/Tenders	2	8.00	16	0.38
Trenchin - Intake Facility Excavation	Excavators	1	8.00	158	0.38
Trenchin - Intake Facility Excavation	Generator Sets	2	8.00	84	0.74
Trenchin - Intake Facility Excavation	Off-Highway Trucks	1	8.00	402	0.38
Trenchin - Intake Facility Excavation	Rubber Tired Dozers	0	8.00	247	0.40
Trenchin - Intake Facility Excavation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching - Tunnel Excavation	Aerial Lifts	1	4.00	63	0.31
Trenching - Tunnel Excavation	Bore/Drill Rigs	1	8.00	221	0.50
Trenching - Tunnel Excavation	Crawler Tractors	1	8.00	212	0.43
Trenching - Tunnel Excavation	Crushing/Proc. Equipment	1	8.00	85	0.78

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Trenching - Tunnel Excavation	Dumpers/Tenders	1	8.00	16	0.38
Trenching - Tunnel Excavation	Excavators	1	8.00	158	0.38
Trenching - Tunnel Excavation	Generator Sets	1	8.00	84	0.74
Trenching - Tunnel Excavation	Graders	0	8.00	187	0.41
Trenching - Tunnel Excavation	Rubber Tired Dozers	0	8.00	247	0.40
Trenching - Tunnel Excavation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching - Tunnel Pipe Install	Cement and Mortar Mixers	0	6.00	9	0.56
Trenching - Tunnel Pipe Install	Crawler Tractors	1	4.00	212	0.43
Trenching - Tunnel Pipe Install	Generator Sets	1	8.00	84	0.74
Trenching - Tunnel Pipe Install	Off-Highway Trucks	1	6.00	402	0.38
Trenching - Tunnel Pipe Install	Pavers	0	8.00	130	0.42
Trenching - Tunnel Pipe Install	Paving Equipment	0	6.00	132	0.36
Trenching - Tunnel Pipe Install	Rollers	0	6.00	80	0.38
Trenching - Tunnel Pipe Install	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Trenching - Tunnel Pipe Install	Welders	2	8.00	46	0.45
Trenching - Downstream Facility Excavation	Dumpers/Tenders	1	8.00	16	0.38
Trenching - Downstream Facility Excavation	Excavators	1	8.00	158	0.38
Trenching - Downstream Facility Excavation	Off-Highway Trucks	1	8.00	402	0.38
Trenching - Downstream Facility Excavation	Rubber Tired Dozers	0	8.00	247	0.40
Trenching - Downstream Facility Excavation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction - Inclined Intake Facility Components	Aerial Lifts	1	4.00	63	0.31
Building Construction - Inclined Intake Facility Components	Air Compressors	1	8.00	78	0.48
Building Construction - Inclined Intake Facility Components	Cranes	1	4.00	231	0.29
Building Construction - Inclined Intake Facility Components	Forklifts	0	8.00	89	0.20
Building Construction - Inclined Intake Facility Components	Generator Sets	1	8.00	84	0.74

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Building Construction - Inclined Intake Facility Components	Off-Highway Tractors	1	8.00	124	0.44
Building Construction - Inclined Intake Facility Components	Off-Highway Trucks	3	8.00	402	0.38
Building Construction - Inclined Intake Facility Components	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Building Construction - Inclined Intake Facility Components	Welders	0	8.00	46	0.45
Building Construction - Downstream Facility Components	Air Compressors	1	8.00	78	0.48
Building Construction - Downstream Facility Components	Cranes	0	7.00	231	0.29
Building Construction - Downstream Facility Components	Cranes	1	4.00	231	0.29
Building Construction - Downstream Facility Components	Forklifts	0	8.00	89	0.20
Building Construction - Downstream Facility Components	Generator Sets	1	8.00	84	0.74
Building Construction - Downstream Facility Components	Off-Highway Tractors	1	8.00	124	0.44
Building Construction - Downstream Facility Components	Off-Highway Trucks	1	4.00	402	0.38
Building Construction - Downstream Facility Components	Off-Highway Trucks	2	8.00	402	0.38
Building Construction - Downstream Facility Components	Pavers	1	8.00	130	0.42
Building Construction - Downstream Facility Components	Rollers	1	8.00	80	0.38
Building Construction - Downstream Facility Components	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction - Downstream Facility Components	Welders	1	4.00	46	0.45
Demolition - Remove Intake Facility Cofferdam	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition - Remove Intake Facility Cofferdam	Excavators	1	8.00	158	0.38
Demolition - Remove Intake Facility Cofferdam	Rubber Tired Dozers	0	8.00	247	0.40
Demolition - Abandon Existing Outlet Works	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition - Abandon Existing Outlet Works	Dumpers/Tenders	1	8.00	16	0.38
Demolition - Abandon Existing Outlet Works	Excavators	0	8.00	158	0.38

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Demolition - Abandon Existing Outlet Works	Off-Highway Trucks	1	4.00	402	0.38
Demolition - Abandon Existing Outlet Works	Off-Highway Trucks	2	8.00	402	0.38
Demolition - Abandon Existing Outlet Works	Rubber Tired Dozers	0	8.00	247	0.40
Demolition - Abandon Existing Outlet Works	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation - Demobilization	Dumpers/Tenders	1	8.00	16	0.38
Site Preparation - Demobilization	Excavators	1	8.00	158	0.38
Site Preparation - Demobilization	Off-Highway Trucks	2	8.00	402	0.38
Site Preparation - Demobilization	Pavers	1	8.00	130	0.42
Site Preparation - Demobilization	Rollers	1	8.00	80	0.38
Site Preparation - Demobilization	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation - Demobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation - Mobilization	7	20.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading - Access Roads and Pad	10	24.00	11.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenchin - Intake Facility Excavation	10	24.00	17.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Tunnel Excavation	9	24.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Tunnel Pipe Install	6	20.00	40.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Downstream Facility Excavation	3	12.00	2.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction - Inclined Intake Facility	9	24.00	24.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction - Downstream Facility Construction	11	24.00	18.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demolition - Remove Intake Facility Cofferdam	1	8.00	5.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demolition - Abandon Existing Outlet Works	5	20.00	20.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation - Demobilization	7	24.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT

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3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - Mobilization - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0260	0.2685	0.1745	4.4000e-004							0.0000	39.6434	39.6434	0.0118	0.0000	39.9373
Total	0.0260	0.2685	0.1745	4.4000e-004							0.0000	39.6434	39.6434	0.0118	0.0000	39.9373

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3.2 Site Preparation - Mobilization - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.3000e-004	0.0220	5.7400e-003	6.0000e-005							0.0000	5.9805	5.9805	3.9000e-004	0.0000	5.9904
Worker	1.4100e-003	1.0600e-003	0.0109	3.0000e-005							0.0000	2.8671	2.8671	8.0000e-005	0.0000	2.8691
Total	2.2400e-003	0.0231	0.0166	9.0000e-005							0.0000	8.8477	8.8477	4.7000e-004	0.0000	8.8595

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0260	0.2685	0.1745	4.4000e-004							0.0000	39.6434	39.6434	0.0118	0.0000	39.9373
Total	0.0260	0.2685	0.1745	4.4000e-004							0.0000	39.6434	39.6434	0.0118	0.0000	39.9373

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3.2 Site Preparation - Mobilization - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.3000e-004	0.0220	5.7400e-003	6.0000e-005							0.0000	5.9805	5.9805	3.9000e-004	0.0000	5.9904
Worker	1.4100e-003	1.0600e-003	0.0109	3.0000e-005							0.0000	2.8671	2.8671	8.0000e-005	0.0000	2.8691
Total	2.2400e-003	0.0231	0.0166	9.0000e-005							0.0000	8.8477	8.8477	4.7000e-004	0.0000	8.8595

3.3 Grading - Access Roads and Pad - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1106	1.1469	0.7982	1.7000e-003							0.0000	151.0437	151.0437	0.0411	0.0000	152.0703
Total	0.1106	1.1469	0.7982	1.7000e-003							0.0000	151.0437	151.0437	0.0411	0.0000	152.0703

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3.3 Grading - Access Roads and Pad - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0100e-003	0.1065	0.0277	3.0000e-004							0.0000	28.9059	28.9059	1.9000e-003	0.0000	28.9534
Worker	6.7000e-003	5.0400e-003	0.0517	1.5000e-004							0.0000	13.6058	13.6058	3.8000e-004	0.0000	13.6153
Total	0.0107	0.1116	0.0794	4.5000e-004							0.0000	42.5117	42.5117	2.2800e-003	0.0000	42.5688

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1106	1.1469	0.7982	1.7000e-003							0.0000	151.0435	151.0435	0.0411	0.0000	152.0702
Total	0.1106	1.1469	0.7982	1.7000e-003							0.0000	151.0435	151.0435	0.0411	0.0000	152.0702

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3.3 Grading - Access Roads and Pad - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0100e-003	0.1065	0.0277	3.0000e-004							0.0000	28.9059	28.9059	1.9000e-003	0.0000	28.9534
Worker	6.7000e-003	5.0400e-003	0.0517	1.5000e-004							0.0000	13.6058	13.6058	3.8000e-004	0.0000	13.6153
Total	0.0107	0.1116	0.0794	4.5000e-004							0.0000	42.5117	42.5117	2.2800e-003	0.0000	42.5688

3.3 Grading - Access Roads and Pad - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0508	0.5184	0.3882	8.4000e-004							0.0000	73.2916	73.2916	0.0202	0.0000	73.7966
Total	0.0508	0.5184	0.3882	8.4000e-004							0.0000	73.2916	73.2916	0.0202	0.0000	73.7966

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3.3 Grading - Access Roads and Pad - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.5900e-003	0.0456	0.0122	1.5000e-004							0.0000	14.1871	14.1871	9.0000e-004	0.0000	14.2096
Worker	3.0800e-003	2.2300e-003	0.0233	7.0000e-005							0.0000	6.5120	6.5120	1.7000e-004	0.0000	6.5162
Total	4.6700e-003	0.0478	0.0354	2.2000e-004							0.0000	20.6991	20.6991	1.0700e-003	0.0000	20.7257

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0508	0.5184	0.3882	8.4000e-004							0.0000	73.2915	73.2915	0.0202	0.0000	73.7965
Total	0.0508	0.5184	0.3882	8.4000e-004							0.0000	73.2915	73.2915	0.0202	0.0000	73.7965

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3.3 Grading - Access Roads and Pad - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.5900e-003	0.0456	0.0122	1.5000e-004							0.0000	14.1871	14.1871	9.0000e-004	0.0000	14.2096
Worker	3.0800e-003	2.2300e-003	0.0233	7.0000e-005							0.0000	6.5120	6.5120	1.7000e-004	0.0000	6.5162
Total	4.6700e-003	0.0478	0.0354	2.2000e-004							0.0000	20.6991	20.6991	1.0700e-003	0.0000	20.7257

3.4 Trenchin - Intake Facility Excavation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0594	0.5744	0.4741	9.4000e-004							0.0000	82.9668	82.9668	0.0196	0.0000	83.4568
Total	0.0594	0.5744	0.4741	9.4000e-004							0.0000	82.9668	82.9668	0.0196	0.0000	83.4568

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3.4 Trenchin - Intake Facility Excavation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0600e-003	0.0814	0.0212	2.3000e-004							0.0000	22.0796	22.0796	1.4500e-003	0.0000	22.1160
Worker	3.3100e-003	2.4900e-003	0.0255	7.0000e-005							0.0000	6.7247	6.7247	1.9000e-004	0.0000	6.7294
Total	6.3700e-003	0.0839	0.0467	3.0000e-004							0.0000	28.8044	28.8044	1.6400e-003	0.0000	28.8454

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0594	0.5744	0.4741	9.4000e-004							0.0000	82.9667	82.9667	0.0196	0.0000	83.4567
Total	0.0594	0.5744	0.4741	9.4000e-004							0.0000	82.9667	82.9667	0.0196	0.0000	83.4567

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3.4 Trenchin - Intake Facility Excavation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0600e-003	0.0814	0.0212	2.3000e-004							0.0000	22.0796	22.0796	1.4500e-003	0.0000	22.1160
Worker	3.3100e-003	2.4900e-003	0.0255	7.0000e-005							0.0000	6.7247	6.7247	1.9000e-004	0.0000	6.7294
Total	6.3700e-003	0.0839	0.0467	3.0000e-004							0.0000	28.8044	28.8044	1.6400e-003	0.0000	28.8454

3.5 Trenching - Tunnel Excavation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0594	0.5971	0.4603	9.4000e-004							0.0000	83.1354	83.1354	0.0199	0.0000	83.6336
Total	0.0594	0.5971	0.4603	9.4000e-004							0.0000	83.1354	83.1354	0.0199	0.0000	83.6336

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3.5 Trenching - Tunnel Excavation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.6200e-003	0.0431	0.0112	1.2000e-004							0.0000	11.6892	11.6892	7.7000e-004	0.0000	11.7085
Worker	3.3100e-003	2.4900e-003	0.0255	7.0000e-005							0.0000	6.7247	6.7247	1.9000e-004	0.0000	6.7294
Total	4.9300e-003	0.0456	0.0368	1.9000e-004							0.0000	18.4139	18.4139	9.6000e-004	0.0000	18.4379

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0594	0.5971	0.4603	9.4000e-004							0.0000	83.1353	83.1353	0.0199	0.0000	83.6335
Total	0.0594	0.5971	0.4603	9.4000e-004							0.0000	83.1353	83.1353	0.0199	0.0000	83.6335

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3.5 Trenching - Tunnel Excavation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.6200e-003	0.0431	0.0112	1.2000e-004							0.0000	11.6892	11.6892	7.7000e-004	0.0000	11.7085
Worker	3.3100e-003	2.4900e-003	0.0255	7.0000e-005							0.0000	6.7247	6.7247	1.9000e-004	0.0000	6.7294
Total	4.9300e-003	0.0456	0.0368	1.9000e-004							0.0000	18.4139	18.4139	9.6000e-004	0.0000	18.4379

3.5 Trenching - Tunnel Excavation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1116	1.1161	0.9250	1.9100e-003							0.0000	165.8084	165.8084	0.0400	0.0000	166.8083
Total	0.1116	1.1161	0.9250	1.9100e-003							0.0000	165.8084	165.8084	0.0400	0.0000	166.8083

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3.5 Trenching - Tunnel Excavation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0755	0.0202	2.4000e-004							0.0000	23.4851	23.4851	1.4900e-003	0.0000	23.5224
Worker	6.2400e-003	4.5000e-003	0.0471	1.5000e-004							0.0000	13.1754	13.1754	3.4000e-004	0.0000	13.1839
Total	8.8800e-003	0.0800	0.0672	3.9000e-004							0.0000	36.6606	36.6606	1.8300e-003	0.0000	36.7063

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1116	1.1161	0.9250	1.9100e-003							0.0000	165.8082	165.8082	0.0400	0.0000	166.8081
Total	0.1116	1.1161	0.9250	1.9100e-003							0.0000	165.8082	165.8082	0.0400	0.0000	166.8081

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3.5 Trenching - Tunnel Excavation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0755	0.0202	2.4000e-004							0.0000	23.4851	23.4851	1.4900e-003	0.0000	23.5224
Worker	6.2400e-003	4.5000e-003	0.0471	1.5000e-004							0.0000	13.1754	13.1754	3.4000e-004	0.0000	13.1839
Total	8.8800e-003	0.0800	0.0672	3.9000e-004							0.0000	36.6606	36.6606	1.8300e-003	0.0000	36.7063

3.6 Trenching - Tunnel Pipe Install - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0859	0.7021	0.5432	1.1800e-003							0.0000	99.7429	99.7429	0.0228	0.0000	100.3133
Total	0.0859	0.7021	0.5432	1.1800e-003							0.0000	99.7429	99.7429	0.0228	0.0000	100.3133

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3.6 Trenching - Tunnel Pipe Install - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0117	0.3356	0.0895	1.0700e-003							0.0000	104.3784	104.3784	6.6200e-003	0.0000	104.5439
Worker	5.2000e-003	3.7500e-003	0.0392	1.2000e-004							0.0000	10.9795	10.9795	2.8000e-004	0.0000	10.9866
Total	0.0169	0.3393	0.1288	1.1900e-003							0.0000	115.3579	115.3579	6.9000e-003	0.0000	115.5304

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0859	0.7021	0.5432	1.1800e-003							0.0000	99.7428	99.7428	0.0228	0.0000	100.3132
Total	0.0859	0.7021	0.5432	1.1800e-003							0.0000	99.7428	99.7428	0.0228	0.0000	100.3132

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3.6 Trenching - Tunnel Pipe Install - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0117	0.3356	0.0895	1.0700e-003							0.0000	104.3784	104.3784	6.6200e-003	0.0000	104.5439
Worker	5.2000e-003	3.7500e-003	0.0392	1.2000e-004							0.0000	10.9795	10.9795	2.8000e-004	0.0000	10.9866
Total	0.0169	0.3393	0.1288	1.1900e-003							0.0000	115.3579	115.3579	6.9000e-003	0.0000	115.5304

3.7 Trenching - Downstream Facility Excavation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0103	0.0966	0.0770	2.0000e-004							0.0000	17.5238	17.5238	5.5400e-003	0.0000	17.6623
Total	0.0103	0.0966	0.0770	2.0000e-004							0.0000	17.5238	17.5238	5.5400e-003	0.0000	17.6623

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3.7 Trenching - Downstream Facility Excavation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.4000e-004	4.0500e-003	1.0800e-003	1.0000e-005							0.0000	1.2597	1.2597	8.0000e-005	0.0000	1.2617
Worker	7.5000e-004	5.4000e-004	5.6800e-003	2.0000e-005							0.0000	1.5901	1.5901	4.0000e-005	0.0000	1.5912
Total	8.9000e-004	4.5900e-003	6.7600e-003	3.0000e-005							0.0000	2.8499	2.8499	1.2000e-004	0.0000	2.8529

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0103	0.0966	0.0770	2.0000e-004							0.0000	17.5238	17.5238	5.5400e-003	0.0000	17.6623
Total	0.0103	0.0966	0.0770	2.0000e-004							0.0000	17.5238	17.5238	5.5400e-003	0.0000	17.6623

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3.7 Trenching - Downstream Facility Excavation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.4000e-004	4.0500e-003	1.0800e-003	1.0000e-005							0.0000	1.2597	1.2597	8.0000e-005	0.0000	1.2617
Worker	7.5000e-004	5.4000e-004	5.6800e-003	2.0000e-005							0.0000	1.5901	1.5901	4.0000e-005	0.0000	1.5912
Total	8.9000e-004	4.5900e-003	6.7600e-003	3.0000e-005							0.0000	2.8499	2.8499	1.2000e-004	0.0000	2.8529

3.8 Building Construction - Inclined Intake Facility Components - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1462	1.3879	1.0303	2.6500e-003							0.0000	231.5267	231.5267	0.0646	0.0000	233.1405
Total	0.1462	1.3879	1.0303	2.6500e-003							0.0000	231.5267	231.5267	0.0646	0.0000	233.1405

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3.8 Building Construction - Inclined Intake Facility Components - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.1200e-003	0.2037	0.0543	6.5000e-004							0.0000	63.3469	63.3469	4.0200e-003	0.0000	63.4473
Worker	6.3100e-003	4.5500e-003	0.0476	1.5000e-004							0.0000	13.3269	13.3269	3.4000e-004	0.0000	13.3354
Total	0.0134	0.2082	0.1019	8.0000e-004							0.0000	76.6737	76.6737	4.3600e-003	0.0000	76.7827

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1462	1.3879	1.0303	2.6500e-003							0.0000	231.5264	231.5264	0.0646	0.0000	233.1402
Total	0.1462	1.3879	1.0303	2.6500e-003							0.0000	231.5264	231.5264	0.0646	0.0000	233.1402

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3.8 Building Construction - Inclined Intake Facility Components - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.1200e-003	0.2037	0.0543	6.5000e-004							0.0000	63.3469	63.3469	4.0200e-003	0.0000	63.4473
Worker	6.3100e-003	4.5500e-003	0.0476	1.5000e-004							0.0000	13.3269	13.3269	3.4000e-004	0.0000	13.3354
Total	0.0134	0.2082	0.1019	8.0000e-004							0.0000	76.6737	76.6737	4.3600e-003	0.0000	76.7827

3.8 Building Construction - Inclined Intake Facility Components - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0971	0.8712	0.7260	1.9200e-003							0.0000	168.3758	168.3758	0.0468	0.0000	169.5446
Total	0.0971	0.8712	0.7260	1.9200e-003							0.0000	168.3758	168.3758	0.0468	0.0000	169.5446

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3.8 Building Construction - Inclined Intake Facility Components - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.1900e-003	0.1273	0.0354	4.7000e-004							0.0000	45.7699	45.7699	2.8300e-003	0.0000	45.8406
Worker	4.3100e-003	2.9900e-003	0.0320	1.0000e-004							0.0000	9.4011	9.4011	2.3000e-004	0.0000	9.4067
Total	8.5000e-003	0.1303	0.0674	5.7000e-004							0.0000	55.1709	55.1709	3.0600e-003	0.0000	55.2474

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0971	0.8712	0.7260	1.9200e-003							0.0000	168.3756	168.3756	0.0468	0.0000	169.5444
Total	0.0971	0.8712	0.7260	1.9200e-003							0.0000	168.3756	168.3756	0.0468	0.0000	169.5444

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3.8 Building Construction - Inclined Intake Facility Components - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.1900e-003	0.1273	0.0354	4.7000e-004							0.0000	45.7699	45.7699	2.8300e-003	0.0000	45.8406
Worker	4.3100e-003	2.9900e-003	0.0320	1.0000e-004							0.0000	9.4011	9.4011	2.3000e-004	0.0000	9.4067
Total	8.5000e-003	0.1303	0.0674	5.7000e-004							0.0000	55.1709	55.1709	3.0600e-003	0.0000	55.2474

3.9 Building Construction - Downstream Facility Components - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1636	1.5308	1.2223	2.7700e-003							0.0000	241.2200	241.2200	0.0670	0.0000	242.8940
Total	0.1636	1.5308	1.2223	2.7700e-003							0.0000	241.2200	241.2200	0.0670	0.0000	242.8940

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3.9 Building Construction - Downstream Facility Components - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.3400e-003	0.1528	0.0408	4.9000e-004							0.0000	47.5102	47.5102	3.0100e-003	0.0000	47.5855
Worker	6.3100e-003	4.5500e-003	0.0476	1.5000e-004							0.0000	13.3269	13.3269	3.4000e-004	0.0000	13.3354
Total	0.0117	0.1573	0.0884	6.4000e-004							0.0000	60.8370	60.8370	3.3500e-003	0.0000	60.9209

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1636	1.5308	1.2223	2.7700e-003							0.0000	241.2197	241.2197	0.0670	0.0000	242.8937
Total	0.1636	1.5308	1.2223	2.7700e-003							0.0000	241.2197	241.2197	0.0670	0.0000	242.8937

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3.9 Building Construction - Downstream Facility Components - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.3400e-003	0.1528	0.0408	4.9000e-004							0.0000	47.5102	47.5102	3.0100e-003	0.0000	47.5855
Worker	6.3100e-003	4.5500e-003	0.0476	1.5000e-004							0.0000	13.3269	13.3269	3.4000e-004	0.0000	13.3354
Total	0.0117	0.1573	0.0884	6.4000e-004							0.0000	60.8370	60.8370	3.3500e-003	0.0000	60.9209

3.9 Building Construction - Downstream Facility Components - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1459	1.3121	1.1659	2.7000e-003							0.0000	235.7250	235.7250	0.0651	0.0000	237.3527
Total	0.1459	1.3121	1.1659	2.7000e-003							0.0000	235.7250	235.7250	0.0651	0.0000	237.3527

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3.9 Building Construction - Downstream Facility Components - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.2200e-003	0.1283	0.0357	4.7000e-004							0.0000	46.1274	46.1274	2.8500e-003	0.0000	46.1988
Worker	5.8000e-003	4.0100e-003	0.0430	1.4000e-004							0.0000	12.6327	12.6327	3.1000e-004	0.0000	12.6403
Total	0.0100	0.1323	0.0787	6.1000e-004							0.0000	58.7601	58.7601	3.1600e-003	0.0000	58.8391

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1459	1.3121	1.1659	2.7000e-003							0.0000	235.7248	235.7248	0.0651	0.0000	237.3524
Total	0.1459	1.3121	1.1659	2.7000e-003							0.0000	235.7248	235.7248	0.0651	0.0000	237.3524

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3.9 Building Construction - Downstream Facility Components - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.2200e-003	0.1283	0.0357	4.7000e-004							0.0000	46.1274	46.1274	2.8500e-003	0.0000	46.1988
Worker	5.8000e-003	4.0100e-003	0.0430	1.4000e-004							0.0000	12.6327	12.6327	3.1000e-004	0.0000	12.6403
Total	0.0100	0.1323	0.0787	6.1000e-004							0.0000	58.7601	58.7601	3.1600e-003	0.0000	58.8391

3.10 Demolition - Remove Intake Facility Cofferdam - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.8200e-003	0.0278	0.0376	6.0000e-005							0.0000	5.2176	5.2176	1.6900e-003	0.0000	5.2597
Total	2.8200e-003	0.0278	0.0376	6.0000e-005							0.0000	5.2176	5.2176	1.6900e-003	0.0000	5.2597

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3.10 Demolition - Remove Intake Facility Cofferdam - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.9000e-004	0.0111	2.9600e-003	4.0000e-005							0.0000	3.4493	3.4493	2.2000e-004	0.0000	3.4548
Worker	5.5000e-004	4.0000e-004	4.1500e-003	1.0000e-005							0.0000	1.1611	1.1611	3.0000e-005	0.0000	1.1618
Total	9.4000e-004	0.0115	7.1100e-003	5.0000e-005							0.0000	4.6103	4.6103	2.5000e-004	0.0000	4.6166

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.8200e-003	0.0278	0.0376	6.0000e-005							0.0000	5.2175	5.2175	1.6900e-003	0.0000	5.2597
Total	2.8200e-003	0.0278	0.0376	6.0000e-005							0.0000	5.2175	5.2175	1.6900e-003	0.0000	5.2597

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3.10 Demolition - Remove Intake Facility Cofferdam - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.9000e-004	0.0111	2.9600e-003	4.0000e-005							0.0000	3.4493	3.4493	2.2000e-004	0.0000	3.4548
Worker	5.5000e-004	4.0000e-004	4.1500e-003	1.0000e-005							0.0000	1.1611	1.1611	3.0000e-005	0.0000	1.1618
Total	9.4000e-004	0.0115	7.1100e-003	5.0000e-005							0.0000	4.6103	4.6103	2.5000e-004	0.0000	4.6166

3.11 Demolition - Abandon Existing Outlet Works - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0382	0.3337	0.2477	7.9000e-004							0.0000	69.3998	69.3998	0.0222	0.0000	69.9545
Total	0.0382	0.3337	0.2477	7.9000e-004							0.0000	69.3998	69.3998	0.0222	0.0000	69.9545

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3.11 Demolition - Abandon Existing Outlet Works - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0713	0.0198	2.6000e-004							0.0000	25.6264	25.6264	1.5900e-003	0.0000	25.6660
Worker	2.4100e-003	1.6700e-003	0.0179	6.0000e-005							0.0000	5.2636	5.2636	1.3000e-004	0.0000	5.2668
Total	4.7600e-003	0.0730	0.0377	3.2000e-004							0.0000	30.8900	30.8900	1.7200e-003	0.0000	30.9328

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0382	0.3337	0.2477	7.9000e-004							0.0000	69.3997	69.3997	0.0222	0.0000	69.9544
Total	0.0382	0.3337	0.2477	7.9000e-004							0.0000	69.3997	69.3997	0.0222	0.0000	69.9544

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3.11 Demolition - Abandon Existing Outlet Works - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0713	0.0198	2.6000e-004							0.0000	25.6264	25.6264	1.5900e-003	0.0000	25.6660
Worker	2.4100e-003	1.6700e-003	0.0179	6.0000e-005							0.0000	5.2636	5.2636	1.3000e-004	0.0000	5.2668
Total	4.7600e-003	0.0730	0.0377	3.2000e-004							0.0000	30.8900	30.8900	1.7200e-003	0.0000	30.9328

3.12 Site Preparation - Demobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0235	0.2152	0.1955	4.7000e-004							0.0000	41.1957	41.1957	0.0132	0.0000	41.5255
Total	0.0235	0.2152	0.1955	4.7000e-004							0.0000	41.1957	41.1957	0.0132	0.0000	41.5255

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3.12 Site Preparation - Demobilization - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.8000e-004	0.0237	6.5900e-003	9.0000e-005							0.0000	8.5223	8.5223	5.3000e-004	0.0000	8.5354
Worker	1.4800e-003	1.0300e-003	0.0110	4.0000e-005							0.0000	3.2316	3.2316	8.0000e-005	0.0000	3.2336
Total	2.2600e-003	0.0247	0.0176	1.3000e-004							0.0000	11.7539	11.7539	6.1000e-004	0.0000	11.7690

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0235	0.2152	0.1955	4.7000e-004							0.0000	41.1957	41.1957	0.0132	0.0000	41.5255
Total	0.0235	0.2152	0.1955	4.7000e-004							0.0000	41.1957	41.1957	0.0132	0.0000	41.5255

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3.12 Site Preparation - Demobilization - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.8000e-004	0.0237	6.5900e-003	9.0000e-005							0.0000	8.5223	8.5223	5.3000e-004	0.0000	8.5354
Worker	1.4800e-003	1.0300e-003	0.0110	4.0000e-005							0.0000	3.2316	3.2316	8.0000e-005	0.0000	3.2336
Total	2.2600e-003	0.0247	0.0176	1.3000e-004							0.0000	11.7539	11.7539	6.1000e-004	0.0000	11.7690

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0583	0.2682	0.8527	3.0500e-003							0.0000	279.7181	279.7181	0.0111	0.0000	279.9958
Unmitigated	0.0583	0.2682	0.8527	3.0500e-003							0.0000	279.7181	279.7181	0.0111	0.0000	279.9958

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
General Light Industry	255.03	48.30	24.88	744,182	744,182
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	255.03	48.30	24.88	744,182	744,182

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

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Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Other Asphalt Surfaces	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Other Non-Asphalt Surfaces	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated											0.0000	100.4961	100.4961	4.1500e-003	8.6000e-004	100.8557
Electricity Unmitigated											0.0000	100.4961	100.4961	4.1500e-003	8.6000e-004	100.8557
NaturalGas Mitigated	4.1400e-003	0.0376	0.0316	2.3000e-004							0.0000	40.9461	40.9461	7.8000e-004	7.5000e-004	41.1894
NaturalGas Unmitigated	4.1400e-003	0.0376	0.0316	2.3000e-004							0.0000	40.9461	40.9461	7.8000e-004	7.5000e-004	41.1894

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5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	767301	4.1400e-003	0.0376	0.0316	2.3000e-004							0.0000	40.9461	40.9461	7.8000e-004	7.5000e-004	41.1894
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		4.1400e-003	0.0376	0.0316	2.3000e-004							0.0000	40.9461	40.9461	7.8000e-004	7.5000e-004	41.1894

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	767301	4.1400e-003	0.0376	0.0316	2.3000e-004							0.0000	40.9461	40.9461	7.8000e-004	7.5000e-004	41.1894
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		4.1400e-003	0.0376	0.0316	2.3000e-004							0.0000	40.9461	40.9461	7.8000e-004	7.5000e-004	41.1894

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5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	315409	100.4961	4.1500e-003	8.6000e-004	100.8557
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		100.4961	4.1500e-003	8.6000e-004	100.8557

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	315409	100.4961	4.1500e-003	8.6000e-004	100.8557
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		100.4961	4.1500e-003	8.6000e-004	100.8557

6.0 Area Detail

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6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3554	0.0000	3.7000e-004	0.0000							0.0000	7.2000e-004	7.2000e-004	0.0000	0.0000	7.6000e-004
Unmitigated	0.3554	0.0000	3.7000e-004	0.0000							0.0000	7.2000e-004	7.2000e-004	0.0000	0.0000	7.6000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2025										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1528										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.0000e-005	0.0000	3.7000e-004	0.0000							0.0000	7.2000e-004	7.2000e-004	0.0000	0.0000	7.6000e-004
Total	0.3554	0.0000	3.7000e-004	0.0000							0.0000	7.2000e-004	7.2000e-004	0.0000	0.0000	7.6000e-004

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6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2025										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1528										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.0000e-005	0.0000	3.7000e-004	0.0000							0.0000	7.2000e-004	7.2000e-004	0.0000	0.0000	7.6000e-004
Total	0.3554	0.0000	3.7000e-004	0.0000							0.0000	7.2000e-004	7.2000e-004	0.0000	0.0000	7.6000e-004

7.0 Water Detail

7.1 Mitigation Measures Water

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	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	37.7890	0.2772	6.8100e-003	46.7475
Unmitigated	37.7890	0.2772	6.8100e-003	46.7475

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	8.46144 / 0	37.7890	0.2772	6.8100e-003	46.7475
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		37.7890	0.2772	6.8100e-003	46.7475

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7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	8.46144 / 0	37.7890	0.2772	6.8100e-003	46.7475
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		37.7890	0.2772	6.8100e-003	46.7475

8.0 Waste Detail

8.1 Mitigation Measures Waste

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Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	9.2097	0.5443	0.0000	22.8166
Unmitigated	9.2097	0.5443	0.0000	22.8166

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	45.37	9.2097	0.5443	0.0000	22.8166
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		9.2097	0.5443	0.0000	22.8166

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8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	45.37	9.2097	0.5443	0.0000	22.8166
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		9.2097	0.5443	0.0000	22.8166

9.0 Operational Offroad

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

Fire Pumps and Emergency Generators

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

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

Equipment Type	Number
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11.0 Vegetation

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	36.59	1000sqft	0.84	36,590.40	0
Other Asphalt Surfaces	0.56	Acre	0.56	24,393.60	0
Other Non-Asphalt Surfaces	3.14	Acre	3.14	136,778.40	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

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Project Characteristics - Start of construction based on the schedule provided in the Constructability Analysis report.

Land Use - Acreage based on Constructability Analysis figures.

Construction Phase - Schedule based on Constructability Analysis, Table 3-1.

Off-road Equipment - Concrete Pump Truck, Water Truck, and Flatbed= Off-highway Truck.

Off-road Equipment - Construction equipment based on Constructability Analysis reports.

Off-road Equipment - Construction equipment based on Constructability Analysis reports.

Off-road Equipment - Construction equipment based on Constructability Analysis reports.

Off-road Equipment - Construction equipment based on Constructability Analysis reports.

Trips and VMT - Trip details based on Constructability Analysis report. Assumes worker and vendor trips are from the cities of Castaic and Santa Clarita, approximately 20 miles to the east.

Grading -

Area Coating -

Energy Use -

Construction Off-road Equipment Mitigation -

Off-road Equipment - 1

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	18295	90387
tblAreaCoating	Area_Nonresidential_Interior	54886	271161
tblAreaCoating	Area_Parking	9670	1045
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblLandUse	BuildingSpaceSquareFeet	36,590.00	36,590.40
tblLandUse	LandUseSquareFeet	36,590.00	36,590.40
tblOffRoadEquipment	HorsePower	124.00	46.00
tblOffRoadEquipment	LoadFactor	0.44	0.45
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Site Preparation - Mobilization
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Grading - Access Roads and Pad
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Grading - Access Roads and Pad
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Site Preparation - Mobilization
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Grading - Access Roads and Pad

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tblOffRoadEquipment	PhaseName		Site Preparation - Mobilization
tblOffRoadEquipment	PhaseName		Grading - Access Roads and Pad
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Site Preparation - Mobilization
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Grading - Access Roads and Pad
tblOffRoadEquipment	PhaseName		Site Preparation - Mobilization
tblOffRoadEquipment	PhaseName		Grading - Access Roads and Pad
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	PhaseName		Trenching - Intake Facility Excavation
tblOffRoadEquipment	PhaseName		Trenching - Tunnel Excavation
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblProjectCharacteristics	OperationalYear	2018	2021
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00

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tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripNumber	18.00	20.00
tblTripsAndVMT	WorkerTripNumber	13.00	20.00
tblTripsAndVMT	WorkerTripNumber	18.00	24.00
tblTripsAndVMT	WorkerTripNumber	25.00	24.00
tblTripsAndVMT	WorkerTripNumber	25.00	24.00
tblTripsAndVMT	WorkerTripNumber	23.00	24.00
tblTripsAndVMT	WorkerTripNumber	15.00	20.00
tblTripsAndVMT	WorkerTripNumber	83.00	24.00
tblTripsAndVMT	WorkerTripNumber	8.00	12.00
tblTripsAndVMT	WorkerTripNumber	83.00	24.00
tblTripsAndVMT	WorkerTripNumber	3.00	8.00

2.0 Emissions Summary

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2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2791	2.8366	2.0828	5.0200e-003							0.0000	451.4705	451.4705	0.0975	0.0000	453.9067
2020	0.6204	6.2346	4.7004	0.0131							0.0000	1,171.0989	1,171.0989	0.2301	0.0000	1,176.8506
2021	0.6096	5.8788	4.7481	0.0145							0.0000	1,297.7968	1,297.7968	0.2803	0.0000	1,304.8034
2022	0.0604	0.5202	0.4713	1.6900e-003							0.0000	151.2669	151.2669	0.0375	0.0000	152.2043
Maximum	0.6204	6.2346	4.7481	0.0145							0.0000	1,297.7968	1,297.7968	0.2803	0.0000	1,304.8034

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2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.2791	2.8366	2.0828	5.0200e-003							0.0000	451.4701	451.4701	0.0975	0.0000	453.9063
2020	0.6204	6.2346	4.7004	0.0131							0.0000	1,171.0980	1,171.0980	0.2301	0.0000	1,176.8496
2021	0.6096	5.8787	4.7481	0.0145							0.0000	1,297.7957	1,297.7957	0.2803	0.0000	1,304.8023
2022	0.0604	0.5202	0.4713	1.6900e-003							0.0000	151.2667	151.2667	0.0375	0.0000	152.2041
Maximum	0.6204	6.2346	4.7481	0.0145							0.0000	1,297.7957	1,297.7957	0.2803	0.0000	1,304.8023

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	8-1-2019	10-31-2019	1.0112	1.0112
2	11-1-2019	1-31-2020	3.1110	3.1110
3	2-1-2020	4-30-2020	2.2273	2.2273
4	5-1-2020	7-31-2020	0.8570	0.8570
5	8-1-2020	10-31-2020	1.2162	1.2162
6	11-1-2020	1-31-2021	2.3341	2.3341
7	2-1-2021	4-30-2021	2.3553	2.3553
8	5-1-2021	7-31-2021	2.4298	2.4298

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9	8-1-2021	10-31-2021	0.8389	0.8389
10	11-1-2021	1-31-2022	0.0355	0.0355
12	5-1-2022	7-31-2022	0.5859	0.5859
		Highest	3.1110	3.1110

2.2 Overall Operational
Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3634	0.0000	3.7000e-004	0.0000							0.0000	7.2000e-004	7.2000e-004	0.0000	0.0000	7.7000e-004
Energy	4.1400e-003	0.0376	0.0316	2.3000e-004							0.0000	141.4422	141.4422	4.9300e-003	1.6100e-003	142.0451
Mobile	0.0583	0.2682	0.8527	3.0500e-003							0.0000	279.7181	279.7181	0.0111	0.0000	279.9958
Waste											9.2097	0.0000	9.2097	0.5443	0.0000	22.8166
Water											2.6844	35.1046	37.7890	0.2772	6.8100e-003	46.7475
Total	0.4259	0.3058	0.8847	3.2800e-003							11.8941	456.2656	468.1597	0.8375	8.4200e-003	491.6058

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2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3634	0.0000	3.7000e-004	0.0000							0.0000	7.2000e-004	7.2000e-004	0.0000	0.0000	7.7000e-004
Energy	4.1400e-003	0.0376	0.0316	2.3000e-004							0.0000	141.4422	141.4422	4.9300e-003	1.6100e-003	142.0451
Mobile	0.0583	0.2682	0.8527	3.0500e-003							0.0000	279.7181	279.7181	0.0111	0.0000	279.9958
Waste											9.2097	0.0000	9.2097	0.5443	0.0000	22.8166
Water											2.6844	35.1046	37.7890	0.2772	6.8100e-003	46.7475
Total	0.4259	0.3058	0.8847	3.2800e-003							11.8941	456.2656	468.1597	0.8375	8.4200e-003	491.6058

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation - Mobilization	Site Preparation	8/1/2019	8/31/2019	5	22	
2	Grading - Access Roads and Pad	Grading	9/1/2019	2/29/2020	5	130	
3	Trenching - Intake Facility Excavation	Trenching	11/1/2019	4/30/2020	5	130	
4	Trenching - Tunnel Excavation	Trenching	11/1/2019	4/30/2020	5	130	
5	Trenching - Tunnel Pipe Install	Trenching	5/1/2020	8/31/2020	5	87	
6	Building Construction - Intake Tower and Ancillary Facilities	Building Construction	9/1/2020	9/30/2021	5	283	
7	Trenching - Downstream Facility Excavation	Trenching	11/1/2020	11/30/2020	5	21	
8	Building Construction - Downstream Facility Components	Building Construction	12/1/2020	7/31/2021	5	174	
9	Demolition - Remove Intake Facility Cofferdam	Demolition	10/1/2021	11/30/2021	5	43	
10	Demolition - Abandon Existing Outlet Works	Demolition	5/1/2022	6/30/2022	5	44	
11	Site Preparation - Demobilization	Site Preparation	7/1/2022	7/31/2022	5	21	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 3.7

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation - Mobilization	Air Compressors	0	6.00	78	0.48
Site Preparation - Mobilization	Excavators	1	4.00	158	0.38
Site Preparation - Mobilization	Generator Sets	1	4.00	84	0.74
Site Preparation - Mobilization	Graders	1	4.00	187	0.41

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Site Preparation - Mobilization	Off-Highway Trucks	2	8.00	402	0.38
Site Preparation - Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation - Mobilization	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Site Preparation - Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading - Access Roads and Pad	Cranes	0	7.00	231	0.29
Grading - Access Roads and Pad	Dumpers/Tenders	1	8.00	16	0.38
Grading - Access Roads and Pad	Excavators	1	4.00	158	0.38
Grading - Access Roads and Pad	Forklifts	0	8.00	89	0.20
Grading - Access Roads and Pad	Generator Sets	1	8.00	84	0.74
Grading - Access Roads and Pad	Graders	1	8.00	187	0.41
Grading - Access Roads and Pad	Off-Highway Tractors	2	4.00	46	0.45
Grading - Access Roads and Pad	Off-Highway Trucks	1	8.00	402	0.38
Grading - Access Roads and Pad	Rubber Tired Dozers	0	8.00	247	0.40
Grading - Access Roads and Pad	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Trenching - Intake Facility Excavation	Aerial Lifts	1	8.00	63	0.31
Trenching - Intake Facility Excavation	Concrete/Industrial Saws	0	8.00	81	0.73
Trenching - Intake Facility Excavation	Cranes	1	4.00	231	0.29
Trenching - Intake Facility Excavation	Dumpers/Tenders	2	8.00	16	0.38
Trenching - Intake Facility Excavation	Excavators	1	8.00	158	0.38
Trenching - Intake Facility Excavation	Generator Sets	2	8.00	84	0.74
Trenching - Intake Facility Excavation	Off-Highway Trucks	1	8.00	402	0.38
Trenching - Intake Facility Excavation	Rubber Tired Dozers	0	8.00	247	0.40
Trenching - Intake Facility Excavation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching - Tunnel Excavation	Aerial Lifts	1	4.00	63	0.31
Trenching - Tunnel Excavation	Bore/Drill Rigs	1	8.00	221	0.50
Trenching - Tunnel Excavation	Crawler Tractors	1	8.00	212	0.43
Trenching - Tunnel Excavation	Crushing/Proc. Equipment	1	8.00	85	0.78

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Trenching - Tunnel Excavation	Dumpers/Tenders	1	8.00	16	0.38
Trenching - Tunnel Excavation	Excavators	1	8.00	158	0.38
Trenching - Tunnel Excavation	Generator Sets	1	8.00	84	0.74
Trenching - Tunnel Excavation	Graders	0	8.00	187	0.41
Trenching - Tunnel Excavation	Rubber Tired Dozers	0	8.00	247	0.40
Trenching - Tunnel Excavation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching - Tunnel Pipe Install	Cement and Mortar Mixers	0	6.00	9	0.56
Trenching - Tunnel Pipe Install	Crawler Tractors	1	4.00	212	0.43
Trenching - Tunnel Pipe Install	Generator Sets	1	8.00	84	0.74
Trenching - Tunnel Pipe Install	Off-Highway Trucks	1	6.00	402	0.38
Trenching - Tunnel Pipe Install	Pavers	0	8.00	130	0.42
Trenching - Tunnel Pipe Install	Paving Equipment	0	6.00	132	0.36
Trenching - Tunnel Pipe Install	Rollers	0	6.00	80	0.38
Trenching - Tunnel Pipe Install	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Trenching - Tunnel Pipe Install	Welders	2	8.00	46	0.45
Building Construction - Intake Tower and Ancillary Facilities	Aerial Lifts	1	4.00	63	0.31
Building Construction - Intake Tower and Ancillary Facilities	Air Compressors	1	8.00	78	0.48
Building Construction - Intake Tower and Ancillary Facilities	Cranes	1	4.00	231	0.29
Building Construction - Intake Tower and Ancillary Facilities	Forklifts	0	8.00	89	0.20
Building Construction - Intake Tower and Ancillary Facilities	Generator Sets	1	8.00	84	0.74
Building Construction - Intake Tower and Ancillary Facilities	Off-Highway Tractors	1	8.00	124	0.44
Building Construction - Intake Tower and Ancillary Facilities	Off-Highway Trucks	3	8.00	402	0.38
Building Construction - Intake Tower and Ancillary Facilities	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Building Construction - Intake Tower and Ancillary Facilities	Welders	0	8.00	46	0.45
Trenching - Downstream Facility Excavation	Dumpers/Tenders	1	8.00	16	0.38

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Trenching - Downstream Facility Excavation	Excavators	1	8.00	158	0.38
Trenching - Downstream Facility Excavation	Off-Highway Trucks	1	8.00	402	0.38
Trenching - Downstream Facility Excavation	Rubber Tired Dozers	0	8.00	247	0.40
Trenching - Downstream Facility Excavation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction - Downstream Facility Components	Air Compressors	1	8.00	78	0.48
Building Construction - Downstream Facility Components	Cranes	0	7.00	231	0.29
Building Construction - Downstream Facility Components	Cranes	1	4.00	231	0.29
Building Construction - Downstream Facility Components	Forklifts	0	8.00	89	0.20
Building Construction - Downstream Facility Components	Generator Sets	1	8.00	84	0.74
Building Construction - Downstream Facility Components	Off-Highway Tractors	1	8.00	124	0.44
Building Construction - Downstream Facility Components	Off-Highway Trucks	1	4.00	402	0.38
Building Construction - Downstream Facility Components	Off-Highway Trucks	2	8.00	402	0.38
Building Construction - Downstream Facility Components	Pavers	1	8.00	130	0.42
Building Construction - Downstream Facility Components	Rollers	1	8.00	80	0.38
Building Construction - Downstream Facility Components	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction - Downstream Facility Components	Welders	1	4.00	46	0.45
Demolition - Remove Intake Facility Cofferdam	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition - Remove Intake Facility Cofferdam	Excavators	1	8.00	158	0.38
Demolition - Remove Intake Facility Cofferdam	Rubber Tired Dozers	0	8.00	247	0.40
Demolition - Abandon Existing Outlet Works	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition - Abandon Existing Outlet Works	Dumpers/Tenders	1	8.00	16	0.38
Demolition - Abandon Existing Outlet Works	Excavators	0	8.00	158	0.38

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Demolition - Abandon Existing Outlet Works	Off-Highway Trucks	1	4.00	402	0.38
Demolition - Abandon Existing Outlet Works	Off-Highway Trucks	2	8.00	402	0.38
Demolition - Abandon Existing Outlet Works	Rubber Tired Dozers	0	8.00	247	0.40
Demolition - Abandon Existing Outlet Works	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation - Demobilization	Dumpers/Tenders	1	8.00	16	0.38
Site Preparation - Demobilization	Excavators	1	8.00	158	0.38
Site Preparation - Demobilization	Off-Highway Trucks	2	8.00	402	0.38
Site Preparation - Demobilization	Pavers	1	8.00	130	0.42
Site Preparation - Demobilization	Rollers	1	8.00	80	0.38
Site Preparation - Demobilization	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation - Demobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation - Mobilization	7	20.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading - Access Roads and Pad	10	24.00	11.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Intake Facility Excavation	10	24.00	14.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Tunnel Excavation	9	24.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Tunnel Pipe Install	6	20.00	40.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction - Intake Tower and Ancill	9	24.00	38.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Trenching - Downstream Facility Ex	3	12.00	2.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction - Downstream Facility C	11	24.00	18.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demolition - Remove Intake Facility Cofferdam	1	8.00	5.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demolition - Abandon Existing Outlet Works	5	20.00	19.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation - Demobilization	7	24.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT

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3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - Mobilization - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0260	0.2685	0.1745	4.4000e-004							0.0000	39.6434	39.6434	0.0118	0.0000	39.9373
Total	0.0260	0.2685	0.1745	4.4000e-004							0.0000	39.6434	39.6434	0.0118	0.0000	39.9373

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3.2 Site Preparation - Mobilization - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.3000e-004	0.0220	5.7400e-003	6.0000e-005							0.0000	5.9805	5.9805	3.9000e-004	0.0000	5.9904
Worker	1.4100e-003	1.0600e-003	0.0109	3.0000e-005							0.0000	2.8671	2.8671	8.0000e-005	0.0000	2.8691
Total	2.2400e-003	0.0231	0.0166	9.0000e-005							0.0000	8.8477	8.8477	4.7000e-004	0.0000	8.8595

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0260	0.2685	0.1745	4.4000e-004							0.0000	39.6434	39.6434	0.0118	0.0000	39.9373
Total	0.0260	0.2685	0.1745	4.4000e-004							0.0000	39.6434	39.6434	0.0118	0.0000	39.9373

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3.2 Site Preparation - Mobilization - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.3000e-004	0.0220	5.7400e-003	6.0000e-005							0.0000	5.9805	5.9805	3.9000e-004	0.0000	5.9904
Worker	1.4100e-003	1.0600e-003	0.0109	3.0000e-005							0.0000	2.8671	2.8671	8.0000e-005	0.0000	2.8691
Total	2.2400e-003	0.0231	0.0166	9.0000e-005							0.0000	8.8477	8.8477	4.7000e-004	0.0000	8.8595

3.3 Grading - Access Roads and Pad - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1106	1.1469	0.7982	1.7000e-003							0.0000	151.0437	151.0437	0.0411	0.0000	152.0703
Total	0.1106	1.1469	0.7982	1.7000e-003							0.0000	151.0437	151.0437	0.0411	0.0000	152.0703

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3.3 Grading - Access Roads and Pad - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0100e-003	0.1065	0.0277	3.0000e-004							0.0000	28.9059	28.9059	1.9000e-003	0.0000	28.9534
Worker	6.7000e-003	5.0400e-003	0.0517	1.5000e-004							0.0000	13.6058	13.6058	3.8000e-004	0.0000	13.6153
Total	0.0107	0.1116	0.0794	4.5000e-004							0.0000	42.5117	42.5117	2.2800e-003	0.0000	42.5688

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1106	1.1469	0.7982	1.7000e-003							0.0000	151.0435	151.0435	0.0411	0.0000	152.0702
Total	0.1106	1.1469	0.7982	1.7000e-003							0.0000	151.0435	151.0435	0.0411	0.0000	152.0702

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3.3 Grading - Access Roads and Pad - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0100e-003	0.1065	0.0277	3.0000e-004							0.0000	28.9059	28.9059	1.9000e-003	0.0000	28.9534
Worker	6.7000e-003	5.0400e-003	0.0517	1.5000e-004							0.0000	13.6058	13.6058	3.8000e-004	0.0000	13.6153
Total	0.0107	0.1116	0.0794	4.5000e-004							0.0000	42.5117	42.5117	2.2800e-003	0.0000	42.5688

3.3 Grading - Access Roads and Pad - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0508	0.5184	0.3882	8.4000e-004							0.0000	73.2916	73.2916	0.0202	0.0000	73.7966
Total	0.0508	0.5184	0.3882	8.4000e-004							0.0000	73.2916	73.2916	0.0202	0.0000	73.7966

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3.3 Grading - Access Roads and Pad - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.5900e-003	0.0456	0.0122	1.5000e-004							0.0000	14.1871	14.1871	9.0000e-004	0.0000	14.2096
Worker	3.0800e-003	2.2300e-003	0.0233	7.0000e-005							0.0000	6.5120	6.5120	1.7000e-004	0.0000	6.5162
Total	4.6700e-003	0.0478	0.0354	2.2000e-004							0.0000	20.6991	20.6991	1.0700e-003	0.0000	20.7257

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0508	0.5184	0.3882	8.4000e-004							0.0000	73.2915	73.2915	0.0202	0.0000	73.7965
Total	0.0508	0.5184	0.3882	8.4000e-004							0.0000	73.2915	73.2915	0.0202	0.0000	73.7965

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3.3 Grading - Access Roads and Pad - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.5900e-003	0.0456	0.0122	1.5000e-004							0.0000	14.1871	14.1871	9.0000e-004	0.0000	14.2096
Worker	3.0800e-003	2.2300e-003	0.0233	7.0000e-005							0.0000	6.5120	6.5120	1.7000e-004	0.0000	6.5162
Total	4.6700e-003	0.0478	0.0354	2.2000e-004							0.0000	20.6991	20.6991	1.0700e-003	0.0000	20.7257

3.4 Trenching - Intake Facility Excavation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0594	0.5744	0.4741	9.4000e-004							0.0000	82.9668	82.9668	0.0196	0.0000	83.4568
Total	0.0594	0.5744	0.4741	9.4000e-004							0.0000	82.9668	82.9668	0.0196	0.0000	83.4568

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3.4 Trenching - Intake Facility Excavation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.5200e-003	0.0670	0.0175	1.9000e-004							0.0000	18.1832	18.1832	1.2000e-003	0.0000	18.2131
Worker	3.3100e-003	2.4900e-003	0.0255	7.0000e-005							0.0000	6.7247	6.7247	1.9000e-004	0.0000	6.7294
Total	5.8300e-003	0.0695	0.0430	2.6000e-004							0.0000	24.9080	24.9080	1.3900e-003	0.0000	24.9426

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0594	0.5744	0.4741	9.4000e-004							0.0000	82.9667	82.9667	0.0196	0.0000	83.4567
Total	0.0594	0.5744	0.4741	9.4000e-004							0.0000	82.9667	82.9667	0.0196	0.0000	83.4567

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3.4 Trenching - Intake Facility Excavation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.5200e-003	0.0670	0.0175	1.9000e-004							0.0000	18.1832	18.1832	1.2000e-003	0.0000	18.2131
Worker	3.3100e-003	2.4900e-003	0.0255	7.0000e-005							0.0000	6.7247	6.7247	1.9000e-004	0.0000	6.7294
Total	5.8300e-003	0.0695	0.0430	2.6000e-004							0.0000	24.9080	24.9080	1.3900e-003	0.0000	24.9426

3.4 Trenching - Intake Facility Excavation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1104	1.0515	0.9440	1.9100e-003							0.0000	165.3576	165.3576	0.0393	0.0000	166.3402
Total	0.1104	1.0515	0.9440	1.9100e-003							0.0000	165.3576	165.3576	0.0393	0.0000	166.3402

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3.4 Trenching - Intake Facility Excavation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.1100e-003	0.1175	0.0313	3.8000e-004							0.0000	36.5324	36.5324	2.3200e-003	0.0000	36.5904
Worker	6.2400e-003	4.5000e-003	0.0471	1.5000e-004							0.0000	13.1754	13.1754	3.4000e-004	0.0000	13.1839
Total	0.0104	0.1220	0.0784	5.3000e-004							0.0000	49.7079	49.7079	2.6600e-003	0.0000	49.7742

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1104	1.0515	0.9440	1.9100e-003							0.0000	165.3574	165.3574	0.0393	0.0000	166.3400
Total	0.1104	1.0515	0.9440	1.9100e-003							0.0000	165.3574	165.3574	0.0393	0.0000	166.3400

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3.4 Trenching - Intake Facility Excavation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.1100e-003	0.1175	0.0313	3.8000e-004							0.0000	36.5324	36.5324	2.3200e-003	0.0000	36.5904
Worker	6.2400e-003	4.5000e-003	0.0471	1.5000e-004							0.0000	13.1754	13.1754	3.4000e-004	0.0000	13.1839
Total	0.0104	0.1220	0.0784	5.3000e-004							0.0000	49.7079	49.7079	2.6600e-003	0.0000	49.7742

3.5 Trenching - Tunnel Excavation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0594	0.5971	0.4603	9.4000e-004							0.0000	83.1354	83.1354	0.0199	0.0000	83.6336
Total	0.0594	0.5971	0.4603	9.4000e-004							0.0000	83.1354	83.1354	0.0199	0.0000	83.6336

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3.5 Trenching - Tunnel Excavation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.6200e-003	0.0431	0.0112	1.2000e-004							0.0000	11.6892	11.6892	7.7000e-004	0.0000	11.7085
Worker	3.3100e-003	2.4900e-003	0.0255	7.0000e-005							0.0000	6.7247	6.7247	1.9000e-004	0.0000	6.7294
Total	4.9300e-003	0.0456	0.0368	1.9000e-004							0.0000	18.4139	18.4139	9.6000e-004	0.0000	18.4379

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0594	0.5971	0.4603	9.4000e-004							0.0000	83.1353	83.1353	0.0199	0.0000	83.6335
Total	0.0594	0.5971	0.4603	9.4000e-004							0.0000	83.1353	83.1353	0.0199	0.0000	83.6335

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3.5 Trenching - Tunnel Excavation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.6200e-003	0.0431	0.0112	1.2000e-004							0.0000	11.6892	11.6892	7.7000e-004	0.0000	11.7085
Worker	3.3100e-003	2.4900e-003	0.0255	7.0000e-005							0.0000	6.7247	6.7247	1.9000e-004	0.0000	6.7294
Total	4.9300e-003	0.0456	0.0368	1.9000e-004							0.0000	18.4139	18.4139	9.6000e-004	0.0000	18.4379

3.5 Trenching - Tunnel Excavation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1116	1.1161	0.9250	1.9100e-003							0.0000	165.8084	165.8084	0.0400	0.0000	166.8083
Total	0.1116	1.1161	0.9250	1.9100e-003							0.0000	165.8084	165.8084	0.0400	0.0000	166.8083

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3.5 Trenching - Tunnel Excavation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0755	0.0202	2.4000e-004							0.0000	23.4851	23.4851	1.4900e-003	0.0000	23.5224
Worker	6.2400e-003	4.5000e-003	0.0471	1.5000e-004							0.0000	13.1754	13.1754	3.4000e-004	0.0000	13.1839
Total	8.8800e-003	0.0800	0.0672	3.9000e-004							0.0000	36.6606	36.6606	1.8300e-003	0.0000	36.7063

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1116	1.1161	0.9250	1.9100e-003							0.0000	165.8082	165.8082	0.0400	0.0000	166.8081
Total	0.1116	1.1161	0.9250	1.9100e-003							0.0000	165.8082	165.8082	0.0400	0.0000	166.8081

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3.5 Trenching - Tunnel Excavation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0755	0.0202	2.4000e-004							0.0000	23.4851	23.4851	1.4900e-003	0.0000	23.5224
Worker	6.2400e-003	4.5000e-003	0.0471	1.5000e-004							0.0000	13.1754	13.1754	3.4000e-004	0.0000	13.1839
Total	8.8800e-003	0.0800	0.0672	3.9000e-004							0.0000	36.6606	36.6606	1.8300e-003	0.0000	36.7063

3.6 Trenching - Tunnel Pipe Install - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0859	0.7021	0.5432	1.1800e-003							0.0000	99.7429	99.7429	0.0228	0.0000	100.3133
Total	0.0859	0.7021	0.5432	1.1800e-003							0.0000	99.7429	99.7429	0.0228	0.0000	100.3133

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3.6 Trenching - Tunnel Pipe Install - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0117	0.3356	0.0895	1.0700e-003							0.0000	104.3784	104.3784	6.6200e-003	0.0000	104.5439
Worker	5.2000e-003	3.7500e-003	0.0392	1.2000e-004							0.0000	10.9795	10.9795	2.8000e-004	0.0000	10.9866
Total	0.0169	0.3393	0.1288	1.1900e-003							0.0000	115.3579	115.3579	6.9000e-003	0.0000	115.5304

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0859	0.7021	0.5432	1.1800e-003							0.0000	99.7428	99.7428	0.0228	0.0000	100.3132
Total	0.0859	0.7021	0.5432	1.1800e-003							0.0000	99.7428	99.7428	0.0228	0.0000	100.3132

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3.6 Trenching - Tunnel Pipe Install - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0117	0.3356	0.0895	1.0700e-003							0.0000	104.3784	104.3784	6.6200e-003	0.0000	104.5439
Worker	5.2000e-003	3.7500e-003	0.0392	1.2000e-004							0.0000	10.9795	10.9795	2.8000e-004	0.0000	10.9866
Total	0.0169	0.3393	0.1288	1.1900e-003							0.0000	115.3579	115.3579	6.9000e-003	0.0000	115.5304

3.7 Building Construction - Intake Tower and Ancillary Facilities - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1462	1.3879	1.0303	2.6500e-003							0.0000	231.5267	231.5267	0.0646	0.0000	233.1405
Total	0.1462	1.3879	1.0303	2.6500e-003							0.0000	231.5267	231.5267	0.0646	0.0000	233.1405

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3.7 Building Construction - Intake Tower and Ancillary Facilities - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0113	0.3225	0.0861	1.0300e-003							0.0000	100.2992	100.2992	6.3600e-003	0.0000	100.4582
Worker	6.3100e-003	4.5500e-003	0.0476	1.5000e-004							0.0000	13.3269	13.3269	3.4000e-004	0.0000	13.3354
Total	0.0176	0.3270	0.1337	1.1800e-003							0.0000	113.6261	113.6261	6.7000e-003	0.0000	113.7937

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1462	1.3879	1.0303	2.6500e-003							0.0000	231.5264	231.5264	0.0646	0.0000	233.1402
Total	0.1462	1.3879	1.0303	2.6500e-003							0.0000	231.5264	231.5264	0.0646	0.0000	233.1402

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3.7 Building Construction - Intake Tower and Ancillary Facilities - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0113	0.3225	0.0861	1.0300e-003							0.0000	100.2992	100.2992	6.3600e-003	0.0000	100.4582
Worker	6.3100e-003	4.5500e-003	0.0476	1.5000e-004							0.0000	13.3269	13.3269	3.4000e-004	0.0000	13.3354
Total	0.0176	0.3270	0.1337	1.1800e-003							0.0000	113.6261	113.6261	6.7000e-003	0.0000	113.7937

3.7 Building Construction - Intake Tower and Ancillary Facilities - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2959	2.6544	2.2121	5.8600e-003							0.0000	513.0200	513.0200	0.1425	0.0000	516.5813
Total	0.2959	2.6544	2.2121	5.8600e-003							0.0000	513.0200	513.0200	0.1425	0.0000	516.5813

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3.7 Building Construction - Intake Tower and Ancillary Facilities - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0202	0.6143	0.1708	2.2600e-003							0.0000	220.8038	220.8038	0.0137	0.0000	221.1453
Worker	0.0131	9.1000e-003	0.0975	3.2000e-004							0.0000	28.6439	28.6439	6.9000e-004	0.0000	28.6612
Total	0.0334	0.6234	0.2683	2.5800e-003							0.0000	249.4477	249.4477	0.0144	0.0000	249.8064

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2959	2.6544	2.2121	5.8600e-003							0.0000	513.0193	513.0193	0.1425	0.0000	516.5807
Total	0.2959	2.6544	2.2121	5.8600e-003							0.0000	513.0193	513.0193	0.1425	0.0000	516.5807

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3.7 Building Construction - Intake Tower and Ancillary Facilities - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0202	0.6143	0.1708	2.2600e-003							0.0000	220.8038	220.8038	0.0137	0.0000	221.1453
Worker	0.0131	9.1000e-003	0.0975	3.2000e-004							0.0000	28.6439	28.6439	6.9000e-004	0.0000	28.6612
Total	0.0334	0.6234	0.2683	2.5800e-003							0.0000	249.4477	249.4477	0.0144	0.0000	249.8064

3.8 Trenching - Downstream Facility Excavation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0103	0.0966	0.0770	2.0000e-004							0.0000	17.5238	17.5238	5.5400e-003	0.0000	17.6623
Total	0.0103	0.0966	0.0770	2.0000e-004							0.0000	17.5238	17.5238	5.5400e-003	0.0000	17.6623

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3.8 Trenching - Downstream Facility Excavation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.4000e-004	4.0500e-003	1.0800e-003	1.0000e-005							0.0000	1.2597	1.2597	8.0000e-005	0.0000	1.2617
Worker	7.5000e-004	5.4000e-004	5.6800e-003	2.0000e-005							0.0000	1.5901	1.5901	4.0000e-005	0.0000	1.5912
Total	8.9000e-004	4.5900e-003	6.7600e-003	3.0000e-005							0.0000	2.8499	2.8499	1.2000e-004	0.0000	2.8529

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0103	0.0966	0.0770	2.0000e-004							0.0000	17.5238	17.5238	5.5400e-003	0.0000	17.6623
Total	0.0103	0.0966	0.0770	2.0000e-004							0.0000	17.5238	17.5238	5.5400e-003	0.0000	17.6623

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3.8 Trenching - Downstream Facility Excavation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.4000e-004	4.0500e-003	1.0800e-003	1.0000e-005							0.0000	1.2597	1.2597	8.0000e-005	0.0000	1.2617
Worker	7.5000e-004	5.4000e-004	5.6800e-003	2.0000e-005							0.0000	1.5901	1.5901	4.0000e-005	0.0000	1.5912
Total	8.9000e-004	4.5900e-003	6.7600e-003	3.0000e-005							0.0000	2.8499	2.8499	1.2000e-004	0.0000	2.8529

3.9 Building Construction - Downstream Facility Components - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.4001	0.3195	7.2000e-004							0.0000	63.0461	63.0461	0.0175	0.0000	63.4837
Total	0.0428	0.4001	0.3195	7.2000e-004							0.0000	63.0461	63.0461	0.0175	0.0000	63.4837

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3.9 Building Construction - Downstream Facility Components - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.4000e-003	0.0399	0.0107	1.3000e-004							0.0000	12.4174	12.4174	7.9000e-004	0.0000	12.4371
Worker	1.6500e-003	1.1900e-003	0.0124	4.0000e-005							0.0000	3.4832	3.4832	9.0000e-005	0.0000	3.4854
Total	3.0500e-003	0.0411	0.0231	1.7000e-004							0.0000	15.9006	15.9006	8.8000e-004	0.0000	15.9225

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0428	0.4001	0.3195	7.2000e-004							0.0000	63.0461	63.0461	0.0175	0.0000	63.4836
Total	0.0428	0.4001	0.3195	7.2000e-004							0.0000	63.0461	63.0461	0.0175	0.0000	63.4836

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3.9 Building Construction - Downstream Facility Components - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.4000e-003	0.0399	0.0107	1.3000e-004							0.0000	12.4174	12.4174	7.9000e-004	0.0000	12.4371
Worker	1.6500e-003	1.1900e-003	0.0124	4.0000e-005							0.0000	3.4832	3.4832	9.0000e-005	0.0000	3.4854
Total	3.0500e-003	0.0411	0.0231	1.7000e-004							0.0000	15.9006	15.9006	8.8000e-004	0.0000	15.9225

3.9 Building Construction - Downstream Facility Components - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2562	2.3038	2.0471	4.7500e-003							0.0000	413.8893	413.8893	0.1143	0.0000	416.7472
Total	0.2562	2.3038	2.0471	4.7500e-003							0.0000	413.8893	413.8893	0.1143	0.0000	416.7472

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3.9 Building Construction - Downstream Facility Components - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.4100e-003	0.2253	0.0627	8.3000e-004							0.0000	80.9912	80.9912	5.0100e-003	0.0000	81.1165
Worker	0.0102	7.0500e-003	0.0755	2.5000e-004							0.0000	22.1806	22.1806	5.4000e-004	0.0000	22.1940
Total	0.0176	0.2324	0.1382	1.0800e-003							0.0000	103.1718	103.1718	5.5500e-003	0.0000	103.3105

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2562	2.3038	2.0471	4.7500e-003							0.0000	413.8888	413.8888	0.1143	0.0000	416.7467
Total	0.2562	2.3038	2.0471	4.7500e-003							0.0000	413.8888	413.8888	0.1143	0.0000	416.7467

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3.9 Building Construction - Downstream Facility Components - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.4100e-003	0.2253	0.0627	8.3000e-004							0.0000	80.9912	80.9912	5.0100e-003	0.0000	81.1165
Worker	0.0102	7.0500e-003	0.0755	2.5000e-004							0.0000	22.1806	22.1806	5.4000e-004	0.0000	22.1940
Total	0.0176	0.2324	0.1382	1.0800e-003							0.0000	103.1718	103.1718	5.5500e-003	0.0000	103.3105

3.10 Demolition - Remove Intake Facility Cofferdam - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.9300e-003	0.0463	0.0703	1.1000e-004							0.0000	9.7560	9.7560	3.1600e-003	0.0000	9.8349
Total	4.9300e-003	0.0463	0.0703	1.1000e-004							0.0000	9.7560	9.7560	3.1600e-003	0.0000	9.8349

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3.10 Demolition - Remove Intake Facility Cofferdam - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.9000e-004	0.0178	4.9600e-003	7.0000e-005							0.0000	6.4066	6.4066	4.0000e-004	0.0000	6.4165
Worker	9.7000e-004	6.7000e-004	7.1700e-003	2.0000e-005							0.0000	2.1055	2.1055	5.0000e-005	0.0000	2.1067
Total	1.5600e-003	0.0185	0.0121	9.0000e-005							0.0000	8.5120	8.5120	4.5000e-004	0.0000	8.5232

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.9300e-003	0.0463	0.0703	1.1000e-004							0.0000	9.7560	9.7560	3.1600e-003	0.0000	9.8349
Total	4.9300e-003	0.0463	0.0703	1.1000e-004							0.0000	9.7560	9.7560	3.1600e-003	0.0000	9.8349

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3.10 Demolition - Remove Intake Facility Cofferdam - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.9000e-004	0.0178	4.9600e-003	7.0000e-005							0.0000	6.4066	6.4066	4.0000e-004	0.0000	6.4165
Worker	9.7000e-004	6.7000e-004	7.1700e-003	2.0000e-005							0.0000	2.1055	2.1055	5.0000e-005	0.0000	2.1067
Total	1.5600e-003	0.0185	0.0121	9.0000e-005							0.0000	8.5120	8.5120	4.5000e-004	0.0000	8.5232

3.11 Demolition - Abandon Existing Outlet Works - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0343	0.2678	0.2395	8.1000e-004							0.0000	71.0436	71.0436	0.0227	0.0000	71.6114
Total	0.0343	0.2678	0.2395	8.1000e-004							0.0000	71.0436	71.0436	0.0227	0.0000	71.6114

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3.11 Demolition - Abandon Existing Outlet Works - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.1300e-003	0.0636	0.0185	2.5000e-004							0.0000	24.6719	24.6719	1.5100e-003	0.0000	24.7096
Worker	2.3300e-003	1.5500e-003	0.0170	6.0000e-005							0.0000	5.1879	5.1879	1.2000e-004	0.0000	5.1908
Total	4.4600e-003	0.0651	0.0354	3.1000e-004							0.0000	29.8598	29.8598	1.6300e-003	0.0000	29.9004

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0343	0.2678	0.2395	8.1000e-004							0.0000	71.0435	71.0435	0.0227	0.0000	71.6113
Total	0.0343	0.2678	0.2395	8.1000e-004							0.0000	71.0435	71.0435	0.0227	0.0000	71.6113

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3.11 Demolition - Abandon Existing Outlet Works - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.1300e-003	0.0636	0.0185	2.5000e-004							0.0000	24.6719	24.6719	1.5100e-003	0.0000	24.7096
Worker	2.3300e-003	1.5500e-003	0.0170	6.0000e-005							0.0000	5.1879	5.1879	1.2000e-004	0.0000	5.1908
Total	4.4600e-003	0.0651	0.0354	3.1000e-004							0.0000	29.8598	29.8598	1.6300e-003	0.0000	29.9004

3.12 Site Preparation - Demobilization - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0196	0.1656	0.1807	4.5000e-004							0.0000	39.3356	39.3356	0.0126	0.0000	39.6505
Total	0.0196	0.1656	0.1807	4.5000e-004							0.0000	39.3356	39.3356	0.0126	0.0000	39.6505

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3.12 Site Preparation - Demobilization - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.9000e-004	0.0208	6.0300e-003	8.0000e-005							0.0000	8.0567	8.0567	4.9000e-004	0.0000	8.0690
Worker	1.3300e-003	8.9000e-004	9.7200e-003	3.0000e-005							0.0000	2.9713	2.9713	7.0000e-005	0.0000	2.9729
Total	2.0200e-003	0.0216	0.0158	1.1000e-004							0.0000	11.0280	11.0280	5.6000e-004	0.0000	11.0420

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0196	0.1656	0.1807	4.5000e-004							0.0000	39.3355	39.3355	0.0126	0.0000	39.6504
Total	0.0196	0.1656	0.1807	4.5000e-004							0.0000	39.3355	39.3355	0.0126	0.0000	39.6504

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3.12 Site Preparation - Demobilization - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.9000e-004	0.0208	6.0300e-003	8.0000e-005							0.0000	8.0567	8.0567	4.9000e-004	0.0000	8.0690
Worker	1.3300e-003	8.9000e-004	9.7200e-003	3.0000e-005							0.0000	2.9713	2.9713	7.0000e-005	0.0000	2.9729
Total	2.0200e-003	0.0216	0.0158	1.1000e-004							0.0000	11.0280	11.0280	5.6000e-004	0.0000	11.0420

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0583	0.2682	0.8527	3.0500e-003							0.0000	279.7181	279.7181	0.0111	0.0000	279.9958
Unmitigated	0.0583	0.2682	0.8527	3.0500e-003							0.0000	279.7181	279.7181	0.0111	0.0000	279.9958

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
General Light Industry	255.03	48.30	24.88	744,182	744,182
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	255.03	48.30	24.88	744,182	744,182

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

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Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Other Asphalt Surfaces	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600
Other Non-Asphalt Surfaces	0.583307	0.042169	0.188993	0.113757	0.020157	0.006497	0.019402	0.017654	0.001149	0.000992	0.003948	0.000375	0.001600

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated											0.0000	100.4961	100.4961	4.1500e-003	8.6000e-004	100.8557
Electricity Unmitigated											0.0000	100.4961	100.4961	4.1500e-003	8.6000e-004	100.8557
NaturalGas Mitigated	4.1400e-003	0.0376	0.0316	2.3000e-004							0.0000	40.9461	40.9461	7.8000e-004	7.5000e-004	41.1894
NaturalGas Unmitigated	4.1400e-003	0.0376	0.0316	2.3000e-004							0.0000	40.9461	40.9461	7.8000e-004	7.5000e-004	41.1894

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5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	767301	4.1400e-003	0.0376	0.0316	2.3000e-004							0.0000	40.9461	40.9461	7.8000e-004	7.5000e-004	41.1894
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		4.1400e-003	0.0376	0.0316	2.3000e-004							0.0000	40.9461	40.9461	7.8000e-004	7.5000e-004	41.1894

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	767301	4.1400e-003	0.0376	0.0316	2.3000e-004							0.0000	40.9461	40.9461	7.8000e-004	7.5000e-004	41.1894
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		4.1400e-003	0.0376	0.0316	2.3000e-004							0.0000	40.9461	40.9461	7.8000e-004	7.5000e-004	41.1894

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5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	315409	100.4961	4.1500e-003	8.6000e-004	100.8557
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		100.4961	4.1500e-003	8.6000e-004	100.8557

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	315409	100.4961	4.1500e-003	8.6000e-004	100.8557
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		100.4961	4.1500e-003	8.6000e-004	100.8557

6.0 Area Detail

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Annual

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3634	0.0000	3.7000e-004	0.0000							0.0000	7.2000e-004	7.2000e-004	0.0000	0.0000	7.7000e-004
Unmitigated	0.3634	0.0000	3.7000e-004	0.0000							0.0000	7.2000e-004	7.2000e-004	0.0000	0.0000	7.7000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2101										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1533										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.0000e-005	0.0000	3.7000e-004	0.0000							0.0000	7.2000e-004	7.2000e-004	0.0000	0.0000	7.7000e-004
Total	0.3634	0.0000	3.7000e-004	0.0000							0.0000	7.2000e-004	7.2000e-004	0.0000	0.0000	7.7000e-004

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6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2101										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1533										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.0000e-005	0.0000	3.7000e-004	0.0000							0.0000	7.2000e-004	7.2000e-004	0.0000	0.0000	7.7000e-004
Total	0.3634	0.0000	3.7000e-004	0.0000							0.0000	7.2000e-004	7.2000e-004	0.0000	0.0000	7.7000e-004

7.0 Water Detail

7.1 Mitigation Measures Water

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	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	37.7890	0.2772	6.8100e-003	46.7475
Unmitigated	37.7890	0.2772	6.8100e-003	46.7475

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	8.46144 / 0	37.7890	0.2772	6.8100e-003	46.7475
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		37.7890	0.2772	6.8100e-003	46.7475

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7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	8.46144 / 0	37.7890	0.2772	6.8100e-003	46.7475
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		37.7890	0.2772	6.8100e-003	46.7475

8.0 Waste Detail

8.1 Mitigation Measures Waste

Santa Felicia Dam Outlet Works Alt 2 - Ventura County, Annual

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	9.2097	0.5443	0.0000	22.8166
Unmitigated	9.2097	0.5443	0.0000	22.8166

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	45.37	9.2097	0.5443	0.0000	22.8166
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		9.2097	0.5443	0.0000	22.8166

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8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	45.37	9.2097	0.5443	0.0000	22.8166
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		9.2097	0.5443	0.0000	22.8166

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Annual

Santa Felicia Dam Spillway Imp Alt 1A
Ventura County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	0.23	Acre	0.23	10,018.80	0
User Defined Recreational	3.31	User Defined Unit	3.31	144,183.60	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Santa Felicia Dam Spillway Imp Alt 1A - Ventura County, Annual

Project Characteristics - Start of construction based on the schedule provided in the Constructability Analysis report.

Land Use - Acreage based on Constructability Analysis figures.

Construction Phase - Schedule based on Constructability Analysis, Table 3-1.

Off-road Equipment - Concrete Pump Truck, Water Truck, and Flatbed= Off-highway Truck.

Off-road Equipment - Flatbed, concrete pump truck, and water truck = Off-highway truck

Off-road Equipment - Water Truck= Off-highway truck, Compactor - off-highway tractor.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Water truck= off-highway truck

Off-road Equipment - Equipment info based on Constructability Analysis, Table 2. Chipper = generator set. Water truck, flatbed truck = off-highway truck.

Off-road Equipment - Construction equipment info based on Constructability Analysis report. Sheepsfoot compactor = off-highway tractor. Plate compactor = Walking and Whacker Compactors.

Off-road Equipment - flatbed and water truck = off-highway truck.

Off-road Equipment - Water truck and concrete pump truck = off-highway truck

Trips and VMT - Trip and VMT details based on Constructability Analysis report.

Grading -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Area Coating -

Energy Use -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblGrading	AcresOfGrading	5.25	0.00
tblLandUse	BuildingSpaceSquareFeet	0.00	144,183.60
tblLandUse	LandUseSquareFeet	0.00	144,183.60

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tblLandUse	LotAcreage	0.00	3.31
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00

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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Excavation for Chute Widening
tblOffRoadEquipment	PhaseName		Mobilization
tblOffRoadEquipment	PhaseName		Access Road Realignment

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tblOffRoadEquipment	PhaseName	Selective Site Demolition
tblOffRoadEquipment	PhaseName	Excavation for Chute Widening
tblOffRoadEquipment	PhaseName	Mobilization
tblOffRoadEquipment	PhaseName	Access Road Realignment
tblOffRoadEquipment	PhaseName	Selective Site Demolition
tblOffRoadEquipment	PhaseName	Excavation for Chute Widening
tblOffRoadEquipment	PhaseName	Demobilization/Reclamation
tblOffRoadEquipment	PhaseName	Mobilization
tblOffRoadEquipment	PhaseName	Access Road Realignment
tblOffRoadEquipment	PhaseName	Excavation for Chute Widening
tblOffRoadEquipment	PhaseName	Excavation for Chute Widening
tblOffRoadEquipment	PhaseName	Access Bridge
tblOffRoadEquipment	PhaseName	Mobilization
tblOffRoadEquipment	PhaseName	Access Road Realignment
tblOffRoadEquipment	PhaseName	Mobilization
tblOffRoadEquipment	PhaseName	Access Road Realignment
tblOffRoadEquipment	PhaseName	Access Road Realignment
tblOffRoadEquipment	PhaseName	MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName	Mobilization
tblOffRoadEquipment	PhaseName	Access Road Realignment
tblOffRoadEquipment	PhaseName	Selective Site Demolition
tblOffRoadEquipment	PhaseName	Excavation for Chute Widening
tblOffRoadEquipment	PhaseName	Training Walls and Chute Lining
tblOffRoadEquipment	PhaseName	Training Walls and Chute Lining
tblOffRoadEquipment	PhaseName	MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName	Bridge Pier and Abutment
tblOffRoadEquipment	PhaseName	Bridge Pier and Abutment

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tblOffRoadEquipment	PhaseName		Access Bridge
tblOffRoadEquipment	PhaseName		Access Bridge
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		Bridge Pier and Abutment
tblOffRoadEquipment	PhaseName		Access Bridge
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		Bridge Pier and Abutment
tblOffRoadEquipment	PhaseName		Access Bridge
tblOffRoadEquipment	PhaseName		Selective Site Demolition
tblOffRoadEquipment	PhaseName		Excavation for Chute Widening
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
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tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblProjectCharacteristics	OperationalYear	2018	2023
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00

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tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	0.00	17.00
tblTripsAndVMT	VendorTripNumber	0.00	13.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	25.00	15.00
tblTripsAndVMT	VendorTripNumber	25.00	13.00
tblTripsAndVMT	VendorTripNumber	25.00	15.00
tblTripsAndVMT	VendorTripNumber	25.00	12.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
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tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripNumber	23.00	20.00
tblTripsAndVMT	WorkerTripNumber	25.00	24.00
tblTripsAndVMT	WorkerTripNumber	23.00	28.00

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tblTripsAndVMT	WorkerTripNumber	30.00	28.00
tblTripsAndVMT	WorkerTripNumber	65.00	24.00
tblTripsAndVMT	WorkerTripNumber	65.00	28.00
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tblTripsAndVMT	WorkerTripNumber	65.00	20.00
tblTripsAndVMT	WorkerTripNumber	10.00	20.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00

2.0 Emissions Summary

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2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0792	0.7929	0.6484	1.7500e-003							0.0000	156.4062	156.4062	0.0375	0.0000	157.3444
2022	0.4205	3.7378	3.7961	0.0102							0.0000	910.6348	910.6348	0.2290	0.0000	916.3595
2023	0.2882	2.4429	2.3866	7.7200e-003							0.0000	689.8824	689.8824	0.1804	0.0000	694.3929
Maximum	0.4205	3.7378	3.7961	0.0102							0.0000	910.6348	910.6348	0.2290	0.0000	916.3595

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0792	0.7929	0.6484	1.7500e-003							0.0000	156.4060	156.4060	0.0375	0.0000	157.3443
2022	0.4205	3.7378	3.7961	0.0102							0.0000	910.6340	910.6340	0.2290	0.0000	916.3587
2023	0.2882	2.4429	2.3866	7.7200e-003							0.0000	689.8817	689.8817	0.1804	0.0000	694.3923
Maximum	0.4205	3.7378	3.7961	0.0102							0.0000	910.6340	910.6340	0.2290	0.0000	916.3587

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
2	1-1-2022	3-31-2022	0.5195	0.5195
3	4-1-2022	6-30-2022	0.5356	0.5356
		Highest	0.5356	0.5356

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.7312	0.0000	3.0000e-005	0.0000							0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	7.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.7312	0.0000	3.0000e-005	0.0000							0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	7.0000e-005

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2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.7312	0.0000	3.0000e-005	0.0000							0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	7.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.7312	0.0000	3.0000e-005	0.0000							0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	7.0000e-005

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Site Preparation	10/1/2021	10/31/2021	5	21	
2	Access Road Realignment	Paving	11/1/2021	1/31/2022	5	66	
3	Selective Site Demolition	Demolition	2/1/2022	5/31/2022	5	86	
4	Excavation for Chute Widening	Trenching	3/1/2022	8/31/2022	5	132	
5	Training Walls and Chute Lining	Building Construction	9/1/2022	4/30/2023	5	172	
6	MSE Wall Dam Raise	Building Construction	9/1/2022	12/31/2022	5	87	
7	Bridge Pier and Abutment	Building Construction	1/2/2023	4/30/2023	5	85	
8	Access Bridge	Building Construction	5/1/2023	8/31/2023	5	89	
9	Demobilization/Reclamation	Site Preparation	9/1/2023	9/30/2023	5	21	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.23

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Concrete/Industrial Saws	0	8.00	81	0.73
Mobilization	Dumpers/Tenders	1	4.00	16	0.38
Mobilization	Excavators	1	4.00	158	0.38
Mobilization	Generator Sets	1	4.00	84	0.74
Mobilization	Graders	1	4.00	187	0.41
Mobilization	Off-Highway Trucks	2	8.00	402	0.38
Mobilization	Rubber Tired Dozers	0	8.00	247	0.40

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Mobilization	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Mobilization	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Access Road Realignment	Cement and Mortar Mixers	0	6.00	9	0.56
Access Road Realignment	Concrete/Industrial Saws	0		81	0.73
Access Road Realignment	Dumpers/Tenders	1	8.00	16	0.38
Access Road Realignment	Excavators	1	8.00	158	0.38
Access Road Realignment	Generator Sets	1	4.00	84	0.74
Access Road Realignment	Graders	1	8.00	187	0.41
Access Road Realignment	Off-Highway Tractors	2	4.00	124	0.44
Access Road Realignment	Off-Highway Trucks	1	8.00	402	0.38
Access Road Realignment	Pavers	0	8.00	130	0.42
Access Road Realignment	Paving Equipment	0	6.00	132	0.36
Access Road Realignment	Rollers	0	6.00	80	0.38
Access Road Realignment	Tractors/Loaders/Backhoes	2	4.00	97	0.37
Access Road Realignment	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Selective Site Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Selective Site Demolition	Cranes	1	8.00	231	0.29
Selective Site Demolition	Dumpers/Tenders	2	8.00	16	0.38
Selective Site Demolition	Excavators	2	8.00	158	0.38
Selective Site Demolition	Off-Highway Trucks	2	8.00	402	0.38
Selective Site Demolition	Rubber Tired Dozers	0	8.00	247	0.40
Selective Site Demolition	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Excavation for Chute Widening	Aerial Lifts	1	4.00	63	0.31
Excavation for Chute Widening	Cranes	1	4.00	231	0.29
Excavation for Chute Widening	Dumpers/Tenders	4	8.00	16	0.38
Excavation for Chute Widening	Excavators	1	4.00	158	0.38
Excavation for Chute Widening	Excavators	2	8.00	158	0.38

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Excavation for Chute Widening	Off-Highway Trucks	1	8.00	402	0.38
Excavation for Chute Widening	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Training Walls and Chute Lining	Cranes	1	8.00	231	0.29
Training Walls and Chute Lining	Forklifts	0	8.00	89	0.20
Training Walls and Chute Lining	Generator Sets	0	8.00	84	0.74
Training Walls and Chute Lining	Off-Highway Trucks	1	4.00	402	0.38
Training Walls and Chute Lining	Off-Highway Trucks	1	8.00	402	0.38
Training Walls and Chute Lining	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Training Walls and Chute Lining	Welders	0	8.00	46	0.45
MSE Wall Dam Raise	Cranes	0	7.00	231	0.29
MSE Wall Dam Raise	Forklifts	0	8.00	89	0.20
MSE Wall Dam Raise	Generator Sets	0	8.00	84	0.74
MSE Wall Dam Raise	Off-Highway Tractors	1	8.00	124	0.44
MSE Wall Dam Raise	Off-Highway Trucks	1	8.00	402	0.38
MSE Wall Dam Raise	Pavers	1	8.00	130	0.42
MSE Wall Dam Raise	Plate Compactors	4	8.00	8	0.43
MSE Wall Dam Raise	Rollers	2	8.00	80	0.38
MSE Wall Dam Raise	Tractors/Loaders/Backhoes	2	8.00	97	0.37
MSE Wall Dam Raise	Welders	0	8.00	46	0.45
Bridge Pier and Abutment	Cranes	1	8.00	231	0.29
Bridge Pier and Abutment	Forklifts	0	8.00	89	0.20
Bridge Pier and Abutment	Generator Sets	0	8.00	84	0.74
Bridge Pier and Abutment	Off-Highway Trucks	1	4.00	402	0.38
Bridge Pier and Abutment	Off-Highway Trucks	2	8.00	402	0.38
Bridge Pier and Abutment	Pavers	1	8.00	130	0.42
Bridge Pier and Abutment	Rollers	1	8.00	80	0.38
Bridge Pier and Abutment	Tractors/Loaders/Backhoes	1	8.00	97	0.37

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Bridge Pier and Abutment	Welders	0	8.00	46	0.45
Access Bridge	Cranes	1	8.00	231	0.29
Access Bridge	Excavators	1	8.00	158	0.38
Access Bridge	Forklifts	0	8.00	89	0.20
Access Bridge	Generator Sets	0	8.00	84	0.74
Access Bridge	Off-Highway Trucks	1	4.00	402	0.38
Access Bridge	Off-Highway Trucks	2	8.00	402	0.38
Access Bridge	Pavers	1	8.00	130	0.42
Access Bridge	Rollers	1	8.00	80	0.38
Access Bridge	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Access Bridge	Welders	0	8.00	46	0.45
Demobilization/Reclamation	Dumpers/Tenders	1	8.00	16	0.38
Demobilization/Reclamation	Off-Highway Trucks	2	8.00	402	0.38
Demobilization/Reclamation	Rubber Tired Dozers	0	8.00	247	0.40
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demobilization/Reclamation	Generator Sets	2	8.00	84	0.74

Trips and VMT

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Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	9	20.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Access Road Realignment	10	24.00	17.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Selective Site Demolition	9	28.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Excavation for Chute Widening	12	28.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Training Walls and Chute Lining	4	24.00	15.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
MSE Wall Dam Raise	11	28.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Bridge Pier and Abutment	7	20.00	15.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Access Bridge	8	20.00	12.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	20.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

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3.2 Mobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0235	0.2218	0.1821	4.6000e-004							0.0000	40.2185	40.2185	0.0121	0.0000	40.5219
Total	0.0235	0.2218	0.1821	4.6000e-004							0.0000	40.2185	40.2185	0.0121	0.0000	40.5219

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.2000e-004	0.0157	4.3600e-003	6.0000e-005							0.0000	5.6318	5.6318	3.5000e-004	0.0000	5.6406
Worker	1.1800e-003	8.2000e-004	8.7500e-003	3.0000e-005							0.0000	2.5706	2.5706	6.0000e-005	0.0000	2.5722
Total	1.7000e-003	0.0165	0.0131	9.0000e-005							0.0000	8.2024	8.2024	4.1000e-004	0.0000	8.2127

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3.2 Mobilization - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0235	0.2218	0.1821	4.6000e-004							0.0000	40.2185	40.2185	0.0121	0.0000	40.5219
Total	0.0235	0.2218	0.1821	4.6000e-004							0.0000	40.2185	40.2185	0.0121	0.0000	40.5219

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.2000e-004	0.0157	4.3600e-003	6.0000e-005							0.0000	5.6318	5.6318	3.5000e-004	0.0000	5.6406
Worker	1.1800e-003	8.2000e-004	8.7500e-003	3.0000e-005							0.0000	2.5706	2.5706	6.0000e-005	0.0000	2.5722
Total	1.7000e-003	0.0165	0.0131	9.0000e-005							0.0000	8.2024	8.2024	4.1000e-004	0.0000	8.2127

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3.3 Access Road Realignment - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0487	0.4892	0.4130	9.0000e-004							0.0000	78.5796	78.5796	0.0234	0.0000	79.1649
Paving	2.1000e-004										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0489	0.4892	0.4130	9.0000e-004							0.0000	78.5796	78.5796	0.0234	0.0000	79.1649

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0900e-003	0.0634	0.0176	2.3000e-004							0.0000	22.7955	22.7955	1.4100e-003	0.0000	22.8308
Worker	3.0300e-003	2.1000e-003	0.0225	7.0000e-005							0.0000	6.6101	6.6101	1.6000e-004	0.0000	6.6141
Total	5.1200e-003	0.0655	0.0401	3.0000e-004							0.0000	29.4057	29.4057	1.5700e-003	0.0000	29.4449

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3.3 Access Road Realignment - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0487	0.4892	0.4130	9.0000e-004							0.0000	78.5795	78.5795	0.0234	0.0000	79.1648
Paving	2.1000e-004										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0489	0.4892	0.4130	9.0000e-004							0.0000	78.5795	78.5795	0.0234	0.0000	79.1648

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0900e-003	0.0634	0.0176	2.3000e-004							0.0000	22.7955	22.7955	1.4100e-003	0.0000	22.8308
Worker	3.0300e-003	2.1000e-003	0.0225	7.0000e-005							0.0000	6.6101	6.6101	1.6000e-004	0.0000	6.6141
Total	5.1200e-003	0.0655	0.0401	3.0000e-004							0.0000	29.4057	29.4057	1.5700e-003	0.0000	29.4449

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3.3 Access Road Realignment - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0203	0.1941	0.1886	4.2000e-004							0.0000	36.6747	36.6747	0.0109	0.0000	36.9477
Paving	1.0000e-004										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0204	0.1941	0.1886	4.2000e-004							0.0000	36.6747	36.6747	0.0109	0.0000	36.9477

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.1000e-004	0.0271	7.8900e-003	1.1000e-004							0.0000	10.5357	10.5357	6.4000e-004	0.0000	10.5518
Worker	1.3300e-003	8.9000e-004	9.7200e-003	3.0000e-005							0.0000	2.9713	2.9713	7.0000e-005	0.0000	2.9729
Total	2.2400e-003	0.0280	0.0176	1.4000e-004							0.0000	13.5070	13.5070	7.1000e-004	0.0000	13.5247

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3.3 Access Road Realignment - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0203	0.1941	0.1886	4.2000e-004							0.0000	36.6747	36.6747	0.0109	0.0000	36.9476
Paving	1.0000e-004										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0204	0.1941	0.1886	4.2000e-004							0.0000	36.6747	36.6747	0.0109	0.0000	36.9476

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.1000e-004	0.0271	7.8900e-003	1.1000e-004							0.0000	10.5357	10.5357	6.4000e-004	0.0000	10.5518
Worker	1.3300e-003	8.9000e-004	9.7200e-003	3.0000e-005							0.0000	2.9713	2.9713	7.0000e-005	0.0000	2.9729
Total	2.2400e-003	0.0280	0.0176	1.4000e-004							0.0000	13.5070	13.5070	7.1000e-004	0.0000	13.5247

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3.4 Selective Site Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0994	0.8620	0.8642	2.1600e-003							0.0000	188.8497	188.8497	0.0601	0.0000	190.3510
Total	0.0994	0.8620	0.8642	2.1600e-003							0.0000	188.8497	188.8497	0.0601	0.0000	190.3510

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8400e-003	0.0850	0.0247	3.4000e-004							0.0000	32.9942	32.9942	2.0200e-003	0.0000	33.0446
Worker	6.3800e-003	4.2300e-003	0.0464	1.6000e-004							0.0000	14.1960	14.1960	3.2000e-004	0.0000	14.2040
Total	9.2200e-003	0.0892	0.0712	5.0000e-004							0.0000	47.1901	47.1901	2.3400e-003	0.0000	47.2486

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3.4 Selective Site Demolition - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0994	0.8620	0.8642	2.1600e-003							0.0000	188.8495	188.8495	0.0601	0.0000	190.3507
Total	0.0994	0.8620	0.8642	2.1600e-003							0.0000	188.8495	188.8495	0.0601	0.0000	190.3507

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8400e-003	0.0850	0.0247	3.4000e-004							0.0000	32.9942	32.9942	2.0200e-003	0.0000	33.0446
Worker	6.3800e-003	4.2300e-003	0.0464	1.6000e-004							0.0000	14.1960	14.1960	3.2000e-004	0.0000	14.2040
Total	9.2200e-003	0.0892	0.0712	5.0000e-004							0.0000	47.1901	47.1901	2.3400e-003	0.0000	47.2486

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3.5 Excavation for Chute Widening - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1229	1.0585	1.2190	2.5800e-003							0.0000	223.6893	223.6893	0.0692	0.0000	225.4191
Total	0.1229	1.0585	1.2190	2.5800e-003							0.0000	223.6893	223.6893	0.0692	0.0000	225.4191

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0200e-003	0.0903	0.0263	3.6000e-004							0.0000	35.0600	35.0600	2.1400e-003	0.0000	35.1136
Worker	9.7900e-003	6.5000e-003	0.0713	2.4000e-004							0.0000	21.7891	21.7891	4.9000e-004	0.0000	21.8015
Total	0.0128	0.0968	0.0975	6.0000e-004							0.0000	56.8492	56.8492	2.6300e-003	0.0000	56.9151

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3.5 Excavation for Chute Widening - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1229	1.0585	1.2190	2.5800e-003							0.0000	223.6890	223.6890	0.0692	0.0000	225.4188
Total	0.1229	1.0585	1.2190	2.5800e-003							0.0000	223.6890	223.6890	0.0692	0.0000	225.4188

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0200e-003	0.0903	0.0263	3.6000e-004							0.0000	35.0600	35.0600	2.1400e-003	0.0000	35.1136
Worker	9.7900e-003	6.5000e-003	0.0713	2.4000e-004							0.0000	21.7891	21.7891	4.9000e-004	0.0000	21.8015
Total	0.0128	0.0968	0.0975	6.0000e-004							0.0000	56.8492	56.8492	2.6300e-003	0.0000	56.9151

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3.6 Training Walls and Chute Lining - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0579	0.5168	0.3988	1.2500e-003							0.0000	109.6485	109.6485	0.0355	0.0000	110.5351
Total	0.0579	0.5168	0.3988	1.2500e-003							0.0000	109.6485	109.6485	0.0355	0.0000	110.5351

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.3200e-003	0.0992	0.0288	3.9000e-004							0.0000	38.5129	38.5129	2.3500e-003	0.0000	38.5718
Worker	5.5300e-003	3.6700e-003	0.0403	1.4000e-004							0.0000	12.3094	12.3094	2.8000e-004	0.0000	12.3164
Total	8.8500e-003	0.1029	0.0691	5.3000e-004							0.0000	50.8223	50.8223	2.6300e-003	0.0000	50.8882

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3.6 Training Walls and Chute Lining - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0579	0.5168	0.3988	1.2500e-003							0.0000	109.6484	109.6484	0.0355	0.0000	110.5350
Total	0.0579	0.5168	0.3988	1.2500e-003							0.0000	109.6484	109.6484	0.0355	0.0000	110.5350

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.3200e-003	0.0992	0.0288	3.9000e-004							0.0000	38.5129	38.5129	2.3500e-003	0.0000	38.5718
Worker	5.5300e-003	3.6700e-003	0.0403	1.4000e-004							0.0000	12.3094	12.3094	2.8000e-004	0.0000	12.3164
Total	8.8500e-003	0.1029	0.0691	5.3000e-004							0.0000	50.8223	50.8223	2.6300e-003	0.0000	50.8882

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3.6 Training Walls and Chute Lining - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0535	0.4549	0.3824	1.2200e-003							0.0000	107.1927	107.1927	0.0347	0.0000	108.0594
Total	0.0535	0.4549	0.3824	1.2200e-003							0.0000	107.1927	107.1927	0.0347	0.0000	108.0594

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3800e-003	0.0654	0.0257	3.8000e-004							0.0000	36.7791	36.7791	2.1600e-003	0.0000	36.8330
Worker	5.1000e-003	3.2400e-003	0.0364	1.3000e-004							0.0000	11.5654	11.5654	2.5000e-004	0.0000	11.5716
Total	7.4800e-003	0.0686	0.0621	5.1000e-004							0.0000	48.3445	48.3445	2.4100e-003	0.0000	48.4046

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3.6 Training Walls and Chute Lining - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0535	0.4549	0.3824	1.2200e-003							0.0000	107.1926	107.1926	0.0347	0.0000	108.0593
Total	0.0535	0.4549	0.3824	1.2200e-003							0.0000	107.1926	107.1926	0.0347	0.0000	108.0593

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3800e-003	0.0654	0.0257	3.8000e-004							0.0000	36.7791	36.7791	2.1600e-003	0.0000	36.8330
Worker	5.1000e-003	3.2400e-003	0.0364	1.3000e-004							0.0000	11.5654	11.5654	2.5000e-004	0.0000	11.5716
Total	7.4800e-003	0.0686	0.0621	5.1000e-004							0.0000	48.3445	48.3445	2.4100e-003	0.0000	48.4046

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3.7 MSE Wall Dam Raise - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0774	0.6993	0.7981	1.5700e-003							0.0000	135.6651	135.6651	0.0427	0.0000	136.7321
Total	0.0774	0.6993	0.7981	1.5700e-003							0.0000	135.6651	135.6651	0.0427	0.0000	136.7321

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8800e-003	0.0860	0.0250	3.4000e-004							0.0000	33.3779	33.3779	2.0400e-003	0.0000	33.4289
Worker	6.4500e-003	4.2800e-003	0.0470	1.6000e-004							0.0000	14.3610	14.3610	3.3000e-004	0.0000	14.3692
Total	9.3300e-003	0.0903	0.0720	5.0000e-004							0.0000	47.7389	47.7389	2.3700e-003	0.0000	47.7980

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3.7 MSE Wall Dam Raise - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0774	0.6993	0.7981	1.5700e-003							0.0000	135.6649	135.6649	0.0427	0.0000	136.7320
Total	0.0774	0.6993	0.7981	1.5700e-003							0.0000	135.6649	135.6649	0.0427	0.0000	136.7320

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8800e-003	0.0860	0.0250	3.4000e-004							0.0000	33.3779	33.3779	2.0400e-003	0.0000	33.4289
Worker	6.4500e-003	4.2800e-003	0.0470	1.6000e-004							0.0000	14.3610	14.3610	3.3000e-004	0.0000	14.3692
Total	9.3300e-003	0.0903	0.0720	5.0000e-004							0.0000	47.7389	47.7389	2.3700e-003	0.0000	47.7980

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3.8 Bridge Pier and Abutment - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0896	0.7550	0.7235	2.0900e-003							0.0000	183.8875	183.8875	0.0595	0.0000	185.3743
Total	0.0896	0.7550	0.7235	2.0900e-003							0.0000	183.8875	183.8875	0.0595	0.0000	185.3743

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3800e-003	0.0654	0.0257	3.8000e-004							0.0000	36.7791	36.7791	2.1600e-003	0.0000	36.8330
Worker	4.2500e-003	2.7000e-003	0.0303	1.1000e-004							0.0000	9.6379	9.6379	2.0000e-004	0.0000	9.6430
Total	6.6300e-003	0.0681	0.0560	4.9000e-004							0.0000	46.4170	46.4170	2.3600e-003	0.0000	46.4760

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3.8 Bridge Pier and Abutment - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0896	0.7550	0.7235	2.0900e-003							0.0000	183.8873	183.8873	0.0595	0.0000	185.3741
Total	0.0896	0.7550	0.7235	2.0900e-003							0.0000	183.8873	183.8873	0.0595	0.0000	185.3741

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3800e-003	0.0654	0.0257	3.8000e-004							0.0000	36.7791	36.7791	2.1600e-003	0.0000	36.8330
Worker	4.2500e-003	2.7000e-003	0.0303	1.1000e-004							0.0000	9.6379	9.6379	2.0000e-004	0.0000	9.6430
Total	6.6300e-003	0.0681	0.0560	4.9000e-004							0.0000	46.4170	46.4170	2.3600e-003	0.0000	46.4760

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3.9 Access Bridge - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1022	0.8594	0.9025	2.4200e-003							0.0000	212.7302	212.7302	0.0688	0.0000	214.4502
Total	0.1022	0.8594	0.9025	2.4200e-003							0.0000	212.7302	212.7302	0.0688	0.0000	214.4502

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.9900e-003	0.0547	0.0215	3.1000e-004							0.0000	30.8079	30.8079	1.8100e-003	0.0000	30.8530
Worker	4.4500e-003	2.8300e-003	0.0317	1.1000e-004							0.0000	10.0914	10.0914	2.1000e-004	0.0000	10.0968
Total	6.4400e-003	0.0576	0.0533	4.2000e-004							0.0000	40.8993	40.8993	2.0200e-003	0.0000	40.9498

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3.9 Access Bridge - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1022	0.8594	0.9025	2.4200e-003							0.0000	212.7299	212.7299	0.0688	0.0000	214.4499
Total	0.1022	0.8594	0.9025	2.4200e-003							0.0000	212.7299	212.7299	0.0688	0.0000	214.4499

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.9900e-003	0.0547	0.0215	3.1000e-004							0.0000	30.8079	30.8079	1.8100e-003	0.0000	30.8530
Worker	4.4500e-003	2.8300e-003	0.0317	1.1000e-004							0.0000	10.0914	10.0914	2.1000e-004	0.0000	10.0968
Total	6.4400e-003	0.0576	0.0533	4.2000e-004							0.0000	40.8993	40.8993	2.0200e-003	0.0000	40.9498

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3.10 Demobilization/Reclamation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0210	0.1691	0.1956	4.9000e-004							0.0000	42.5781	42.5781	0.0103	0.0000	42.8364
Total	0.0210	0.1691	0.1956	4.9000e-004							0.0000	42.5781	42.5781	0.0103	0.0000	42.8364

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.5000e-004	9.6900e-003	3.8100e-003	6.0000e-005							0.0000	5.4520	5.4520	3.2000e-004	0.0000	5.4600
Worker	1.0500e-003	6.7000e-004	7.4800e-003	3.0000e-005							0.0000	2.3811	2.3811	5.0000e-005	0.0000	2.3824
Total	1.4000e-003	0.0104	0.0113	9.0000e-005							0.0000	7.8331	7.8331	3.7000e-004	0.0000	7.8423

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3.10 Demobilization/Reclamation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0210	0.1691	0.1956	4.9000e-004							0.0000	42.5781	42.5781	0.0103	0.0000	42.8363
Total	0.0210	0.1691	0.1956	4.9000e-004							0.0000	42.5781	42.5781	0.0103	0.0000	42.8363

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.5000e-004	9.6900e-003	3.8100e-003	6.0000e-005							0.0000	5.4520	5.4520	3.2000e-004	0.0000	5.4600
Worker	1.0500e-003	6.7000e-004	7.4800e-003	3.0000e-005							0.0000	2.3811	2.3811	5.0000e-005	0.0000	2.3824
Total	1.4000e-003	0.0104	0.0113	9.0000e-005							0.0000	7.8331	7.8331	3.7000e-004	0.0000	7.8423

4.0 Operational Detail - Mobile

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4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
User Defined Recreational	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0
User Defined Recreational	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

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Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.593330	0.040945	0.188012	0.107577	0.017981	0.006204	0.019981	0.018142	0.001176	0.001026	0.003857	0.000384	0.001386
User Defined Recreational	0.593330	0.040945	0.188012	0.107577	0.017981	0.006204	0.019981	0.018142	0.001176	0.001026	0.003857	0.000384	0.001386

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.7312	0.0000	3.0000e-005	0.0000							0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	7.0000e-005
Unmitigated	0.7312	0.0000	3.0000e-005	0.0000							0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	7.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1674										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.5638										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	3.0000e-005	0.0000							0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	7.0000e-005
Total	0.7312	0.0000	3.0000e-005	0.0000							0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	7.0000e-005

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6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1674										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.5638										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	3.0000e-005	0.0000							0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	7.0000e-005
Total	0.7312	0.0000	3.0000e-005	0.0000							0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	7.0000e-005

7.0 Water Detail

7.1 Mitigation Measures Water

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	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

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7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

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8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

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

Fire Pumps and Emergency Generators

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

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

Equipment Type	Number
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11.0 Vegetation

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**Santa Felicia Dam Spillway Imp Alt 1B
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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	2.30	Acre	2.30	100,188.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

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Project Characteristics - Start of construction based on the schedule provided in the Constructability Analysis report.

Land Use - Acreage based on Constructability Analysis figures.

Construction Phase - Schedule based on Constructability Analysis, Table 3-1.

Off-road Equipment - Concrete Pump Truck, Water Truck, and Flatbed= Off-highway Truck.

Off-road Equipment - Equipment info based on Constructability Analysis report.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Equipment info based on Constructability Analysis report.

Off-road Equipment - Equipment info based on Constructability Analysis, Table 2. Chipper = generator set. Water truck, flatbed truck = off-highway truck.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Flatbed Truck and Water Truck = Off-highway Truck.

Off-road Equipment - flatbed and water truck = off-highway truck.

Trips and VMT - Trip and VMT details based on Constructability Analysis report.

Grading -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Area Coating -

Energy Use -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	0	72092
tblAreaCoating	Area_Nonresidential_Interior	0	216276
tblAreaCoating	Area_Parking	6011	601
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		MSE Wall Dam Raise
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	7.00	8.00

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tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
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tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblProjectCharacteristics	OperationalYear	2018	2023
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	0.00	11.00
tblTripsAndVMT	VendorTripNumber	0.00	7.00
tblTripsAndVMT	VendorTripNumber	0.00	9.00
tblTripsAndVMT	VendorTripNumber	16.00	7.00
tblTripsAndVMT	VendorTripNumber	16.00	13.00
tblTripsAndVMT	VendorTripNumber	16.00	41.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00

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tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripNumber	23.00	28.00
tblTripsAndVMT	WorkerTripNumber	10.00	20.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	20.00	24.00
tblTripsAndVMT	WorkerTripNumber	42.00	24.00
tblTripsAndVMT	WorkerTripNumber	42.00	28.00
tblTripsAndVMT	WorkerTripNumber	42.00	20.00

2.0 Emissions Summary

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2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0867	0.8109	0.6762	1.8800e-003							0.0000	166.8060	166.8060	0.0441	0.0000	167.9093
2022	0.4157	3.5415	3.7071	0.0111							0.0000	984.4265	984.4265	0.2605	0.0000	990.9396
2023	0.1748	1.4899	1.4562	6.2800e-003							0.0000	572.4952	572.4952	0.1205	0.0000	575.5071
Maximum	0.4157	3.5415	3.7071	0.0111							0.0000	984.4265	984.4265	0.2605	0.0000	990.9396

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0867	0.8109	0.6762	1.8800e-003							0.0000	166.8058	166.8058	0.0441	0.0000	167.9091
2022	0.4157	3.5415	3.7071	0.0111							0.0000	984.4255	984.4255	0.2605	0.0000	990.9386
2023	0.1748	1.4899	1.4562	6.2800e-003							0.0000	572.4948	572.4948	0.1205	0.0000	575.5067
Maximum	0.4157	3.5415	3.7071	0.0111							0.0000	984.4255	984.4255	0.2605	0.0000	990.9386

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	10-1-2021	12-31-2021	0.6354	0.6354
2	1-1-2022	3-31-2022	0.5129	0.5129
		Highest	0.6354	0.6354

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1739	0.0000	2.0000e-005	0.0000							0.0000	4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.1739	0.0000	2.0000e-005	0.0000							0.0000	4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005

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2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1739	0.0000	2.0000e-005	0.0000							0.0000	4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.1739	0.0000	2.0000e-005	0.0000							0.0000	4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Site Preparation	10/1/2021	10/31/2021	5	21	
2	Selective Site Demolition	Demolition	11/1/2021	2/28/2022	5	86	
3	Demobilization/Reclamation	Site Preparation	9/1/2023	9/30/2023	5	21	
4	Excavation for Chute Deepening	Trenching	3/1/2022	8/31/2022	5	132	
5	Rock Stabilization/Permanent Facing	Building Construction	3/1/2022	12/31/2022	5	219	
6	MSE Wall Dam Raise	Building Construction	9/1/2022	12/31/2022	5	87	
7	Chute Lining	Building Construction	1/1/2023	8/31/2023	5	174	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 2.3

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Concrete/Industrial Saws	0	8.00	81	0.73
Mobilization	Dumpers/Tenders	1	4.00	16	0.38
Mobilization	Excavators	1	4.00	158	0.38
Mobilization	Generator Sets	1	4.00	84	0.74
Mobilization	Graders	1	4.00	187	0.41
Mobilization	Off-Highway Trucks	2	8.00	402	0.38
Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Mobilization	Tractors/Loaders/Backhoes	1	4.00	97	0.37

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Selective Site Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Selective Site Demolition	Cranes	1	8.00	231	0.29
Selective Site Demolition	Dumpers/Tenders	2	8.00	16	0.38
Selective Site Demolition	Excavators	2	8.00	158	0.38
Selective Site Demolition	Off-Highway Trucks	2	8.00	402	0.38
Selective Site Demolition	Rubber Tired Dozers	0	8.00	247	0.40
Selective Site Demolition	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demobilization/Reclamation	Dumpers/Tenders	1	8.00	16	0.38
Demobilization/Reclamation	Off-Highway Trucks	2	8.00	402	0.38
Demobilization/Reclamation	Rubber Tired Dozers	0	8.00	247	0.40
Demobilization/Reclamation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Excavation for Chute Deepening	Aerial Lifts	1	4.00	63	0.31
Excavation for Chute Deepening	Cranes	0	0.00	231	0.29
Excavation for Chute Deepening	Dumpers/Tenders	2	8.00	16	0.38
Excavation for Chute Deepening	Excavators	1	4.00	158	0.38
Excavation for Chute Deepening	Excavators	1	8.00	158	0.38
Excavation for Chute Deepening	Off-Highway Trucks	1	4.00	402	0.38
Excavation for Chute Deepening	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Rock Stabilization/Permanent Facing	Aerial Lifts	1	8.00	63	0.31
Rock Stabilization/Permanent Facing	Bore/Drill Rigs	1	8.00	221	0.50
Rock Stabilization/Permanent Facing	Off-Highway Trucks	2	8.00	402	0.38

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Rock Stabilization/Permanent Facing	Tractors/Loaders/Backhoes	1	8.00	97	0.37
MSE Wall Dam Raise	Cranes	0	7.00	231	0.29
MSE Wall Dam Raise	Forklifts	0	8.00	89	0.20
MSE Wall Dam Raise	Generator Sets	0	8.00	84	0.74
MSE Wall Dam Raise	Off-Highway Tractors	1	8.00	124	0.44
MSE Wall Dam Raise	Off-Highway Trucks	2	8.00	402	0.38
MSE Wall Dam Raise	Pavers	1	8.00	130	0.42
MSE Wall Dam Raise	Plate Compactors	4	8.00	8	0.43
MSE Wall Dam Raise	Rollers	2	8.00	80	0.38
MSE Wall Dam Raise	Tractors/Loaders/Backhoes	1	8.00	97	0.37
MSE Wall Dam Raise	Welders	0	8.00	46	0.45
Chute Lining	Cranes	0	8.00	231	0.29
Chute Lining	Excavators	1	8.00	158	0.38
Chute Lining	Forklifts	0	8.00	89	0.20
Chute Lining	Generator Sets	0	8.00	84	0.74
Chute Lining	Off-Highway Tractors	1	2.00	124	0.44
Chute Lining	Off-Highway Trucks	1	4.00	402	0.38
Chute Lining	Off-Highway Trucks	2	8.00	402	0.38
Chute Lining	Plate Compactors	2	4.00	8	0.43
Chute Lining	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Chute Lining	Welders	0	8.00	46	0.45
Demobilization/Reclamation	Generator Sets	2	4.00	84	0.74

Trips and VMT

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Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	8	20.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Selective Site Demolition	9	28.00	11.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	20.00	7.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Excavation for Chute Deepening	8	24.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Rock Stabilization/Permanent MSE Wall Dam Raise	5	24.00	7.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
MSE Wall Dam Raise	9	28.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Chute Lining	7	20.00	41.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

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3.2 Mobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0215	0.2019	0.1584	4.3000e-004							0.0000	37.3523	37.3523	0.0112	0.0000	37.6326
Total	0.0215	0.2019	0.1584	4.3000e-004							0.0000	37.3523	37.3523	0.0112	0.0000	37.6326

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.2000e-004	0.0157	4.3600e-003	6.0000e-005							0.0000	5.6318	5.6318	3.5000e-004	0.0000	5.6406
Worker	1.1800e-003	8.2000e-004	8.7500e-003	3.0000e-005							0.0000	2.5706	2.5706	6.0000e-005	0.0000	2.5722
Total	1.7000e-003	0.0165	0.0131	9.0000e-005							0.0000	8.2024	8.2024	4.1000e-004	0.0000	8.2127

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3.2 Mobilization - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0215	0.2019	0.1584	4.3000e-004							0.0000	37.3523	37.3523	0.0112	0.0000	37.6325
Total	0.0215	0.2019	0.1584	4.3000e-004							0.0000	37.3523	37.3523	0.0112	0.0000	37.6325

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.2000e-004	0.0157	4.3600e-003	6.0000e-005							0.0000	5.6318	5.6318	3.5000e-004	0.0000	5.6406
Worker	1.1800e-003	8.2000e-004	8.7500e-003	3.0000e-005							0.0000	2.5706	2.5706	6.0000e-005	0.0000	2.5722
Total	1.7000e-003	0.0165	0.0131	9.0000e-005							0.0000	8.2024	8.2024	4.1000e-004	0.0000	8.2127

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3.3 Selective Site Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0586	0.5491	0.4670	1.1300e-003							0.0000	98.7894	98.7894	0.0314	0.0000	99.5747
Total	0.0586	0.5491	0.4670	1.1300e-003							0.0000	98.7894	98.7894	0.0314	0.0000	99.5747

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.3500e-003	0.0410	0.0114	1.5000e-004							0.0000	14.7501	14.7501	9.1000e-004	0.0000	14.7729
Worker	3.5400e-003	2.4500e-003	0.0263	9.0000e-005							0.0000	7.7118	7.7118	1.9000e-004	0.0000	7.7165
Total	4.8900e-003	0.0435	0.0377	2.4000e-004							0.0000	22.4619	22.4619	1.1000e-003	0.0000	22.4893

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3.3 Selective Site Demolition - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0586	0.5491	0.4670	1.1300e-003							0.0000	98.7892	98.7892	0.0314	0.0000	99.5746
Total	0.0586	0.5491	0.4670	1.1300e-003							0.0000	98.7892	98.7892	0.0314	0.0000	99.5746

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.3500e-003	0.0410	0.0114	1.5000e-004							0.0000	14.7501	14.7501	9.1000e-004	0.0000	14.7729
Worker	3.5400e-003	2.4500e-003	0.0263	9.0000e-005							0.0000	7.7118	7.7118	1.9000e-004	0.0000	7.7165
Total	4.8900e-003	0.0435	0.0377	2.4000e-004							0.0000	22.4619	22.4619	1.1000e-003	0.0000	22.4893

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3.3 Selective Site Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0474	0.4109	0.4120	1.0300e-003							0.0000	90.0330	90.0330	0.0286	0.0000	90.7487
Total	0.0474	0.4109	0.4120	1.0300e-003							0.0000	90.0330	90.0330	0.0286	0.0000	90.7487

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1500e-003	0.0343	9.9700e-003	1.4000e-004							0.0000	13.3098	13.3098	8.1000e-004	0.0000	13.3302
Worker	3.0400e-003	2.0200e-003	0.0221	7.0000e-005							0.0000	6.7678	6.7678	1.5000e-004	0.0000	6.7717
Total	4.1900e-003	0.0363	0.0321	2.1000e-004							0.0000	20.0777	20.0777	9.6000e-004	0.0000	20.1018

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3.3 Selective Site Demolition - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0474	0.4109	0.4120	1.0300e-003							0.0000	90.0329	90.0329	0.0286	0.0000	90.7486
Total	0.0474	0.4109	0.4120	1.0300e-003							0.0000	90.0329	90.0329	0.0286	0.0000	90.7486

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1500e-003	0.0343	9.9700e-003	1.4000e-004							0.0000	13.3098	13.3098	8.1000e-004	0.0000	13.3302
Worker	3.0400e-003	2.0200e-003	0.0221	7.0000e-005							0.0000	6.7678	6.7678	1.5000e-004	0.0000	6.7717
Total	4.1900e-003	0.0363	0.0321	2.1000e-004							0.0000	20.0777	20.0777	9.6000e-004	0.0000	20.1018

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3.4 Demobilization/Reclamation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0177	0.1406	0.1571	4.2000e-004							0.0000	36.6435	36.6435	0.0101	0.0000	36.8952
Total	0.0177	0.1406	0.1571	4.2000e-004							0.0000	36.6435	36.6435	0.0101	0.0000	36.8952

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7000e-004	7.5300e-003	2.9600e-003	4.0000e-005							0.0000	4.2404	4.2404	2.5000e-004	0.0000	4.2466
Worker	1.0500e-003	6.7000e-004	7.4800e-003	3.0000e-005							0.0000	2.3811	2.3811	5.0000e-005	0.0000	2.3824
Total	1.3200e-003	8.2000e-003	0.0104	7.0000e-005							0.0000	6.6215	6.6215	3.0000e-004	0.0000	6.6290

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3.4 Demobilization/Reclamation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0177	0.1406	0.1571	4.2000e-004							0.0000	36.6434	36.6434	0.0101	0.0000	36.8951
Total	0.0177	0.1406	0.1571	4.2000e-004							0.0000	36.6434	36.6434	0.0101	0.0000	36.8951

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.7000e-004	7.5300e-003	2.9600e-003	4.0000e-005							0.0000	4.2404	4.2404	2.5000e-004	0.0000	4.2466
Worker	1.0500e-003	6.7000e-004	7.4800e-003	3.0000e-005							0.0000	2.3811	2.3811	5.0000e-005	0.0000	2.3824
Total	1.3200e-003	8.2000e-003	0.0104	7.0000e-005							0.0000	6.6215	6.6215	3.0000e-004	0.0000	6.6290

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3.5 Excavation for Chute Deepening - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0701	0.6094	0.7977	1.5100e-003							0.0000	131.4349	131.4349	0.0409	0.0000	132.4582
Total	0.0701	0.6094	0.7977	1.5100e-003							0.0000	131.4349	131.4349	0.0409	0.0000	132.4582

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0200e-003	0.0903	0.0263	3.6000e-004							0.0000	35.0600	35.0600	2.1400e-003	0.0000	35.1136
Worker	8.3900e-003	5.5700e-003	0.0611	2.1000e-004							0.0000	18.6764	18.6764	4.2000e-004	0.0000	18.6870
Total	0.0114	0.0959	0.0874	5.7000e-004							0.0000	53.7364	53.7364	2.5600e-003	0.0000	53.8006

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3.5 Excavation for Chute Deepening - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0701	0.6094	0.7977	1.5100e-003							0.0000	131.4347	131.4347	0.0409	0.0000	132.4580
Total	0.0701	0.6094	0.7977	1.5100e-003							0.0000	131.4347	131.4347	0.0409	0.0000	132.4580

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0200e-003	0.0903	0.0263	3.6000e-004							0.0000	35.0600	35.0600	2.1400e-003	0.0000	35.1136
Worker	8.3900e-003	5.5700e-003	0.0611	2.1000e-004							0.0000	18.6764	18.6764	4.2000e-004	0.0000	18.6870
Total	0.0114	0.0959	0.0874	5.7000e-004							0.0000	53.7364	53.7364	2.5600e-003	0.0000	53.8006

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3.6 Rock Stabilization/Permanent Facing - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1623	1.3720	1.3239	4.4500e-003							0.0000	390.9288	390.9288	0.1264	0.0000	394.0897
Total	0.1623	1.3720	1.3239	4.4500e-003							0.0000	390.9288	390.9288	0.1264	0.0000	394.0897

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.9000e-003	0.1165	0.0339	4.6000e-004							0.0000	45.2416	45.2416	2.7700e-003	0.0000	45.3107
Worker	0.0139	9.2400e-003	0.1014	3.4000e-004							0.0000	30.9858	30.9858	7.0000e-004	0.0000	31.0034
Total	0.0178	0.1258	0.1353	8.0000e-004							0.0000	76.2274	76.2274	3.4700e-003	0.0000	76.3141

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3.6 Rock Stabilization/Permanent Facing - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1623	1.3720	1.3239	4.4500e-003							0.0000	390.9283	390.9283	0.1264	0.0000	394.0892
Total	0.1623	1.3720	1.3239	4.4500e-003							0.0000	390.9283	390.9283	0.1264	0.0000	394.0892

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.9000e-003	0.1165	0.0339	4.6000e-004							0.0000	45.2416	45.2416	2.7700e-003	0.0000	45.3107
Worker	0.0139	9.2400e-003	0.1014	3.4000e-004							0.0000	30.9858	30.9858	7.0000e-004	0.0000	31.0034
Total	0.0178	0.1258	0.1353	8.0000e-004							0.0000	76.2274	76.2274	3.4700e-003	0.0000	76.3141

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3.7 MSE Wall Dam Raise - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0933	0.8010	0.8468	2.0100e-003							0.0000	174.2495	174.2495	0.0552	0.0000	175.6285
Total	0.0933	0.8010	0.8468	2.0100e-003							0.0000	174.2495	174.2495	0.0552	0.0000	175.6285

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8800e-003	0.0860	0.0250	3.4000e-004							0.0000	33.3779	33.3779	2.0400e-003	0.0000	33.4289
Worker	6.4500e-003	4.2800e-003	0.0470	1.6000e-004							0.0000	14.3610	14.3610	3.3000e-004	0.0000	14.3692
Total	9.3300e-003	0.0903	0.0720	5.0000e-004							0.0000	47.7389	47.7389	2.3700e-003	0.0000	47.7980

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3.7 MSE Wall Dam Raise - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0933	0.8010	0.8468	2.0100e-003							0.0000	174.2492	174.2492	0.0552	0.0000	175.6283
Total	0.0933	0.8010	0.8468	2.0100e-003							0.0000	174.2492	174.2492	0.0552	0.0000	175.6283

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8800e-003	0.0860	0.0250	3.4000e-004							0.0000	33.3779	33.3779	2.0400e-003	0.0000	33.4289
Worker	6.4500e-003	4.2800e-003	0.0470	1.6000e-004							0.0000	14.3610	14.3610	3.3000e-004	0.0000	14.3692
Total	9.3300e-003	0.0903	0.0720	5.0000e-004							0.0000	47.7389	47.7389	2.3700e-003	0.0000	47.7980

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3.8 Chute Lining - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1337	0.9700	1.0828	3.4700e-003							0.0000	303.7111	303.7111	0.0976	0.0000	306.1518
Total	0.1337	0.9700	1.0828	3.4700e-003							0.0000	303.7111	303.7111	0.0976	0.0000	306.1518

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0133	0.3657	0.1439	2.1000e-003							0.0000	205.7898	205.7898	0.0121	0.0000	206.0914
Worker	8.7000e-003	5.5300e-003	0.0620	2.2000e-004							0.0000	19.7293	19.7293	4.2000e-004	0.0000	19.7397
Total	0.0220	0.3712	0.2059	2.3200e-003							0.0000	225.5191	225.5191	0.0125	0.0000	225.8311

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3.8 Chute Lining - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1337	0.9700	1.0828	3.4700e-003							0.0000	303.7108	303.7108	0.0976	0.0000	306.1515
Total	0.1337	0.9700	1.0828	3.4700e-003							0.0000	303.7108	303.7108	0.0976	0.0000	306.1515

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0133	0.3657	0.1439	2.1000e-003							0.0000	205.7898	205.7898	0.0121	0.0000	206.0914
Worker	8.7000e-003	5.5300e-003	0.0620	2.2000e-004							0.0000	19.7293	19.7293	4.2000e-004	0.0000	19.7397
Total	0.0220	0.3712	0.2059	2.3200e-003							0.0000	225.5191	225.5191	0.0125	0.0000	225.8311

4.0 Operational Detail - Mobile

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4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.593330	0.040945	0.188012	0.107577	0.017981	0.006204	0.019981	0.018142	0.001176	0.001026	0.003857	0.000384	0.001386

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5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1739	0.0000	2.0000e-005	0.0000							0.0000	4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005
Unmitigated	0.1739	0.0000	2.0000e-005	0.0000							0.0000	4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1674										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	6.4800e-003										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	2.0000e-005	0.0000							0.0000	4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005
Total	0.1739	0.0000	2.0000e-005	0.0000							0.0000	4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005

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6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1674										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	6.4800e-003										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	2.0000e-005	0.0000							0.0000	4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005
Total	0.1739	0.0000	2.0000e-005	0.0000							0.0000	4.0000e-005	4.0000e-005	0.0000	0.0000	4.0000e-005

7.0 Water Detail

7.1 Mitigation Measures Water

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	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

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7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

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8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

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

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number
----------------	--------

11.0 Vegetation

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**Santa Felicia Dam Spillway Imp Alt 2A
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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	5.79	Acre	5.79	252,212.40	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

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Project Characteristics - Start of construction based on the schedule provided in the Constructability Analysis report.

Land Use - Acreage based on Constructability Analysis figures.

Construction Phase - Schedule based on Constructability Analysis, Table 3-1.

Off-road Equipment - Concrete Pump Truck, Water Truck, and Flatbed= Off-highway Truck.

Off-road Equipment - Flatbed, concrete pump truck, and water truck = Off-highway truck

Off-road Equipment - Water Truck= Off-highway truck, Compactor - off-highway tractor.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Water truck= off-highway truck

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Equipment info based on Constructability Analysis, Table 2. Chipper = generator set. Water truck, flatbed truck = off-highway truck.

Off-road Equipment - flatbed and water truck = off-highway truck.

Off-road Equipment - Water truck and concrete pump truck = off-highway truck

Trips and VMT - Trip count taken from Constructability Analysis report. It is assumed that workers and vendors will be coming from the cities of Castaic and Santa Clarita, roughly 20 miles to the east.

Grading -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Area Coating -

Energy Use -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	0	72092
tblAreaCoating	Area_Nonresidential_Interior	0	216276
tblAreaCoating	Area_Parking	15133	601
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0

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tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
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tblOffRoadEquipment	OffRoadEquipmentType		Rollers
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tblOffRoadEquipment	UsageHours	7.00	8.00

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tblOffRoadEquipment	UsageHours	7.00	8.00
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2.0 Emissions Summary

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2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0823	0.7675	0.6237	1.6900e-003							0.0000	150.9696	150.9696	0.0365	0.0000	151.8810
2022	0.4379	4.0124	3.7376	0.0117							0.0000	1,048.0098	1,048.0098	0.2463	0.0000	1,054.1679
2023	0.3801	3.3017	3.1686	0.0111							0.0000	1,000.6042	1,000.6042	0.2428	0.0000	1,006.6731
Maximum	0.4379	4.0124	3.7376	0.0117							0.0000	1,048.0098	1,048.0098	0.2463	0.0000	1,054.1679

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0823	0.7675	0.6237	1.6900e-003							0.0000	150.9694	150.9694	0.0365	0.0000	151.8809
2022	0.4379	4.0124	3.7376	0.0117							0.0000	1,048.0089	1,048.0089	0.2463	0.0000	1,054.1671
2023	0.3801	3.3017	3.1686	0.0111							0.0000	1,000.6034	1,000.6034	0.2428	0.0000	1,006.6723
Maximum	0.4379	4.0124	3.7376	0.0117							0.0000	1,048.0089	1,048.0089	0.2463	0.0000	1,054.1671

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
2	1-1-2022	3-31-2022	0.5195	0.5195
3	4-1-2022	6-30-2022	0.5356	0.5356
		Highest	0.5356	0.5356

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1837	0.0000	5.0000e-005	0.0000							0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.1000e-004
Energy	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.1837	0.0000	5.0000e-005	0.0000							0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.1000e-004

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2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1837	0.0000	5.0000e-005	0.0000							0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.1000e-004
Energy	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.1837	0.0000	5.0000e-005	0.0000							0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.1000e-004

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Site Preparation	10/1/2021	10/31/2021	5	21	
2	Access Road Realignment	Paving	11/1/2021	1/31/2022	5	66	
3	Selective Site Demolition	Demolition	2/1/2022	5/31/2022	5	86	
4	Excavation for Chute Widening	Trenching	3/1/2022	8/31/2022	5	132	
5	Training Walls and Chute Lining	Building Construction	9/1/2022	4/30/2023	5	172	
6	Labyrinth Weir	Building Construction	9/1/2022	4/30/2023	5	172	
7	Bridge Pier and Abutment	Building Construction	1/2/2023	4/30/2023	5	85	
8	Access Bridge	Building Construction	5/1/2023	8/31/2023	5	89	
9	Demobilization/Reclamation	Site Preparation	9/1/2023	9/30/2023	5	21	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 5.79

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Concrete/Industrial Saws	0	8.00	81	0.73
Mobilization	Dumpers/Tenders	1	8.00	16	0.38
Mobilization	Excavators	1	4.00	158	0.38
Mobilization	Generator Sets	1	4.00	84	0.74
Mobilization	Graders	1	4.00	187	0.41
Mobilization	Off-Highway Trucks	2	8.00	402	0.38
Mobilization	Rubber Tired Dozers	0	8.00	247	0.40

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Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Mobilization	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Access Road Realignment	Cement and Mortar Mixers	0	6.00	9	0.56
Access Road Realignment	Concrete/Industrial Saws	0		81	0.73
Access Road Realignment	Dumpers/Tenders	1	8.00	16	0.38
Access Road Realignment	Excavators	1	8.00	158	0.38
Access Road Realignment	Generator Sets	1	4.00	84	0.74
Access Road Realignment	Graders	1	8.00	187	0.41
Access Road Realignment	Off-Highway Tractors	2	4.00	124	0.44
Access Road Realignment	Off-Highway Trucks	1	8.00	402	0.38
Access Road Realignment	Pavers	0	8.00	130	0.42
Access Road Realignment	Paving Equipment	0	6.00	132	0.36
Access Road Realignment	Rollers	0	6.00	80	0.38
Access Road Realignment	Tractors/Loaders/Backhoes	2	4.00	97	0.37
Access Road Realignment	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Selective Site Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Selective Site Demolition	Cranes	1	8.00	231	0.29
Selective Site Demolition	Dumpers/Tenders	2	8.00	16	0.38
Selective Site Demolition	Excavators	2	8.00	158	0.38
Selective Site Demolition	Off-Highway Trucks	2	8.00	402	0.38
Selective Site Demolition	Rubber Tired Dozers	0	8.00	247	0.40
Selective Site Demolition	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Excavation for Chute Widening	Aerial Lifts	1	4.00	63	0.31
Excavation for Chute Widening	Cranes	1	4.00	231	0.29
Excavation for Chute Widening	Dumpers/Tenders	4	8.00	16	0.38
Excavation for Chute Widening	Excavators	1	4.00	158	0.38
Excavation for Chute Widening	Excavators	2	8.00	158	0.38

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Excavation for Chute Widening	Off-Highway Trucks	1	8.00	402	0.38
Excavation for Chute Widening	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Training Walls and Chute Lining	Cranes	1	8.00	231	0.29
Training Walls and Chute Lining	Forklifts	0	8.00	89	0.20
Training Walls and Chute Lining	Generator Sets	0	8.00	84	0.74
Training Walls and Chute Lining	Off-Highway Trucks	1	4.00	402	0.38
Training Walls and Chute Lining	Off-Highway Trucks	1	8.00	402	0.38
Training Walls and Chute Lining	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Training Walls and Chute Lining	Welders	0	8.00	46	0.45
Labyrinth Weir	Cranes	1	2.00	231	0.29
Labyrinth Weir	Forklifts	0	8.00	89	0.20
Labyrinth Weir	Generator Sets	0	8.00	84	0.74
Labyrinth Weir	Off-Highway Tractors	1	4.00	124	0.44
Labyrinth Weir	Off-Highway Trucks	2	8.00	402	0.38
Labyrinth Weir	Off-Highway Trucks	1	4.00	402	0.38
Labyrinth Weir	Pavers	0	8.00	130	0.42
Labyrinth Weir	Plate Compactors	4	4.00	8	0.43
Labyrinth Weir	Rollers	0	8.00	80	0.38
Labyrinth Weir	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Labyrinth Weir	Welders	0	8.00	46	0.45
Bridge Pier and Abutment	Cranes	1	8.00	231	0.29
Bridge Pier and Abutment	Forklifts	0	8.00	89	0.20
Bridge Pier and Abutment	Generator Sets	0	8.00	84	0.74
Bridge Pier and Abutment	Off-Highway Trucks	1	4.00	402	0.38
Bridge Pier and Abutment	Off-Highway Trucks	2	8.00	402	0.38
Bridge Pier and Abutment	Pavers	1	8.00	130	0.42
Bridge Pier and Abutment	Rollers	1	8.00	80	0.38

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Bridge Pier and Abutment	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Bridge Pier and Abutment	Welders	0	8.00	46	0.45
Access Bridge	Cranes	1	8.00	231	0.29
Access Bridge	Excavators	1	8.00	158	0.38
Access Bridge	Forklifts	0	8.00	89	0.20
Access Bridge	Generator Sets	0	8.00	84	0.74
Access Bridge	Off-Highway Trucks	1	4.00	402	0.38
Access Bridge	Off-Highway Trucks	2	8.00	402	0.38
Access Bridge	Pavers	1	8.00	130	0.42
Access Bridge	Rollers	1	8.00	80	0.38
Access Bridge	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Access Bridge	Welders	0	8.00	46	0.45
Demobilization/Reclamation	Dumpers/Tenders	1	8.00	16	0.38
Demobilization/Reclamation	Off-Highway Trucks	2	8.00	402	0.38
Demobilization/Reclamation	Rubber Tired Dozers	0	8.00	247	0.40
Demobilization/Reclamation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Generator Sets	2	4.00	84	0.74
Demobilization/Reclamation	Pavers	1	8.00	130	0.42
Demobilization/Reclamation	Rollers	1	8.00	80	0.38

Trips and VMT

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Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	9	20.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Access Road Realignment	10	24.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Selective Site Demolition	9	28.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Excavation for Chute Widening	12	28.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Training Walls and Chute Lining	4	24.00	18.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Labyrinth Weir	14	24.00	53.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Bridge Pier and Abutment	7	20.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Access Bridge	8	20.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	20.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

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3.2 Mobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0219	0.2043	0.1597	4.3000e-004							0.0000	37.6426	37.6426	0.0112	0.0000	37.9236
Total	0.0219	0.2043	0.1597	4.3000e-004							0.0000	37.6426	37.6426	0.0112	0.0000	37.9236

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.4000e-004	0.0226	6.2900e-003	8.0000e-005							0.0000	8.1349	8.1349	5.0000e-004	0.0000	8.1475
Worker	1.1800e-003	8.2000e-004	8.7500e-003	3.0000e-005							0.0000	2.5706	2.5706	6.0000e-005	0.0000	2.5722
Total	1.9200e-003	0.0235	0.0150	1.1000e-004							0.0000	10.7055	10.7055	5.6000e-004	0.0000	10.7196

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3.2 Mobilization - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0219	0.2043	0.1597	4.3000e-004							0.0000	37.6425	37.6425	0.0112	0.0000	37.9235
Total	0.0219	0.2043	0.1597	4.3000e-004							0.0000	37.6425	37.6425	0.0112	0.0000	37.9235

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.4000e-004	0.0226	6.2900e-003	8.0000e-005							0.0000	8.1349	8.1349	5.0000e-004	0.0000	8.1475
Worker	1.1800e-003	8.2000e-004	8.7500e-003	3.0000e-005							0.0000	2.5706	2.5706	6.0000e-005	0.0000	2.5722
Total	1.9200e-003	0.0235	0.0150	1.1000e-004							0.0000	10.7055	10.7055	5.6000e-004	0.0000	10.7196

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3.3 Access Road Realignment - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0487	0.4892	0.4130	9.0000e-004							0.0000	78.5796	78.5796	0.0234	0.0000	79.1649
Paving	5.1700e-003										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0539	0.4892	0.4130	9.0000e-004							0.0000	78.5796	78.5796	0.0234	0.0000	79.1649

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.6000e-003	0.0485	0.0135	1.8000e-004							0.0000	17.4319	17.4319	1.0800e-003	0.0000	17.4588
Worker	3.0300e-003	2.1000e-003	0.0225	7.0000e-005							0.0000	6.6101	6.6101	1.6000e-004	0.0000	6.6141
Total	4.6300e-003	0.0506	0.0360	2.5000e-004							0.0000	24.0420	24.0420	1.2400e-003	0.0000	24.0730

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3.3 Access Road Realignment - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0487	0.4892	0.4130	9.0000e-004							0.0000	78.5795	78.5795	0.0234	0.0000	79.1648
Paving	5.1700e-003										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0539	0.4892	0.4130	9.0000e-004							0.0000	78.5795	78.5795	0.0234	0.0000	79.1648

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.6000e-003	0.0485	0.0135	1.8000e-004							0.0000	17.4319	17.4319	1.0800e-003	0.0000	17.4588
Worker	3.0300e-003	2.1000e-003	0.0225	7.0000e-005							0.0000	6.6101	6.6101	1.6000e-004	0.0000	6.6141
Total	4.6300e-003	0.0506	0.0360	2.5000e-004							0.0000	24.0420	24.0420	1.2400e-003	0.0000	24.0730

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3.3 Access Road Realignment - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0203	0.1941	0.1886	4.2000e-004							0.0000	36.6747	36.6747	0.0109	0.0000	36.9477
Paving	2.4100e-003										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0227	0.1941	0.1886	4.2000e-004							0.0000	36.6747	36.6747	0.0109	0.0000	36.9477

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.9000e-004	0.0208	6.0300e-003	8.0000e-005							0.0000	8.0567	8.0567	4.9000e-004	0.0000	8.0690
Worker	1.3300e-003	8.9000e-004	9.7200e-003	3.0000e-005							0.0000	2.9713	2.9713	7.0000e-005	0.0000	2.9729
Total	2.0200e-003	0.0216	0.0158	1.1000e-004							0.0000	11.0280	11.0280	5.6000e-004	0.0000	11.0420

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3.3 Access Road Realignment - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0203	0.1941	0.1886	4.2000e-004							0.0000	36.6747	36.6747	0.0109	0.0000	36.9476
Paving	2.4100e-003										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0227	0.1941	0.1886	4.2000e-004							0.0000	36.6747	36.6747	0.0109	0.0000	36.9476

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.9000e-004	0.0208	6.0300e-003	8.0000e-005							0.0000	8.0567	8.0567	4.9000e-004	0.0000	8.0690
Worker	1.3300e-003	8.9000e-004	9.7200e-003	3.0000e-005							0.0000	2.9713	2.9713	7.0000e-005	0.0000	2.9729
Total	2.0200e-003	0.0216	0.0158	1.1000e-004							0.0000	11.0280	11.0280	5.6000e-004	0.0000	11.0420

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3.4 Selective Site Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0994	0.8620	0.8642	2.1600e-003							0.0000	188.8497	188.8497	0.0601	0.0000	190.3510
Total	0.0994	0.8620	0.8642	2.1600e-003							0.0000	188.8497	188.8497	0.0601	0.0000	190.3510

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8400e-003	0.0850	0.0247	3.4000e-004							0.0000	32.9942	32.9942	2.0200e-003	0.0000	33.0446
Worker	6.3800e-003	4.2300e-003	0.0464	1.6000e-004							0.0000	14.1960	14.1960	3.2000e-004	0.0000	14.2040
Total	9.2200e-003	0.0892	0.0712	5.0000e-004							0.0000	47.1901	47.1901	2.3400e-003	0.0000	47.2486

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3.4 Selective Site Demolition - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0994	0.8620	0.8642	2.1600e-003							0.0000	188.8495	188.8495	0.0601	0.0000	190.3507
Total	0.0994	0.8620	0.8642	2.1600e-003							0.0000	188.8495	188.8495	0.0601	0.0000	190.3507

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8400e-003	0.0850	0.0247	3.4000e-004							0.0000	32.9942	32.9942	2.0200e-003	0.0000	33.0446
Worker	6.3800e-003	4.2300e-003	0.0464	1.6000e-004							0.0000	14.1960	14.1960	3.2000e-004	0.0000	14.2040
Total	9.2200e-003	0.0892	0.0712	5.0000e-004							0.0000	47.1901	47.1901	2.3400e-003	0.0000	47.2486

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3.5 Excavation for Chute Widening - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1229	1.0585	1.2190	2.5800e-003							0.0000	223.6893	223.6893	0.0692	0.0000	225.4191
Total	0.1229	1.0585	1.2190	2.5800e-003							0.0000	223.6893	223.6893	0.0692	0.0000	225.4191

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0200e-003	0.0903	0.0263	3.6000e-004							0.0000	35.0600	35.0600	2.1400e-003	0.0000	35.1136
Worker	9.7900e-003	6.5000e-003	0.0713	2.4000e-004							0.0000	21.7891	21.7891	4.9000e-004	0.0000	21.8015
Total	0.0128	0.0968	0.0975	6.0000e-004							0.0000	56.8492	56.8492	2.6300e-003	0.0000	56.9151

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3.5 Excavation for Chute Widening - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1229	1.0585	1.2190	2.5800e-003							0.0000	223.6890	223.6890	0.0692	0.0000	225.4188
Total	0.1229	1.0585	1.2190	2.5800e-003							0.0000	223.6890	223.6890	0.0692	0.0000	225.4188

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0200e-003	0.0903	0.0263	3.6000e-004							0.0000	35.0600	35.0600	2.1400e-003	0.0000	35.1136
Worker	9.7900e-003	6.5000e-003	0.0713	2.4000e-004							0.0000	21.7891	21.7891	4.9000e-004	0.0000	21.8015
Total	0.0128	0.0968	0.0975	6.0000e-004							0.0000	56.8492	56.8492	2.6300e-003	0.0000	56.9151

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3.6 Training Walls and Chute Lining - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0579	0.5168	0.3988	1.2500e-003							0.0000	109.6485	109.6485	0.0355	0.0000	110.5351
Total	0.0579	0.5168	0.3988	1.2500e-003							0.0000	109.6485	109.6485	0.0355	0.0000	110.5351

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.9800e-003	0.1191	0.0346	4.7000e-004							0.0000	46.2155	46.2155	2.8200e-003	0.0000	46.2861
Worker	5.5300e-003	3.6700e-003	0.0403	1.4000e-004							0.0000	12.3094	12.3094	2.8000e-004	0.0000	12.3164
Total	9.5100e-003	0.1227	0.0749	6.1000e-004							0.0000	58.5249	58.5249	3.1000e-003	0.0000	58.6025

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3.6 Training Walls and Chute Lining - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0579	0.5168	0.3988	1.2500e-003							0.0000	109.6484	109.6484	0.0355	0.0000	110.5350
Total	0.0579	0.5168	0.3988	1.2500e-003							0.0000	109.6484	109.6484	0.0355	0.0000	110.5350

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.9800e-003	0.1191	0.0346	4.7000e-004							0.0000	46.2155	46.2155	2.8200e-003	0.0000	46.2861
Worker	5.5300e-003	3.6700e-003	0.0403	1.4000e-004							0.0000	12.3094	12.3094	2.8000e-004	0.0000	12.3164
Total	9.5100e-003	0.1227	0.0749	6.1000e-004							0.0000	58.5249	58.5249	3.1000e-003	0.0000	58.6025

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3.6 Training Walls and Chute Lining - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0535	0.4549	0.3824	1.2200e-003							0.0000	107.1927	107.1927	0.0347	0.0000	108.0594
Total	0.0535	0.4549	0.3824	1.2200e-003							0.0000	107.1927	107.1927	0.0347	0.0000	108.0594

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8500e-003	0.0784	0.0309	4.5000e-004							0.0000	44.1349	44.1349	2.5900e-003	0.0000	44.1996
Worker	5.1000e-003	3.2400e-003	0.0364	1.3000e-004							0.0000	11.5654	11.5654	2.5000e-004	0.0000	11.5716
Total	7.9500e-003	0.0817	0.0672	5.8000e-004							0.0000	55.7003	55.7003	2.8400e-003	0.0000	55.7712

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3.6 Training Walls and Chute Lining - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0535	0.4549	0.3824	1.2200e-003							0.0000	107.1926	107.1926	0.0347	0.0000	108.0593
Total	0.0535	0.4549	0.3824	1.2200e-003							0.0000	107.1926	107.1926	0.0347	0.0000	108.0593

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8500e-003	0.0784	0.0309	4.5000e-004							0.0000	44.1349	44.1349	2.5900e-003	0.0000	44.1996
Worker	5.1000e-003	3.2400e-003	0.0364	1.3000e-004							0.0000	11.5654	11.5654	2.5000e-004	0.0000	11.5716
Total	7.9500e-003	0.0817	0.0672	5.8000e-004							0.0000	55.7003	55.7003	2.8400e-003	0.0000	55.7712

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3.7 Labyrinth Weir - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0842	0.6965	0.6655	1.9100e-003							0.0000	167.1670	167.1670	0.0535	0.0000	168.5037
Total	0.0842	0.6965	0.6655	1.9100e-003							0.0000	167.1670	167.1670	0.0535	0.0000	168.5037

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0117	0.3505	0.1019	1.3900e-003							0.0000	136.0789	136.0789	8.3200e-003	0.0000	136.2869
Worker	5.5300e-003	3.6700e-003	0.0403	1.4000e-004							0.0000	12.3094	12.3094	2.8000e-004	0.0000	12.3164
Total	0.0173	0.3542	0.1422	1.5300e-003							0.0000	148.3884	148.3884	8.6000e-003	0.0000	148.6033

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3.7 Labyrinth Weir - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0842	0.6965	0.6655	1.9100e-003							0.0000	167.1668	167.1668	0.0535	0.0000	168.5035
Total	0.0842	0.6965	0.6655	1.9100e-003							0.0000	167.1668	167.1668	0.0535	0.0000	168.5035

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0117	0.3505	0.1019	1.3900e-003							0.0000	136.0789	136.0789	8.3200e-003	0.0000	136.2869
Worker	5.5300e-003	3.6700e-003	0.0403	1.4000e-004							0.0000	12.3094	12.3094	2.8000e-004	0.0000	12.3164
Total	0.0173	0.3542	0.1422	1.5300e-003							0.0000	148.3884	148.3884	8.6000e-003	0.0000	148.6033

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3.7 Labyrinth Weir - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0777	0.6080	0.6407	1.8700e-003							0.0000	163.4405	163.4405	0.0523	0.0000	164.7474
Total	0.0777	0.6080	0.6407	1.8700e-003							0.0000	163.4405	163.4405	0.0523	0.0000	164.7474

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.4000e-003	0.2309	0.0908	1.3300e-003							0.0000	129.9528	129.9528	7.6200e-003	0.0000	130.1432
Worker	5.1000e-003	3.2400e-003	0.0364	1.3000e-004							0.0000	11.5654	11.5654	2.5000e-004	0.0000	11.5716
Total	0.0135	0.2342	0.1272	1.4600e-003							0.0000	141.5182	141.5182	7.8700e-003	0.0000	141.7148

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3.7 Labyrinth Weir - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0777	0.6080	0.6407	1.8700e-003							0.0000	163.4403	163.4403	0.0523	0.0000	164.7472
Total	0.0777	0.6080	0.6407	1.8700e-003							0.0000	163.4403	163.4403	0.0523	0.0000	164.7472

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.4000e-003	0.2309	0.0908	1.3300e-003							0.0000	129.9528	129.9528	7.6200e-003	0.0000	130.1432
Worker	5.1000e-003	3.2400e-003	0.0364	1.3000e-004							0.0000	11.5654	11.5654	2.5000e-004	0.0000	11.5716
Total	0.0135	0.2342	0.1272	1.4600e-003							0.0000	141.5182	141.5182	7.8700e-003	0.0000	141.7148

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3.8 Bridge Pier and Abutment - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0896	0.7550	0.7235	2.0900e-003							0.0000	183.8875	183.8875	0.0595	0.0000	185.3743
Total	0.0896	0.7550	0.7235	2.0900e-003							0.0000	183.8875	183.8875	0.0595	0.0000	185.3743

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0600e-003	0.0566	0.0223	3.3000e-004							0.0000	31.8752	31.8752	1.8700e-003	0.0000	31.9219
Worker	4.2500e-003	2.7000e-003	0.0303	1.1000e-004							0.0000	9.6379	9.6379	2.0000e-004	0.0000	9.6430
Total	6.3100e-003	0.0593	0.0526	4.4000e-004							0.0000	41.5131	41.5131	2.0700e-003	0.0000	41.5649

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3.8 Bridge Pier and Abutment - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0896	0.7550	0.7235	2.0900e-003							0.0000	183.8873	183.8873	0.0595	0.0000	185.3741
Total	0.0896	0.7550	0.7235	2.0900e-003							0.0000	183.8873	183.8873	0.0595	0.0000	185.3741

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.0600e-003	0.0566	0.0223	3.3000e-004							0.0000	31.8752	31.8752	1.8700e-003	0.0000	31.9219
Worker	4.2500e-003	2.7000e-003	0.0303	1.1000e-004							0.0000	9.6379	9.6379	2.0000e-004	0.0000	9.6430
Total	6.3100e-003	0.0593	0.0526	4.4000e-004							0.0000	41.5131	41.5131	2.0700e-003	0.0000	41.5649

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3.9 Access Bridge - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1022	0.8594	0.9025	2.4200e-003							0.0000	212.7302	212.7302	0.0688	0.0000	214.4502
Total	0.1022	0.8594	0.9025	2.4200e-003							0.0000	212.7302	212.7302	0.0688	0.0000	214.4502

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.1600e-003	0.0593	0.0233	3.4000e-004							0.0000	33.3752	33.3752	1.9600e-003	0.0000	33.4241
Worker	4.4500e-003	2.8300e-003	0.0317	1.1000e-004							0.0000	10.0914	10.0914	2.1000e-004	0.0000	10.0968
Total	6.6100e-003	0.0621	0.0551	4.5000e-004							0.0000	43.4666	43.4666	2.1700e-003	0.0000	43.5209

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3.9 Access Bridge - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1022	0.8594	0.9025	2.4200e-003							0.0000	212.7299	212.7299	0.0688	0.0000	214.4499
Total	0.1022	0.8594	0.9025	2.4200e-003							0.0000	212.7299	212.7299	0.0688	0.0000	214.4499

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.1600e-003	0.0593	0.0233	3.4000e-004							0.0000	33.3752	33.3752	1.9600e-003	0.0000	33.4241
Worker	4.4500e-003	2.8300e-003	0.0317	1.1000e-004							0.0000	10.0914	10.0914	2.1000e-004	0.0000	10.0968
Total	6.6100e-003	0.0621	0.0551	4.5000e-004							0.0000	43.4666	43.4666	2.1700e-003	0.0000	43.5209

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3.10 Demobilization/Reclamation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0213	0.1768	0.2062	5.0000e-004							0.0000	43.3220	43.3220	0.0122	0.0000	43.6277
Total	0.0213	0.1768	0.2062	5.0000e-004							0.0000	43.3220	43.3220	0.0122	0.0000	43.6277

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.5000e-004	9.6900e-003	3.8100e-003	6.0000e-005							0.0000	5.4520	5.4520	3.2000e-004	0.0000	5.4600
Worker	1.0500e-003	6.7000e-004	7.4800e-003	3.0000e-005							0.0000	2.3811	2.3811	5.0000e-005	0.0000	2.3824
Total	1.4000e-003	0.0104	0.0113	9.0000e-005							0.0000	7.8331	7.8331	3.7000e-004	0.0000	7.8423

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3.10 Demobilization/Reclamation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0213	0.1768	0.2062	5.0000e-004							0.0000	43.3220	43.3220	0.0122	0.0000	43.6277
Total	0.0213	0.1768	0.2062	5.0000e-004							0.0000	43.3220	43.3220	0.0122	0.0000	43.6277

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.5000e-004	9.6900e-003	3.8100e-003	6.0000e-005							0.0000	5.4520	5.4520	3.2000e-004	0.0000	5.4600
Worker	1.0500e-003	6.7000e-004	7.4800e-003	3.0000e-005							0.0000	2.3811	2.3811	5.0000e-005	0.0000	2.3824
Total	1.4000e-003	0.0104	0.0113	9.0000e-005							0.0000	7.8331	7.8331	3.7000e-004	0.0000	7.8423

4.0 Operational Detail - Mobile

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4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.593330	0.040945	0.188012	0.107577	0.017981	0.006204	0.019981	0.018142	0.001176	0.001026	0.003857	0.000384	0.001386

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5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1837	0.0000	5.0000e-005	0.0000							0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.1000e-004
Unmitigated	0.1837	0.0000	5.0000e-005	0.0000							0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.1000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1674										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0163										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	5.0000e-005	0.0000							0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.1000e-004
Total	0.1837	0.0000	5.0000e-005	0.0000							0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.1000e-004

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6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1674										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0163										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	5.0000e-005	0.0000							0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.1000e-004
Total	0.1837	0.0000	5.0000e-005	0.0000							0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.1000e-004

7.0 Water Detail

7.1 Mitigation Measures Water

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	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

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7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

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8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

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

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10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number
----------------	--------

11.0 Vegetation

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	3.11	Acre	3.11	135,471.60	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.6	Precipitation Freq (Days)	31
Climate Zone	8			Operational Year	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

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Project Characteristics - Start of construction based on the schedule provided in the Constructability Analysis report.

Land Use - Acreage based on Constructability Analysis figures.

Construction Phase - Schedule based on Constructability Analysis, Table 3-1.

Off-road Equipment - Concrete Pump Truck, Water Truck, and Flatbed= Off-highway Truck.

Off-road Equipment - Equipment info based on Constructability Analysis report.

Off-road Equipment - Construction equipment info based on Constructability Analysis report.

Off-road Equipment - Equipment info based on Constructability Analysis report.

Off-road Equipment - Construction equipment info based on Constructability Analysis reports.

Off-road Equipment - Equipment info based on Constructability Analysis, Table 2. Chipper = generator set. Water truck, flatbed truck = off-highway truck.

Off-road Equipment - Flatbed Truck and Water Truck = Off-highway Truck.

Off-road Equipment - flatbed and water truck = off-highway truck.

Trips and VMT - Trip details based on Constructability Analysis report. It is assumed that works and vendors will be coming from the cities of Castaic and Santa Clarita, approximately 20 miles to the east.

Grading -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Area Coating -

Energy Use -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	0	72092
tblAreaCoating	Area_Nonresidential_Interior	0	216276
tblAreaCoating	Area_Parking	8128	601
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Chute Lining
tblOffRoadEquipment	PhaseName		Labyrinth Weir
tblOffRoadEquipment	PhaseName		Demobilization/Reclamation
tblOffRoadEquipment	UsageHours	7.00	2.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00

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tblOffRoadEquipment	UsageHours	8.00	4.00
tblProjectCharacteristics	OperationalYear	2018	2023
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripLength	6.60	20.00
tblTripsAndVMT	VendorTripNumber	0.00	11.00
tblTripsAndVMT	VendorTripNumber	0.00	11.00
tblTripsAndVMT	VendorTripNumber	0.00	13.00
tblTripsAndVMT	VendorTripNumber	0.00	3.00
tblTripsAndVMT	VendorTripNumber	22.00	9.00
tblTripsAndVMT	VendorTripNumber	22.00	53.00
tblTripsAndVMT	VendorTripNumber	22.00	41.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripLength	16.80	20.00
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tblTripsAndVMT	WorkerTripLength	16.80	20.00
tblTripsAndVMT	WorkerTripNumber	23.00	28.00
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tblTripsAndVMT	WorkerTripNumber	10.00	0.00

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tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	10.00	0.00
tblTripsAndVMT	WorkerTripNumber	20.00	24.00
tblTripsAndVMT	WorkerTripNumber	57.00	24.00
tblTripsAndVMT	WorkerTripNumber	57.00	24.00
tblTripsAndVMT	WorkerTripNumber	57.00	20.00

2.0 Emissions Summary

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2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0868	0.8144	0.6772	1.8900e-003							0.0000	168.0575	168.0575	0.0442	0.0000	169.1627
2022	0.4184	3.7144	3.6900	0.0121							0.0000	1,083.0072	1,083.0072	0.2697	0.0000	1,089.7502
2023	0.2641	2.3226	2.2884	9.6700e-003							0.0000	883.4159	883.4159	0.1820	0.0000	887.9658
Maximum	0.4184	3.7144	3.6900	0.0121							0.0000	1,083.0072	1,083.0072	0.2697	0.0000	1,089.7502

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0868	0.8144	0.6772	1.8900e-003							0.0000	168.0573	168.0573	0.0442	0.0000	169.1625
2022	0.4184	3.7144	3.6900	0.0121							0.0000	1,083.0062	1,083.0062	0.2697	0.0000	1,089.7492
2023	0.2641	2.3226	2.2884	9.6700e-003							0.0000	883.4153	883.4153	0.1820	0.0000	887.9652
Maximum	0.4184	3.7144	3.6900	0.0121							0.0000	1,083.0062	1,083.0062	0.2697	0.0000	1,089.7492

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	10-1-2021	12-31-2021	0.6354	0.6354
2	1-1-2022	3-31-2022	0.5129	0.5129
		Highest	0.6354	0.6354

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1762	0.0000	3.0000e-005	0.0000							0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	6.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.1762	0.0000	3.0000e-005	0.0000							0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	6.0000e-005

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2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1762	0.0000	3.0000e-005	0.0000							0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	6.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.1762	0.0000	3.0000e-005	0.0000							0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	6.0000e-005

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Site Preparation	10/1/2021	10/31/2021	5	21	
2	Selective Site Demolition	Demolition	11/1/2021	2/28/2022	5	86	
3	Demobilization/Reclamation	Site Preparation	9/1/2023	9/30/2023	5	21	
4	Excavation for Chute Deepening	Trenching	3/1/2022	8/31/2022	5	132	
5	Rock Stabilization/Permanent Facing	Building Construction	3/1/2022	12/31/2022	5	219	
6	Labyrinth Weir	Building Construction	9/1/2022	4/30/2023	5	172	
7	Chute Lining	Building Construction	1/1/2023	8/31/2023	5	174	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 3.11

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Concrete/Industrial Saws	0	8.00	81	0.73
Mobilization	Dumpers/Tenders	1	4.00	16	0.38
Mobilization	Excavators	1	4.00	158	0.38
Mobilization	Generator Sets	1	4.00	84	0.74
Mobilization	Graders	1	4.00	187	0.41
Mobilization	Off-Highway Trucks	2	8.00	402	0.38
Mobilization	Rubber Tired Dozers	0	8.00	247	0.40
Mobilization	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Mobilization	Tractors/Loaders/Backhoes	1	4.00	97	0.37

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Selective Site Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Selective Site Demolition	Cranes	1	8.00	231	0.29
Selective Site Demolition	Dumpers/Tenders	2	8.00	16	0.38
Selective Site Demolition	Excavators	2	8.00	158	0.38
Selective Site Demolition	Off-Highway Trucks	2	8.00	402	0.38
Selective Site Demolition	Rubber Tired Dozers	0	8.00	247	0.40
Selective Site Demolition	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demobilization/Reclamation	Dumpers/Tenders	0	8.00	16	0.38
Demobilization/Reclamation	Off-Highway Trucks	1	8.00	402	0.38
Demobilization/Reclamation	Rubber Tired Dozers	0	8.00	247	0.40
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demobilization/Reclamation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Excavation for Chute Deepening	Aerial Lifts	1	4.00	63	0.31
Excavation for Chute Deepening	Cranes	0	0.00	231	0.29
Excavation for Chute Deepening	Dumpers/Tenders	2	8.00	16	0.38
Excavation for Chute Deepening	Excavators	1	4.00	158	0.38
Excavation for Chute Deepening	Excavators	1	8.00	158	0.38
Excavation for Chute Deepening	Off-Highway Trucks	1	4.00	402	0.38
Excavation for Chute Deepening	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Rock Stabilization/Permanent Facing	Aerial Lifts	1	8.00	63	0.31
Rock Stabilization/Permanent Facing	Bore/Drill Rigs	1	8.00	221	0.50
Rock Stabilization/Permanent Facing	Off-Highway Trucks	2	8.00	402	0.38

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Rock Stabilization/Permanent Facing	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Labyrinth Weir	Cranes	1	2.00	231	0.29
Labyrinth Weir	Excavators	1	8.00	158	0.38
Labyrinth Weir	Forklifts	0	8.00	89	0.20
Labyrinth Weir	Generator Sets	0	8.00	84	0.74
Labyrinth Weir	Off-Highway Tractors	1	8.00	124	0.44
Labyrinth Weir	Off-Highway Trucks	2	8.00	402	0.38
Labyrinth Weir	Off-Highway Trucks	1	4.00	402	0.38
Labyrinth Weir	Pavers	0	8.00	130	0.42
Labyrinth Weir	Plate Compactors	2	4.00	8	0.43
Labyrinth Weir	Rollers	0	8.00	80	0.38
Labyrinth Weir	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Labyrinth Weir	Welders	0	8.00	46	0.45
Chute Lining	Cranes	0	8.00	231	0.29
Chute Lining	Excavators	1	8.00	158	0.38
Chute Lining	Forklifts	0	8.00	89	0.20
Chute Lining	Generator Sets	0	8.00	84	0.74
Chute Lining	Off-Highway Tractors	1	2.00	124	0.44
Chute Lining	Off-Highway Trucks	1	4.00	402	0.38
Chute Lining	Off-Highway Trucks	2	8.00	402	0.38
Chute Lining	Plate Compactors	2	4.00	8	0.43
Chute Lining	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Chute Lining	Welders	0	8.00	46	0.45
Demobilization/Reclamation	Generator Sets	2	4.00	84	0.74

Trips and VMT

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Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	8	20.00	11.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Selective Site Demolition	9	28.00	11.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	20.00	13.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demobilization/Reclamation	4	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Excavation for Chute Deepening	8	24.00	3.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Rock Stabilization/Permanent Labyrinth Weir	5	24.00	9.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
	9	24.00	53.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT
Chute Lining	7	20.00	41.00	0.00	20.00	20.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

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3.2 Mobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0215	0.2019	0.1584	4.3000e-004							0.0000	37.3523	37.3523	0.0112	0.0000	37.6326
Total	0.0215	0.2019	0.1584	4.3000e-004							0.0000	37.3523	37.3523	0.0112	0.0000	37.6326

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3000e-004	0.0192	5.3200e-003	7.0000e-005							0.0000	6.8834	6.8834	4.3000e-004	0.0000	6.8940
Worker	1.1800e-003	8.2000e-004	8.7500e-003	3.0000e-005							0.0000	2.5706	2.5706	6.0000e-005	0.0000	2.5722
Total	1.8100e-003	0.0200	0.0141	1.0000e-004							0.0000	9.4540	9.4540	4.9000e-004	0.0000	9.4662

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3.2 Mobilization - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0215	0.2019	0.1584	4.3000e-004							0.0000	37.3523	37.3523	0.0112	0.0000	37.6325
Total	0.0215	0.2019	0.1584	4.3000e-004							0.0000	37.3523	37.3523	0.0112	0.0000	37.6325

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3000e-004	0.0192	5.3200e-003	7.0000e-005							0.0000	6.8834	6.8834	4.3000e-004	0.0000	6.8940
Worker	1.1800e-003	8.2000e-004	8.7500e-003	3.0000e-005							0.0000	2.5706	2.5706	6.0000e-005	0.0000	2.5722
Total	1.8100e-003	0.0200	0.0141	1.0000e-004							0.0000	9.4540	9.4540	4.9000e-004	0.0000	9.4662

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3.3 Selective Site Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0586	0.5491	0.4670	1.1300e-003							0.0000	98.7894	98.7894	0.0314	0.0000	99.5747
Total	0.0586	0.5491	0.4670	1.1300e-003							0.0000	98.7894	98.7894	0.0314	0.0000	99.5747

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.3500e-003	0.0410	0.0114	1.5000e-004							0.0000	14.7501	14.7501	9.1000e-004	0.0000	14.7729
Worker	3.5400e-003	2.4500e-003	0.0263	9.0000e-005							0.0000	7.7118	7.7118	1.9000e-004	0.0000	7.7165
Total	4.8900e-003	0.0435	0.0377	2.4000e-004							0.0000	22.4619	22.4619	1.1000e-003	0.0000	22.4893

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3.3 Selective Site Demolition - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0586	0.5491	0.4670	1.1300e-003							0.0000	98.7892	98.7892	0.0314	0.0000	99.5746
Total	0.0586	0.5491	0.4670	1.1300e-003							0.0000	98.7892	98.7892	0.0314	0.0000	99.5746

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.3500e-003	0.0410	0.0114	1.5000e-004							0.0000	14.7501	14.7501	9.1000e-004	0.0000	14.7729
Worker	3.5400e-003	2.4500e-003	0.0263	9.0000e-005							0.0000	7.7118	7.7118	1.9000e-004	0.0000	7.7165
Total	4.8900e-003	0.0435	0.0377	2.4000e-004							0.0000	22.4619	22.4619	1.1000e-003	0.0000	22.4893

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3.3 Selective Site Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0474	0.4109	0.4120	1.0300e-003							0.0000	90.0330	90.0330	0.0286	0.0000	90.7487
Total	0.0474	0.4109	0.4120	1.0300e-003							0.0000	90.0330	90.0330	0.0286	0.0000	90.7487

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1500e-003	0.0343	9.9700e-003	1.4000e-004							0.0000	13.3098	13.3098	8.1000e-004	0.0000	13.3302
Worker	3.0400e-003	2.0200e-003	0.0221	7.0000e-005							0.0000	6.7678	6.7678	1.5000e-004	0.0000	6.7717
Total	4.1900e-003	0.0363	0.0321	2.1000e-004							0.0000	20.0777	20.0777	9.6000e-004	0.0000	20.1018

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3.3 Selective Site Demolition - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0474	0.4109	0.4120	1.0300e-003							0.0000	90.0329	90.0329	0.0286	0.0000	90.7486
Total	0.0474	0.4109	0.4120	1.0300e-003							0.0000	90.0329	90.0329	0.0286	0.0000	90.7486

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1500e-003	0.0343	9.9700e-003	1.4000e-004							0.0000	13.3098	13.3098	8.1000e-004	0.0000	13.3302
Worker	3.0400e-003	2.0200e-003	0.0221	7.0000e-005							0.0000	6.7678	6.7678	1.5000e-004	0.0000	6.7717
Total	4.1900e-003	0.0363	0.0321	2.1000e-004							0.0000	20.0777	20.0777	9.6000e-004	0.0000	20.1018

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3.4 Demobilization/Reclamation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0117	0.0982	0.1199	2.7000e-004							0.0000	23.8715	23.8715	6.0600e-003	0.0000	24.0230
Total	0.0117	0.0982	0.1199	2.7000e-004							0.0000	23.8715	23.8715	6.0600e-003	0.0000	24.0230

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.1000e-004	0.0140	5.5000e-003	8.0000e-005							0.0000	7.8751	7.8751	4.6000e-004	0.0000	7.8866
Worker	1.0500e-003	6.7000e-004	7.4800e-003	3.0000e-005							0.0000	2.3811	2.3811	5.0000e-005	0.0000	2.3824
Total	1.5600e-003	0.0147	0.0130	1.1000e-004							0.0000	10.2562	10.2562	5.1000e-004	0.0000	10.2690

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3.4 Demobilization/Reclamation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0117	0.0982	0.1199	2.7000e-004							0.0000	23.8715	23.8715	6.0600e-003	0.0000	24.0230
Total	0.0117	0.0982	0.1199	2.7000e-004							0.0000	23.8715	23.8715	6.0600e-003	0.0000	24.0230

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.1000e-004	0.0140	5.5000e-003	8.0000e-005							0.0000	7.8751	7.8751	4.6000e-004	0.0000	7.8866
Worker	1.0500e-003	6.7000e-004	7.4800e-003	3.0000e-005							0.0000	2.3811	2.3811	5.0000e-005	0.0000	2.3824
Total	1.5600e-003	0.0147	0.0130	1.1000e-004							0.0000	10.2562	10.2562	5.1000e-004	0.0000	10.2690

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3.5 Excavation for Chute Deepening - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0701	0.6094	0.7977	1.5100e-003							0.0000	131.4349	131.4349	0.0409	0.0000	132.4582
Total	0.0701	0.6094	0.7977	1.5100e-003							0.0000	131.4349	131.4349	0.0409	0.0000	132.4582

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0100e-003	0.0301	8.7500e-003	1.2000e-004							0.0000	11.6867	11.6867	7.1000e-004	0.0000	11.7045
Worker	8.3900e-003	5.5700e-003	0.0611	2.1000e-004							0.0000	18.6764	18.6764	4.2000e-004	0.0000	18.6870
Total	9.4000e-003	0.0357	0.0699	3.3000e-004							0.0000	30.3631	30.3631	1.1300e-003	0.0000	30.3915

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3.5 Excavation for Chute Deepening - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0701	0.6094	0.7977	1.5100e-003							0.0000	131.4347	131.4347	0.0409	0.0000	132.4580
Total	0.0701	0.6094	0.7977	1.5100e-003							0.0000	131.4347	131.4347	0.0409	0.0000	132.4580

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0100e-003	0.0301	8.7500e-003	1.2000e-004							0.0000	11.6867	11.6867	7.1000e-004	0.0000	11.7045
Worker	8.3900e-003	5.5700e-003	0.0611	2.1000e-004							0.0000	18.6764	18.6764	4.2000e-004	0.0000	18.6870
Total	9.4000e-003	0.0357	0.0699	3.3000e-004							0.0000	30.3631	30.3631	1.1300e-003	0.0000	30.3915

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3.6 Rock Stabilization/Permanent Facing - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1623	1.3720	1.3239	4.4500e-003							0.0000	390.9288	390.9288	0.1264	0.0000	394.0897
Total	0.1623	1.3720	1.3239	4.4500e-003							0.0000	390.9288	390.9288	0.1264	0.0000	394.0897

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0100e-003	0.1498	0.0436	6.0000e-004							0.0000	58.1678	58.1678	3.5600e-003	0.0000	58.2566
Worker	0.0139	9.2400e-003	0.1014	3.4000e-004							0.0000	30.9858	30.9858	7.0000e-004	0.0000	31.0034
Total	0.0189	0.1591	0.1449	9.4000e-004							0.0000	89.1536	89.1536	4.2600e-003	0.0000	89.2601

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3.6 Rock Stabilization/Permanent Facing - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1623	1.3720	1.3239	4.4500e-003							0.0000	390.9283	390.9283	0.1264	0.0000	394.0892
Total	0.1623	1.3720	1.3239	4.4500e-003							0.0000	390.9283	390.9283	0.1264	0.0000	394.0892

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0100e-003	0.1498	0.0436	6.0000e-004							0.0000	58.1678	58.1678	3.5600e-003	0.0000	58.2566
Worker	0.0139	9.2400e-003	0.1014	3.4000e-004							0.0000	30.9858	30.9858	7.0000e-004	0.0000	31.0034
Total	0.0189	0.1591	0.1449	9.4000e-004							0.0000	89.1536	89.1536	4.2600e-003	0.0000	89.2601

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3.7 Labyrinth Weir - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0889	0.7368	0.7673	2.0900e-003							0.0000	182.6278	182.6278	0.0588	0.0000	184.0970
Total	0.0889	0.7368	0.7673	2.0900e-003							0.0000	182.6278	182.6278	0.0588	0.0000	184.0970

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0117	0.3505	0.1019	1.3900e-003							0.0000	136.0789	136.0789	8.3200e-003	0.0000	136.2869
Worker	5.5300e-003	3.6700e-003	0.0403	1.4000e-004							0.0000	12.3094	12.3094	2.8000e-004	0.0000	12.3164
Total	0.0173	0.3542	0.1422	1.5300e-003							0.0000	148.3884	148.3884	8.6000e-003	0.0000	148.6033

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3.7 Labyrinth Weir - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0889	0.7368	0.7673	2.0900e-003							0.0000	182.6276	182.6276	0.0588	0.0000	184.0968
Total	0.0889	0.7368	0.7673	2.0900e-003							0.0000	182.6276	182.6276	0.0588	0.0000	184.0968

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0117	0.3505	0.1019	1.3900e-003							0.0000	136.0789	136.0789	8.3200e-003	0.0000	136.2869
Worker	5.5300e-003	3.6700e-003	0.0403	1.4000e-004							0.0000	12.3094	12.3094	2.8000e-004	0.0000	12.3164
Total	0.0173	0.3542	0.1422	1.5300e-003							0.0000	148.3884	148.3884	8.6000e-003	0.0000	148.6033

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3.7 Labyrinth Weir - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0817	0.6344	0.7397	2.0400e-003							0.0000	178.5398	178.5398	0.0575	0.0000	179.9761
Total	0.0817	0.6344	0.7397	2.0400e-003							0.0000	178.5398	178.5398	0.0575	0.0000	179.9761

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.4000e-003	0.2309	0.0908	1.3300e-003							0.0000	129.9528	129.9528	7.6200e-003	0.0000	130.1432
Worker	5.1000e-003	3.2400e-003	0.0364	1.3000e-004							0.0000	11.5654	11.5654	2.5000e-004	0.0000	11.5716
Total	0.0135	0.2342	0.1272	1.4600e-003							0.0000	141.5182	141.5182	7.8700e-003	0.0000	141.7148

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3.7 Labyrinth Weir - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0817	0.6344	0.7397	2.0400e-003							0.0000	178.5396	178.5396	0.0575	0.0000	179.9759
Total	0.0817	0.6344	0.7397	2.0400e-003							0.0000	178.5396	178.5396	0.0575	0.0000	179.9759

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.4000e-003	0.2309	0.0908	1.3300e-003							0.0000	129.9528	129.9528	7.6200e-003	0.0000	130.1432
Worker	5.1000e-003	3.2400e-003	0.0364	1.3000e-004							0.0000	11.5654	11.5654	2.5000e-004	0.0000	11.5716
Total	0.0135	0.2342	0.1272	1.4600e-003							0.0000	141.5182	141.5182	7.8700e-003	0.0000	141.7148

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3.8 Chute Lining - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1337	0.9700	1.0828	3.4700e-003							0.0000	303.7111	303.7111	0.0976	0.0000	306.1518
Total	0.1337	0.9700	1.0828	3.4700e-003							0.0000	303.7111	303.7111	0.0976	0.0000	306.1518

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0133	0.3657	0.1439	2.1000e-003							0.0000	205.7898	205.7898	0.0121	0.0000	206.0914
Worker	8.7000e-003	5.5300e-003	0.0620	2.2000e-004							0.0000	19.7293	19.7293	4.2000e-004	0.0000	19.7397
Total	0.0220	0.3712	0.2059	2.3200e-003							0.0000	225.5191	225.5191	0.0125	0.0000	225.8311

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3.8 Chute Lining - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1337	0.9700	1.0828	3.4700e-003							0.0000	303.7108	303.7108	0.0976	0.0000	306.1515
Total	0.1337	0.9700	1.0828	3.4700e-003							0.0000	303.7108	303.7108	0.0976	0.0000	306.1515

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0133	0.3657	0.1439	2.1000e-003							0.0000	205.7898	205.7898	0.0121	0.0000	206.0914
Worker	8.7000e-003	5.5300e-003	0.0620	2.2000e-004							0.0000	19.7293	19.7293	4.2000e-004	0.0000	19.7397
Total	0.0220	0.3712	0.2059	2.3200e-003							0.0000	225.5191	225.5191	0.0125	0.0000	225.8311

4.0 Operational Detail - Mobile

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4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.593330	0.040945	0.188012	0.107577	0.017981	0.006204	0.019981	0.018142	0.001176	0.001026	0.003857	0.000384	0.001386

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5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000							0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1762	0.0000	3.0000e-005	0.0000							0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	6.0000e-005
Unmitigated	0.1762	0.0000	3.0000e-005	0.0000							0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	6.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1674										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	8.7600e-003										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	3.0000e-005	0.0000							0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	6.0000e-005
Total	0.1762	0.0000	3.0000e-005	0.0000							0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	6.0000e-005

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6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1674										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	8.7600e-003										0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	3.0000e-005	0.0000							0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	6.0000e-005
Total	0.1762	0.0000	3.0000e-005	0.0000							0.0000	6.0000e-005	6.0000e-005	0.0000	0.0000	6.0000e-005

7.0 Water Detail

7.1 Mitigation Measures Water

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	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

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7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

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8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

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

Santa Felicia Dam Spillway Imp Alt 2B - Ventura County, Annual

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number
----------------	--------

11.0 Vegetation

Final Environmental Impact Report
Santa Felicia Dam Safety
Improvement Project

APPENDIX

D

DEIR Public Comments and
Responses

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1. INTRODUCTION

This appendix contains written comments received from state and local agencies, the general public, and Native Americans during the public comment period for the Draft Environmental Impact Report (EIR) for the Santa Felicia Dam Safety Improvement Project.

1.1. COMMENT RECEIPT AND REVIEW

Comment Receipt

Comments on the Draft EIR included written correspondence received during the 45-day public comment period. All written comments submitted to UWCD during that period are included in Section 3 of this appendix.

Comment Review

In accordance with CEQA Guidelines Section 15088, comments were assessed and considered as follows:

- Each comment letter was assigned an identification number. Comment letters were numbered sequentially based on when they were received by UWCD.
- Each comment letter was reviewed carefully. Within each comment, substantive comments were identified, bracketed, and assigned into a category based on technical sections within the EIR. Three guidelines were used for determining substantive comments:
 1. The comment questioned components of the proposed action or alternatives associated with the Santa Felicia Dam Safety Improvement Project;
 2. The methodology of the analysis or results was questioned; or
 3. The use, adequacy, or accuracy of data was questioned.
- The individual bracketed comments were assigned a number, and a response was developed for each comment; associated responses are organized consecutively by number and, to the extent possible, are depicted adjacent to the comment. If the same comment was repeated within the same letter, it was bracketed only the first time it appeared.

2. LIST OF COMMENTERS

Below are the seven federal/state/local agencies, organizations, and individuals that provided comments to the Santa Felicia Dam Safety Improvement Project Draft Environmental Impact Report. Commenters are listed alphabetically followed by the comment letter number in bold.

Avila, Jairo F. - Tribal Historic and Cultural Preservation Officer, Fernandeano Tataviam Band of Mission Indians **1**

Balan, Anitha - Ventura County Public Works Transportation Department **4**

Collazo, Nicole - Ventura County Air Pollution Control District **5**

Edmonson, Miya - California Department of Transportation **7**

Hartzell, Andrew – O’Neil LLP on behalf of Rancho Temescal **3**

McCrea, Wyatt **2**

Wilson, Erinn - California Department of Fish and Wildlife **6**

3. COMMENT LETTERS AND RESPONSES

1

Jim Grisham

From: Maryam Bral
Sent: Thursday, November 29, 2018 4:24 PM
To: Jim Grisham
Subject: FW: FTBMI Comments for Santa Felicia Dam dEIR

FYI
Thanks,
Maryam

From: Jairo Avila [REDACTED]
Sent: Thursday, November 29, 2018 10:32 AM
To: Maryam Bral [REDACTED]
Subject: FTBMI Comments for Santa Felicia Dam dEIR

Tribal Historic & Cultural Preservation Department

Project: *Santa Felicia Dam Safety Improvement Project*
Address: *Santa Felicia Dam*

Hello Maryam,

On behalf of the Tribal Historic and Cultural Preservation (THCP) department of the Fernandefio Tataviam Band of Mission Indians (FTBMI), thank you for the formal notification and opportunity to review the Draft Environmental Impact Report (EIR) for the Santa Felicia Dam Safety Improvement Project.

The project area is located within the traditional Tataviam ancestral territory, which encompasses the lineage-villages from which members of the Tribe descend. Among the number of cultural sites in the region, the Project is surrounded by Tataviam Villages, ceremonial rock shelters containing prehistoric rock art, seasonal occupation sites, tool production/ lithic scatters sites, and human burial sites. The Villages located nearest to the Project include *Piru*, *Camulos*, and *Coyonga* (see map attached). Although the surface expressions of these sites do not overlap the project, the subsurface boundary of known and unknown sites may intersect the project area.

As part of the efforts to improve the safety of the Santa Felicia Dam, the proposed Project plans to replace the existing outlet works system and install a new hydroelectric turbine, and increase the conveyance capacity of the existing spillway to sufficiently pass the IDF. As a result, the Project will require levels of ground disturbing activity and will impact both previously disturbed and undisturbed soil areas.

Based on our review of the draft EIR, there have been several previous cultural resource investigations conducted within the vicinity of the Project. Although there are no recorded archaeological sites within the project area and no cultural resources were identified during the recent cultural survey of the Area of Potential Effect (APE), it is unclear if the APE was ever properly tested for subsurface resources in recent of previous investigations. Therefore, there is still a possibility of inadvertently encountering unidentified cultural resources on the surface and subsurface.

Due to the project's proposed depth of excavation, the areas proximity to known and significant cultural/ archaeological sites, and lack of information about the level of effort undertaken during previous cultural resource

**Comment Letter 1Jairo F. Avila
Fernandefio Tataviam Band of Mission Indians**

Response 1.1

Comment noted. Impact CUL-2 acknowledges that "The Project could result in the destruction of or damage to presently undocumented cultural resources", which is a significant but mitigable to less than significant impact. MM CUL-1: Follow inadvertent discovery procedures, would reduce potentially significant impacts resulting from inadvertent damage or destruction of unknown cultural resources during construction to a less than significant level because appropriate procedures would be followed to ensure that any unanticipated cultural resources discovered during Project-related ground-disturbing activities are appropriately handled and documented and that all appropriate parties are contacted and coordinated with in a timely manner, in order to either avoid or minimize impacts on the cultural resources.

Response 1.2

Comment noted. Please see response to Comment 1.1.

1

2

investigations, the THCP department finds the project as having potential to impact unidentified cultural resources in surface and subsurface settings. As a result, the THCP department recommends that the following mitigation measures be made part projects condition of approval.

- All contractors and earth moving personnel shall be given a Worker Environmental Awareness Program (WEAP) training prior to any ground-disturbing activities to discuss the Project's potential for impacting cultural resources. The training shall be presented by an archaeological representative of the Fernandeano Tataviam Band of Mission Indians (FTBMI) and shall inform personnel of the types of artifacts and features that may be encountered, the procedures to be followed if cultural materials are unearthed at the project site, contact information for the Tribal personnel, and the regulatory requirements for the protection of cultural resources.
- If human remains or funerary objects are encountered during any activities associated with the project, work in the immediate vicinity (within a 60-foot buffer of the find) shall cease and the County coroner shall be contacted. If the human remains prove to be Native American in origin by the County coroner, the applicant shall immediately notify the lead agency, the FTBMI, and consulting Tribes.
- In the event that Native American cultural resources are discovered during Project activities, all work in the immediate vicinity of the find (within a 60-foot buffer) shall cease and a qualified archaeologist meeting Secretary of Interior standards shall assess the find. The Fernandeano Tataviam Band of Mission Indians shall be contacted to consult if any such find occurs. The archaeologist shall complete all relevant California State Department of Parks and Recreation (DPR) 523 Series forms to document the find and submit this documentation to the applicant, Lead Agency, and FTBMI. If the Native American cultural resource is determined to be significant, as defined by consulting Tribes, a Native American archaeological monitor procured by the FTBMI shall be present for all ground disturbing activities that occur within the proposed Project area.
 - The archaeologist and Tribal monitor will have the authority to request ground disturbing activities cease within the area of a discovery to assess potential finds in real time.
 - The Lead Agency and/or applicant shall, in good faith, consult with FTBMI on the disposition and treatment of any artifacts or other cultural materials encountered during the project.

The THCP department looks forward to reviewing the updated EIR and providing comments, as it is important that all of the FTBMI concerns are addressed in the document. Should you have any questions or further updates, please feel free to contact me by phone or email. I appreciate your time and look forward to further updates on this project.

Respectfully,

--

Jairo F. Avila, M.A., RPA,
Tribal Historic and Cultural Preservation Officer

Fernandeano Tataviam Band of Mission Indians
1019 Second Street, Suite 1
San Fernando, California 91340
Office: (818) 837-0794
Website: <http://www.tataviam-nsn.us>

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Response 1.3

MM CUL-1: Follow inadvertent discovery procedures in the DEIR was sufficient to reduce potential impacts to less than significant; however, the following text has been added to the mitigation measure on p. 5.6-12 in consideration of the comment: "All contractors and earth moving personnel shall be given Worker Environmental Awareness Program (WEAP) training by a qualified cultural resources specialist prior to any ground-disturbing activities to discuss the Project's potential for impacting cultural resources. The training shall inform personnel of the types of artifacts and features that may be encountered, the procedures to be followed if cultural materials are unearthed at the project site, contact information for the Tribal personnel, and the regulatory requirements for the protection of cultural resources. A Native American Monitor shall be present for implementation of cultural mitigation measures."

Response 1.4

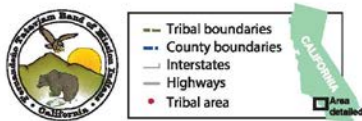
Comment noted. The Project would adhere to California Health and Safety Code Sections 7050.5 and 7052 and California Public Resources Code Section 5097.9, which, as described in Impact CUL-3, outline required procedures (e.g., cessation of work and coroner/archaeologist/NAHC notification) if human remains are encountered, with mitigation provided as MM CUL-1: Follow inadvertent discovery procedures. Therefore, impacts to human remains would be less than significant and additional mitigation is not needed. The following text has been added to MM CUL-1: "A Native American Monitor will be present for implementation of cultural mitigation measures."

Response 1.5

The Project would adhere to California Health and Safety Code Sections 7050.5 and 7052 and California Public Resources Code Section 5097.9, which, as described in Impact CUL-3, outline required procedures (e.g., cessation of work and coroner/archaeologist/NAHC notification) if human remains are encountered. The Project would also implement MM CUL-1: Follow inadvertent discovery procedures, which calls for a qualified cultural resources specialist to be contacted if unrecorded cultural resources are encountered during ground-disturbing activities, followed by cessation of activities, determination of significance, and development of appropriate mitigation. The



Fernandeano Tatabiam Band of Mission Indians Historical Tribal Territory



Tribal boundary depicted is based on registered tribal citizens' ancestral villages. Due to kinship networks and social exchange, this hard boundary does not include all of the abundant locations associated with Tatabiam cultural resources and ancestry. Therefore, the overlap yellow boundary accommodates the natural mobility of ancestral and contemporary Tatabiam people, which are also known to be well associated with the tribe and sensitive cultural resources.

All projects breaking soil within the tribal boundary are subject to Tatabiam jurisdiction, whereas any projects occurring within the yellow boundary may be subject to further analysis by other surrounding Tribal Governments.

following text has been added to MM CUL-1: "All contractors and earth moving personnel shall be given Worker Environmental Awareness Program (WEAP) training by a qualified cultural resources specialist prior to any ground-disturbing activities to discuss the Project's potential for impacting cultural resources. The training shall inform personnel of the types of artifacts and features that may be encountered, the procedures to be followed if cultural materials are unearthed at the project site, contact information for appropriate Tribal personnel, and the regulatory requirements for the protection of cultural resources. A Native American Monitor will be present for implementation of cultural mitigation measures."

2

December 10, 2018

United Water Conservation District
Attn: Maryam Bral, PE
106 N. 8th St.
Santa Paula, CA 93060
(via email; and US Postal delivery)

Dear Ms. Bral

This communication is in response to correspondence received from Engineering Manager, James Grisham, dated November 5, 2018, and in direct relation to the Santa Felicia Dam Safety Improvement Draft EIR. I am also enclosing a copy of a previous letter written to staff in April 2017.

As I am sure you are aware, my wife and I have one of the few full ingress/egress access easements across the spillway, the dam and the east road. This easement is our sole legal and improved access to our property on the east side of Lake Piru. We differ from the other few easement holders in that our property does not just consist of vacant, grazing land but rather is where we maintain a place of residence, as well as various other interests. As such, we have multiple concerns regarding our access during the scope of the proposed project.

We understand the Draft EIR is broad in scope and addresses multiple issues; nevertheless, we were somewhat disappointed to see that the document did not address our situation in any way. Specifically, sections 5.14.3.2; 5.17; and 6.3.13 and .14 make no mention of the potential impact on our daily activities.

Maintaining a home (built in approximately 1925), with the addition of livestock and other agriculture endeavors, in this region requires daily attention. There are flood and drainage maintenance issues during the rainy seasons to keep the premises from potential flooding. There is intensive weed abatement that needs to take place during the spring and summer months, as required by the fire department, to diminish the potential of losing structures in a fire. There are water wells to maintain in order to ensure uninterrupted water supply for both domestic and livestock use. There are lawns and landscaping to keep up. There are pipelines to maintain and trees that need to occasionally be cleared from roadways; fences to maintain to keep livestock in or the neighbors out. There are security concerns with trespassers and the poaching of wildlife among other issues. There is also the necessity of getting equipment (tractors, trailers, etc.) in and out to perform work as needed.

1

Comment Letter 2 Wyatt McCrea

Response 2.1

There will be temporary access disruptions during the Project's construction period; however, access to your place of residence and other areas of your property will be ensured. The DEIR states that use of the project area for construction would be required for up to seven months; the DEIR also evaluates access to the project area during this time. As described in Section 5.17 Transportation and Traffic, and Section 5.15 Public Services, access impacts would be less than significant. Implementation of MM TRAN-2: Emergency Vehicle Access Plan, would further reduce access impacts. No other projects were identified that would impact access and transportation and therefore, cumulative impacts are less than significant (Section 6.3.14). As described in Section 5.14.3.2, no homes or people would be displaced as a result of construction of the Project. Therefore, no impacts to population and housing would occur as a result of construction, and no cumulative impacts would occur (Section 6.3.13). United will continue to coordinate with you and other potentially affected landowners to further minimize potential impacts associated with access during construction.

In addition, there is the question of access for the utility companies - meter readers, maintenance crews for electric and phone service, both as scheduled and in emergency situations. And, most importantly, of fire, police and EMT emergency vehicle access since this is a place of residence. The east road, our easement, is the only all-weather road in or out.

2

Lack of access also jeopardizes our potential for rental income and future agricultural endeavors we are considering such as planting avocados over the next few years. On top of that, the market value of our property becomes virtually entirely diminished until the project is completed.

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In reviewing the Draft EIR it appears that there are going to be alternate and temporary access roads installed on the east side of the dam. We are hopeful that, at the very least, these access roads may present a possible option for our use as needed during the tenure of the project.

5

There has been casual mention by two different staff members of potential monetary compensation for any hardship or inconvenience that may arise. While we understand there may be disruptions, it is our desire to be able to maintain as much uninterrupted daily access to our home as possible and that the District would implement a plan for their work in accordance therewith.

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We have always enjoyed a very positive and cooperative relationship with United Water during the years we have owned our property. While we certainly understand the importance of the proposed project and the reasons it needs to be done, my wife and I hope that you also understand the importance of us being able to maintain our home and our lives.

We look forward to further discussions regarding potential solutions to the issues at hand. I can be reached by email at - [REDACTED]; or cell [REDACTED].

Respectfully submitted,

Wyatt McCrea

Encl.; April 2017 letter
cc. Charles Cohen: Cohen, Begun & Deck, LLP

Response 2.2

As described in Section 5.17.3.2, UWCD would implement an emergency vehicle access plan (MM TRAN-2: Emergency Vehicle Access Plan) to ensure that first responders can safely enter and pass through the site in the event of an emergency. Therefore, impacts associated with emergency access would be less than significant and further reduced by mitigation. The following sentence has been added to the section: "In addition to emergency vehicle access, the project would result in a less than significant impact with regard to general access, including by utility company vehicles."

Response 2.3

Please see Comment Response 2.1. As noted in Section 5.3.3.1, there would be no impacts to agriculture as a result of the Project.

CEQA does not require an evaluation of economic impacts or evaluation of impacts on uses that aren't present at the time of project analysis because doing so would be speculative.

Response 2.4

Please see Comment Response 2.1.

Response 2.5

Please see Comment Response 2.1.

Response 2.6

Please see Comment Response 2.1.

Response 2.7

Comment noted. United will continue to coordinate with you and other potentially affected landowners, and any significant impacts would be reduced to less than significant by the mitigation measures provided.

3

DEAN DUNN-RANKIN
SANDRA A. CALLE
WILLIAM E. HALLE
ANDREW K. HARTZELL
JOHN D. HUDSON
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OF COUNSEL
WILLIAM L. TWOMEY
DENNIS D. O'NEIL
(938-2017)

December 20, 2018

VIA E-MAIL (maryamb@unitedwater.org) AND U.S. MAIL
United Water Conservation District
Attention: Maryam Bral, PE
106 N. 8th Street
Santa Paula, CA 93060

Re: Comments on Santa Felicia Dam Safety Improvement Project Draft Environmental Impact Report

Dear Ms. Bral:

Our firm represents Rancho Temescal ("RT" or the "Ranch"). On behalf of our client, we are pleased to provide the following comments on the above-referenced draft Environmental Impact Report ("EIR") for the Santa Felicia Dam safety improvement project ("Project" or "proposed Project").

Rancho Temescal is located immediately adjacent to the United Water Conservation District ("UW") Santa Felicia Dam property. Rancho Temescal and its operations border UW's property immediately south, east and west of the lower reach of Lake Piru and of the primary activities being proposed and analyzed in this EIR. Rancho Temescal has worked hard over the years to maintain a strong, cooperative relationship with UW and to be a good neighbor, and RT values and appreciates UW's general intentions to operate as a good neighbor as well. As it has stated previously, RT is generally supportive of the overall safety objectives which UW desires to achieve through implementation of the Project. Nevertheless, given the nature of the activities associated with the proposed Project and the length of time of anticipated construction and effects on RT – a four to five year construction process with both component phases anticipated to be at least 24 months or longer – it is imperative that UW work diligently and thoughtfully with RT to minimize adverse Project impacts on Rancho Temescal and its operations.

As you may know, Rancho Temescal and this firm provided comments on the Notice of Preparation of the draft EIR ("dEIR") by letter dated May 1, 2017. A copy of that letter is attached, for your convenience (the "NOP Letter"). Although the dEIR addressed some of the comments and issues raised in the NOP Letter, others were not addressed or analyzed. RT requests that all of the issues and comments raised in the NOP Letter be addressed by UW in writing, made

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**Comment Letter 3 Andrew Hartzell
O'Neil LLP on behalf of Rancho Temescal**

Response 3.1

UWCD has evaluated and responded to public comment in accordance with CEQA Guidelines Section 15088. The EIR addresses the comments provided during scoping. Section 1.5 has been expanded to provide further detail regarding topics raised during scoping and where they are addressed in the document. Alternatives proposed during scoping, including an eradication program for quagga mussels and providing a penstock connection to Rancho Temescal for existing riparian water rights, that do not meet the proposed Project objectives nor are related to the Project were not carried forward for analysis in the EIR.

1

United Water Conservation District
December 20, 2018
Page 2

publicly available, and be directly provided to RT prior to finalizing the EIR, and to do so with enough advance time to enable RT to review those comments and respond thereto in advance of any action by UW to certify the EIR or approve the Project. Those comments made and issues raised in the NOP Letter should be considered incorporated by reference into this comment letter (as many of them will not be repeated in this letter).

Rancho Temescal also requests that UW schedule a meeting with it in early January to discuss how UW intends to address and respond to certain of the issues raised in this letter pertaining to potentially significant impacts to the health and safety of Rancho Temescal guests, visitors, lessees, employees and their families, and disruptions to important operations of – and on – Rancho Temescal, such as its horse boarding, cattle grazing, equestrian services, filming, and agricultural operations.

RT offers the following additional comments and requests regarding the dEIR and the Proposed Project.

Noise Impacts Related to Project Need to be Further Mitigated

The dEIR finds that noise impacts to persons living and working on the Ranch and the surrounding environment will remain significant even after the implementation of identified mitigation measures. RT believes that other feasible mitigation measures are available to further reduce significant impacts from noise, and that UW must employ those mitigation measures to lessen noise impacts to at least two classes of receptors, namely: (1) persons living in residential structures on Rancho Temescal, and (2) horses and persons located at horse facilities and usage areas on Rancho Temescal, including, but not limited to, the Equestrian Center.

There are at least two types of anticipated noise impacts from the Project which are of particular concern: (1) increased noise levels from Project construction at employee residences within RT, and (2) sudden, loud (albeit brief) noises from Project construction operations which are likely to startle horses and thereby adversely impact both horses (including, but not limited to, increased stress levels and increased chances of physical injury) and endanger people in close proximity to those startled horses (such as handlers, nearby employees, and individuals visiting the Ranch). Not only is the latter a public safety issue (potential human injury from startled horses), but those noise impacts would also be expected to cause a negative impact on biological resources (horses breeding and boarding at the Ranch) and cause an indirect adverse impact on land use and RT's business operations. The dEIR appears to have provided no analysis of the Project's potential adverse effects on the horse population located on Rancho Temescal.

The dEIR notes that construction operations may continue into the evening and even, in some cases, into the night. This possibility, as well as the noise levels possible, can be expected to have a significant negative impact on the five or more residential dwellings on RT (and the families who live there). The dEIR itself acknowledges significant impacts on dwellings on the RT property, but concludes that mitigation measures do not exist capable of reducing the impacts to below a level of significance, including activities during evening and nighttime hours. We believe UW has not examined the issue of potential noise mitigation measures sufficiently, and that feasible mitigation measures must be available to reduce all noise impacts to below a level of significance. UW should examine, for example, whether erecting strategically located temporary sound walls (or other acoustic barriers) to reduce noise levels on the residences on RT could reduce the adverse effects of

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Response 3.2

Comment Noted. United has met with Rancho Temescal during the preparation of this EIR and remains committed to open communication to minimize impacts to Rancho Temescal property and operations. The EIR evaluates all resource areas required in CEQA Appendix G Checklist, and finds that all are less than significant or significant but mitigable with the exception of short-term noise impacts (discussed in Section 5.13) and recreation impacts (Section 5.16). Potential impacts associated with the health and safety of Rancho Temescal guests, visitors, lessees, employees and their families would be less than significant due to the implementation of mitigation measures identified in the EIR, including the following: MM AQ-1: Implement ROC and NOx construction mitigation measures; MM AQ-2: Prepare and implement a fugitive dust control plan; MM HZ-3: Develop fire control and emergency response plan; MM NOISE-1: Noise reduction and control practices; MM TRAN-1: Temporary Signage; MM TRAN-2: Emergency vehicle access plan; and MM TRAN-3: Fire Control and Emergency Response Plan.

The commenter also notes concerns regarding impacts to horse boarding, cattle grazing, equestrian services, filming, and agricultural operations. The CEQA environmental issue areas that may affect these land uses include Air Quality, Hazards and Hazardous Materials, Noise, and Transportation and Traffic. As described above, the implementation of mitigation measures for these environmental issue areas would ensure that potential impacts are less than significant for all resources with the exception of noise. United will continue to work with potentially affected landowners to minimize potential impacts.

Response 3.3

Section 5.13.1.5 identifies the Rancho Temescal Equestrian Center and residences as sensitive receptors. Tables 5.13-15 through 5.13-16 and text on p. 5.13-34 and 5.13-35 describe potential significant noise impacts at Rancho Temescal. The DEIR evaluated feasible mitigation measures for noise-related impacts. MM NOISE-1: Noise Reduction and Control Practices, lists numerous mitigation measures that would be implemented to reduce noise impacts of the Project as much as possible. However, even with implementation of noise reduction measures detailed in MM NOISE-1, there is a potential for

United Water Conservation District
December 20, 2018
Page 3

noise on those residents. The dEIR should also examine mitigation measures precluding evening and nighttime construction operations which could negatively impact the health and sleep of persons living nearby.

The dEIR does not seem to appreciate that many of the horses which board at and use the Rancho Temescal facilities are highly prized and valued. They represent both a valuable biological and economic resource. Moreover, the dEIR measures the Project's noise impacts only considering the range of sound frequencies detected by the human ear. Horses hear higher frequencies than humans do and can hear sounds at greater distances, so any consideration of Project noise impacts should also study and analyze the Project's expected contribution to those higher frequencies and the impact the Project's increased noise levels at those frequencies can have on horses located at the Ranch given their auditory capabilities. As a point of reference, enclosed please find information on the impact of noise on horses from The British Horse Society. Noise impacts on horses can be found at its website: www.bhs.org.uk. As that article notes: "Hearing ability is very important to survival for a horse and its ears can pick up sound at a lower volume and a greater distance than will be detected by a human." The article also notes that the instinct of a horse is to "assume that unexpected noises are a predator and a threat, so they will flee first and check later. . . . While in flight mode, a horse is difficult to control and could run into a dangerous situation which it would normally avoid (such as traffic)."

Sudden noises commonly spook horses. The Project can be expected to cause such sudden noises with the potential to startle horses on RT as a result of various Project activities, including: increased traffic and large equipment traffic passing by horse facilities on RT, blasting activities, drilling activities, use of explosives, jackhammers, cement blasters, and other construction noise creating sudden, punctuated and loud noise. A number of people work daily with the horses at Rancho Temescal, and such expected increased frequencies of startled horses as a result of Project construction noise and Project traffic noise, pose a public safety danger to persons on the Ranch. As mentioned above, horses can generally pick up sounds at greater distances. So the higher frequencies detected and greater hearing ranges (compared with humans) mean that the standards used in the dEIR to identify the significance thresholds are not appropriate for evaluating the Project's noise impacts on horses (and humans affected by those equestrian sensitivities). Accordingly, the dEIR needs to also conduct a noise study with thresholds of significance calibrated for frequencies, distances and volumes potentially adverse to horses.

Again, RT requests that UW adopt additional mitigation measures to reduce the impacts of Project noise. Additional mitigation measures are feasible and should include strategically placed, temporary sound walls (or acoustic barriers) buffering parts of the roadway through RT and parts of RT facilities where horses are located. Since the dEIR also notes that construction may occur in the evening and nighttime hours, mitigation measures should also include the addition of sound walls near horse stable facilities to reduce adverse impacts from evening and night construction activities.

Adverse Impacts on Public Safety Remain

As mentioned in the NOP Letter, the proposed Project appears to be proposing to route a substantial amount of Project construction traffic, including large vehicles, through the Ranch on a road not accustomed to such large equipment and frequent use. The anticipated substantial increase in traffic on roadways through the Ranch, including frequent trips by large

184940 v1 3098.1

Ventura County noise thresholds to be temporarily exceeded at sensitive receptors.

Response 3.4

The DEIR addresses all environmental issue areas identified in the CEQA Appendix G Checklist. Section 5.13.1.5 identifies the Rancho Temescal Equestrian Center and residences as sensitive receptors. Captive horses are not considered a biological resource and therefore not included in Section 5.5 Biological Resources. Tables 5.13-15 through 5.13-16 and associated text describe potential significant noise impacts at Rancho Temescal. The DEIR evaluated mitigation measures for noise-related impacts to sensitive receptors, such as human or equine receptors. MM NOISE-1: Noise Reduction and Control Practices, lists numerous mitigation measures what would be implemented to reduce noise impacts of the Project as much as possible. However, even with implementation of noise reduction measures detailed in MM NOISE-1, there is a potential for Ventura County noise thresholds to be exceeded at sensitive receptors.

Response 3.5

MM NOISE-1: Noise Reduction and Control Practices, states that noise-attenuating barriers and/or blankets would be used to reduce noise levels where feasible and that nighttime construction would be avoided as possible. However, even with implementation of noise reduction measures detailed in MM NOISE-1, there is a potential for Ventura County noise thresholds to be exceeded at sensitive receptors.

Response 3.6

The DEIR addresses all environmental issue areas identified in the CEQA Appendix G Checklist. Section 5.13.1.5 identifies the Rancho Temescal Equestrian Center and residences as sensitive receptors. Captive horses are not considered a biological resource and therefore not included in Section 5.5 Biological Resources. There are no regulatory noise thresholds for horses, and the analysis that evaluated human impacts led to the need to provide noise-related mitigation, as described in MM-NOISE 1: Noise Reduction and Control Practices. The DEIR found that, even with all feasible mitigation, noise impacts could remain significant. Therefore, it is not appropriate to a conduct a separate equine-specific noise study. DEIR Impact NOISE-3 acknowledges that the Project would cause significant and

United Water Conservation District
December 20, 2018
Page 4

construction-related vehicles, presents a public safety challenge. UW should adopt meaningful mitigation measures on vehicle drivers and their routes through the Ranch to better ensure that those construction vehicles do not injure Ranch employees, lessees, agricultural operators/farm workers, film crews, visitors, guests, horses and livestock. Currently, the dEIR lacks mitigation measures to address public safety issues on roadway segments through Rancho Temescal which UW intends its construction vehicles and equipment to use. Lower speed limits for such vehicles through the Ranch and limiting the hours of the day when the larger construction vehicles may traverse roadways on the Ranch (to avoid those times of greatest activity on and near the roadways by other people, Ranch personnel and Ranch operations) are two measures which should help reduce the adverse impacts on public safety.

As mentioned above, the anticipated sudden, loud, brief noises from Project construction (and sudden noises from large vehicles associated with construction traffic) have the potential to startle horses located on the Ranch, including during times when those horses are in close proximity to humans working with those animals. Those sudden noises have the potential to elicit an unexpected and harmful reaction from horses, which could lead to significant and direct physical injuries to humans working with those animals (as well as to the animals themselves). The EIR needs to incorporate additional and effective mitigation measures to address those potential and significant impacts.

Adverse Impacts to Land Use – The Loss of Access to Rancho Temescal Grazing Land East of Lake Piru During Project Construction Has Not Been Addressed or Mitigated

As mentioned in the NOP Letter, RT and its lessees use RT property located east of Lake Piru for cattle grazing. This Ranch property is important for RT's agricultural operations, its sustainable land-use practices, and the Ranch's economic well-being. RT and its lessees require both pedestrian and vehicular access to these lands east of the Lake, and they need cattle to be able to access those lands as well (both continued ingress and egress).

Furthermore, UW is legally obligated to provide continued access to those lands east of Lake Piru. If access to its lands east of Lake Piru will be limited (or denied) as a result of the Project, UW would have obligations to reimburse RT for the financial losses associated with such access restrictions. This issue should be discussed with Rancho Temescal in January 2019.

The dEIR did not address how this important access is going to be maintained or provided via a feasible, alternative access route by UW during the Project's four to five year construction period. Nor did the dEIR address the potential for significant, negative land use impacts resulting from a lengthy Project construction period which may preclude access to these important grazing lands during some – or all – of this time. UW should address this issue in the EIR and when it meets with Rancho Temescal in early January to discuss the Project proposed in the EIR.

We also note that the dEIR did not address the issue (discussed in the NOP Letter) of the potential for increases in soil erosion from the Project as a result of the Project's potential (during the construction period) to interfere for two to five years or more with RT's grazing rotation pattern on the Ranch.

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unavoidable temporary or periodic increases in ambient noise levels in the Project vicinity above levels existing without the Project.

Response 3.7

Comment Noted. The access road has been and continues to be used as the principal access route for dam-related maintenance and construction; the proposed Project is not a new impact in this regard. With respect to traffic, MM AQ-2: Prepare and implement a fugitive dust control plan, limits vehicle traffic to 15 mph. The following text has been added to Sections 3.1.5 and 3.2.2, describing the construction activity: "Large-sized truck trips would be scheduled during off peak hours as feasible." Potential impacts to emergency access are discussed in Impact TRAN-2 and Impact PUB-1, both of which are less than significant impacts. MM TRAN-2: Emergency Vehicle Access Plan, is provided to further reduce emergency access impacts.

As described in Section 5.15 Public Services and 5.17 Transportation and Traffic, potential impacts of the Project to transportation, traffic, and access are less than significant.

United has met with Rancho Temescal during the preparation of this EIR and remains committed to open communication to minimize impacts to Rancho Temescal property and operations.

Response 3.8

Section 5.13.1.5 identifies the Rancho Temescal Equestrian Center and residences as sensitive receptors. The DEIR evaluated feasible mitigation measures for noise-related impacts to sensitive receptors, such as human or equine receptors. MM NOISE-1: Noise Reduction and Control Practices lists numerous mitigation measures that would be implemented to reduce noise impacts of the Project as much as possible. However, even with implementation of noise reduction measures detailed in MM NOISE-1, there is a potential for Ventura County noise thresholds to be exceeded at sensitive receptors, including Rancho Temescal Equestrian Center and residences.

Response 3.9

Comment Noted. The EIR addresses the comments provided during scoping. Section 1.5 has been expanded to provide further detail regarding topics raised during scoping and where they are addressed in the document. UWCD understands that cattle grazing and

United Water Conservation District
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Page 5

Fugitive Dust Control - Impacts to Rancho Temescal Crops and Grazing Lands

RT appreciates that UW has recognized in the dEIR the potential for the Project to cause significant impacts from fugitive dust. The EIR needs to recognize that fugitive dust from the Project (construction) has the potential to damage agricultural lands on RT (including crops and livestock grazing areas) and cause problems for agricultural workers, lessees, employees and persons working on Rancho Temescal property. UW should then re-analyze its currently proposed mitigation measures to ensure that Project construction operations are incorporating mitigation measures adequate to prevent fugitive dust from settling on crops, grazing lands and other agricultural lands on RT.

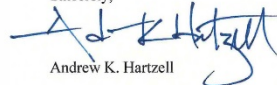
The dEIR does not seem to have incorporated adequate mitigation measures to minimize the creation of fugitive dust from the use of the roadway through Rancho Temescal over which UW proposes to route many of the construction vehicles for the Project (including very large construction vehicles). See, for example, page 5.17-2 of the dEIR. This oversight needs to be corrected in the EIR, and proper and effective mitigation measures adopted to prevent travel on this roadway from producing fugitive dust which would be harmful to persons on the Ranch, to horses and livestock, and to agricultural crops, grazing lands, and filming activities.

As the lead agency, UW needs to commit, through the adoption and implementation of effective mitigation measures in the EIR, to controlling fugitive dust emissions from Project construction to ensure that such adverse impacts to persons, crops, grazing lands and animals on the Ranch property do not occur. It will be important for UW to carefully adhere to those measures to limit and control fugitive dust emissions.

Conclusion

We appreciate the opportunity to comment on the draft EIR. Questions regarding this letter and further coordination on those issues may be directed to the undersigned or Mr. Tim Cohen at Rancho Temescal. Please include both the undersigned and Mr. Tim Cohen on your mailing lists of interested parties requesting notifications of any announcements of developments associated with this proposed project.

Sincerely,



Andrew K. Hartzell

Enclosures: Letter from O'Neil LLP to United Water Conservation District, May 1, 2017
(on NOP for Project)

"The Impact of Noise on Horses," The British Horse Society

cc: Tim Cohen

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agricultural activities are important aspects of Rancho Temescal's operations. The following sentence has been added to Section 5.3.3.1: "The Project would not alter or impede existing agricultural operations, including grazing." Pedestrian and vehicular access to lands east of the Lake will be maintained throughout the Project construction period, with intermittent interruptions due construction vehicles and equipment. UWCD will continue to coordinate with Rancho Temescal during Project construction and notify Rancho Temescal in anticipation of any potential access restrictions during construction. Potential impacts associated with Rancho Temescal's access to property in the Project area would be less than significant, per CEQA thresholds.

Transportation and Traffic impacts are discussed in Section 5.17.3 and are less than significant and potential agricultural impacts are discussed in Section 5.3.3; there would be no impacts to agricultural and grazing. United has met with Rancho Temescal during the preparation of this EIR and remains committed to open communication to minimize impacts to Rancho Temescal property and operations.

Response 3.10

The EIR addresses the comments provided during scoping. Section 1.5 has been expanded to provide further detail regarding topics raised during scoping and where they are addressed in the document. The DEIR addressed potential impacts from erosion during construction in Section 5.7.3.2 (Impact GEO-2) and Section 5.10.3.2 (Impact HWQ-2). As described in these two sections, potential impacts from erosion during construction are less than significant. The following sentence has been added for clarification purposes to Section 5.3.3.1: "The Project would not alter or impede existing agricultural operations, including grazing."

The commenter does not provide evidence that the Project would cause erosion that could impede grazing for 2-5 years at the Ranch and therefore a more specific response is not possible.

Response 3.11

As described in Section 5.4.3.2, Impact AQ-2, the Project has the potential to generate fugitive emissions at a significant level (p.5.4-14-15). However, MM AQ-2: Prepare and implement a fugitive dust control plan, describes the measures that UWCD would implement in

The Impact of Noise on Horses

The
British
Horse
Society

A horse's range of hearing is greater than a human to higher frequencies (over 33KHz in the horse compared with under 20KHz in humans) although a horse may not be able to hear the lowest frequencies audible to humans¹. Hearing ability is very important to survival for a horse and its ears can pick up sound at a lower volume and a greater distance than will be detected by a human. As with humans, there is variation in quality of detecting sound at the extremes of the range with some horses hearing much better than others. Age may decrease aural function, as may certain health conditions.

Horses are prey animals and their usual response to danger is flight. Their instincts will assume that unexpected noises are a predator and a threat so they will flee first and check later. A horse will hear a sound, quite possibly not detected by a human near it, may freeze (to remove its own noise), then spin and run away from the noise. Depending on temperament and the perceived threat level, the horse may stop and turn back to the source of the noise to check whether further action is needed, or may carry on running. A horse may also spin to identify the direction of the threat and a horse submitting to control of the rider not to bolt may plunge or spin around in a small area while trying to see the threat.

There is a danger to a handler or rider who may be knocked over or thrown during the spin or bolt, and even if staying with the horse, may not be able to stop before losing contact or encountering another hazard. While in flight mode, a horse is difficult to control and could run into a dangerous situation which it would normally avoid (such as traffic).

Horses can become difficult to handle in conditions where there is a continuous level of noise because it may mask other sounds that could be a threat. This may be a reason for unsettled behaviour in wind or by the sea or heavy traffic, especially in an unusual environment where the horse is not comfortable with the general threat level.

Variation in their temperament, the nature of the environments they have known and their confidence will affect how horses respond to a noise. Generally, sudden noises are likely to trigger flight responses with the severity of reaction increasing with proximity of the noise. The abrupt reaction could be dangerous to a rider, carriage-driver or handler, and potentially to others in the vicinity if the horse cannot quickly be controlled.

Horses become accustomed to noise, whether short sharp sounds, continuous noise or discontinuous noise (e.g. gunshot, motorway, railway train). Police and military horses have proven their resilience to noise but the training involved is highly skilled and the horses are very carefully selected. Such training

¹Saslow, C. A. (2002) Understanding the perceptual world of horses. *Applied Animal Behaviour Science*, 78: 209-224.

order to comply with VCAPCD Rule 55 - Fugitive Dust and to minimize the impacts of fugitive dust to a less than significant level.

As provided in Comment 5.1, the Ventura County Air Pollution Control District concurs that air quality impacts from the project would be less than significant.

Response 3.12

Fugitive dust is discussed in Section 5.4 Air Quality, not 5.17 Transportation and Traffic. As described in Section 5.4.3.2, Impact AQ-2, the Project has the potential to generate fugitive emissions at a significant level. However, MM AQ-2: Prepare and implement a fugitive dust control plan, describes the measures that UWCD would implement in order to comply with VCAPCD Rule 55 - Fugitive Dust and to minimize the impacts of fugitive dust to a less than significant level.

The British Horse Society

is beyond the scope of most horse owners therefore it should be assumed that noise is likely to be distressing to horses which are not accustomed to it. If a human may be disturbed by a noise, then so may a horse be disturbed, but a horse will be concerned about many sounds which humans are able to recognise and dismiss instantly.

Temperament and experience will affect whether individual horses can become habituated to noise or whether their distress level continues or rises. It cannot be assumed that a noise that is accepted by one horse will be accepted by all.

Environments which are likely to produce noise should be avoided in the vicinity of routes used by riders and carriage-drivers, particularly off-road byways, bridleways and minor roads which should be protected for quiet recreation and exercise. Sudden loud noises should particularly be avoided, e.g. bird-scarer gas-guns.

The impact of noise on horses can be reduced by acoustic barriers; by vegetation or buildings. Where noise near horses is unavoidable, mitigation through the range of sound for horses should be considered through use of acoustic barriers where possible.

Considering how similar a noise may be to a natural predator is a useful guide to whether a horse will be troubled by it. A quiet rustling is likely to have greater impact than a high speed train because the former could easily be associated with a predatory animal moving into position to attack whereas a train is a continuous steady loud noise that can be heard from far away and the majority of horses these days have been exposed to and accepted commonly occurring mechanical noises from their birth. There are many situations of horses unperturbed by trains or motor traffic, even for the first time, in fields or on bridleways alongside a railway or motorway. Because a human hears a sound, it is often assumed that this is what is troubling a horse, but the horse may have heard that sound long before and already dismissed it as not a threat, but could be reacting to a movement that a human has not seen, possibly even behind it.

IMPORTANT This guidance is general and may not apply in all circumstances. The Society recommends seeking advice specific to a site where appropriate.

Version: 270318

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— Noise —



December 19, 2018

United Water Conservation District
Maryam Bral, PE
106 N. 8th Street
Santa Paula, Ca 93060

SUBJECT: DRAFT ENVIRONMENTAL IMPACT REPORT

Project Title: Santa Felicia Dam Safety Improvement Project
Project Address: Santa Felicia Dam, Piru, CA 93040
Property Owner: United Water Conservation District
APN: 016-0-210-03

JEFF PRATT
Agency Director
Central Services Department
J. Tabin Coello, Director
Engineering Services Department
Christopher Cooper, Director
Transportation Department
David Fielesch, Director
Water & Sanitation Department
Michaela Brown, Director
Watershed Protection District
Glenn Shaphard, Director

Dear Ms. Bral:

Public Works Agency Transportation Department (PWATD) has reviewed the draft EIR for the project described below. The following mitigation measures must be included in the Final EIR to mitigate the project specific impacts and cumulative impacts to county roadways.

Project Description:

United Water Conservation District (UWCD) has a Santa Felicia Dam Safety Improvement Project that will be implementing improvements on two different components of the Santa Felicia Dam. One component will be to improve the outlet works system which estimated will take up to 36 months to complete, depending on which alternative is chosen, and will generate 154 ADT during the first component scope of work. The second component will be to either widen or deepen the spillway, which will take place after the outlet system improvements. To either widen or deepen the spillway it will take up to 24 months and will generate up to 244 ADT. Piru Canyon Road currently has an ADT of 500 and Main Street has an ADT of 4200.

PUBLIC FACILITIES/SERVICES

Transportation/Circulation

1. TRAFFIC IMPACT MITIGATION FEE:

Purpose: To address the cumulative adverse impacts of traffic on the Regional Road Network, Ventura County General Plan Goals, Policies, and Programs Section 4.2.2-6

**Comment Letter 4 Anitha Balan
Ventura County Public Works Transportation Department**

Response 4.1

Thank you for the information. Upon final design completion, UWCD will coordinate with VCPWATD regarding the applicability of fee requirements.

Maryam Bral
December 19, 2018
Page 2 of 5

and Ventura County Ordinance Code, Division 8, Chapter 6 require that the PWATD collect a Traffic Impact Mitigation Fee (TIMF).

Requirement: The applicant/permittee shall deposit a TIMF with the PWATD. The trip generation rate and TIMF will be calculated based on the applicant's information. The applicant/permittee may choose to submit additional information to supplement the information currently provided to establish the trip generation rate. The TIMF may be adjusted for inflation at the time of deposit in accordance with the latest version of the Engineering News Record Construction Cost Index.

Based on the applicant's information:

The weighted average ADT is 190 ADT (154 ADT for 3 years and 244 ADT for the following 2 years).

- a. The TIMF due to the County is:

$$190 \text{ ADT} \times \$21.01^{(1)} \text{ per ADT} = \underline{\$3,991.90}$$

- b. The TIMF due to the County for the Piru Augmentation Fee:

$$190 \text{ ADT} \times \$99.66^{(2)} \text{ per ADT} = \underline{\$18,935.40}$$

Notes:

- (1) County of Ventura TIMF fee for Case by Case in the Piru Area District #14.
(2) County of Ventura Piru Augmentation TIMF fee for Case by Case in the Piru Area District #14. (Ord. No. 4500, 12-13-2016)

Documentation: The applicant/permittee shall come to the PWA Transportation Department counter, fill out the TIMF form, and pay the TIMF. The applicant/permittee shall provide a copy of the Conditions of Approval for the project. The fee will not be collected without sufficient documentation.

Timing: This condition shall be met prior to start of construction or prior to the approval of a grading permit for the project.

2. ROAD IMPROVEMENTS:

Purpose: Road improvements shall be required when a construction project has the ability to deteriorate the pavement condition of a roadway due to increased wear and tear from the additional trips generated from this project.

Response 4.2

Thank you for the information. Upon final design completion, UWCD will coordinate with VCPWATD regarding the applicability of fee requirements.

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Maryam Bral
December 19, 2018
Page 3 of 5

Requirement: To mitigate the impacts to Piru Canyon Road and Main Street, UWCD will be required to pay to PWATD, a pro rata share of the road improvements needed for the increased deterioration of the pavement.

- a. The current ADT on Piru Canyon Road and Main Street are 500 ADT and 4200 ADT respectively. The total trip generation from this project over 5 years is 950 ADT. Main Street and Piru Canyon Road was last resurfaced in 2011.

For calculation of the pro rata share, PWATD assumed a 25-year life span for the pavement on both roads. The total ADT on Piru Canyon Road and Main Street for a 25-year period is 12,500 ADT and 105,000 ADT respectively. The pro rata share of ADT, on Piru Canyon equates to 7.6% of the total trips and on Main Street equates to 0.905% of the total trips. The trips generated from the construction project will be traveling one mile on Main Street and 4.92 miles on Piru Canyon Road. The estimated construction cost for to repave these roadways is approximately \$1.714 Million. Therefore, the pro rata share required to be paid by UWCD is \$110,880.17.

- $\$1,714,000 / 5.92 \text{ miles} = \$289,527.03 \text{ per mile}$

Pro rata share for Piru Canyon Road:

- $\$289,527.03 * 7.6\% * 4.92 \text{ miles} = \$108,259.95$

Pro rata share for Main Street:

- $\$289,527.03 * 0.905\% * 1 \text{ mile} = \$2,620.22$

Total pro rata share

- $\$108,259.95 + \$2,620.22 = \underline{\$110,880.17}$

Documentation: UWCD shall include these requirements as project conditions to mitigate the impacts of the project.

Timing: This condition shall be met prior to start of construction or prior to the approval of a grading permit for the project.

3. TURN-OUT POCKET:

Purpose: Turn-out pockets are required when heavy truck traffic is expected to travel a significant distance that might impede the standard rate of flow of traffic or prevent access

Response 4.3

The DEIR finds that potential impacts from the Project on Transportation and Traffic would be less than significant (Section 5.17). However, it provides mitigation measures to further reduce potential impacts. The following text has been added to MM TRAN-2: Emergency Vehicle Access Plan, in response to the comment: "If the alternate transportation routes utilized in the final design are unable to accommodate increased traffic flow and emergency access would be impeded, UWCD shall construct a paved turn-out pocket midway between Center Street and construction site location, northbound on Piru Canyon Road."

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Maryam Bral
December 19, 2018
Page 4 of 5

for emergency vehicles for a significant amount of time out of the day, over a long period of time. The impact of slow moving truck traffic generated from this project on Piru Canyon Road must be mitigated.

Requirement: Page 5.17-6 of the Draft EIR talks about the construction of turn pockets to mitigation measures of truck traffic hindering emergency vehicles to pass, this is also a concern that truck traffic will significantly slow the normal flow of traffic on Piru Canyon Road. PWATD requires UWCD to construct a paved turn-out pocket midway between Center Street and construction site location, northbound on Piru Canyon Road. Submit plans prepared and stamped by a license Civil Engineering in the State of California showing the location of the improvements and specifications of the improvements.

Documentation: UWCD shall include these requirements as project conditions to mitigate the impacts of the project.

Timing: This condition shall be met prior to start of construction or prior to the approval of a grading permit for the project.

4. TEMPORARY SIGNAGE:

Purpose: To reduce any potential safety hazard and to promote more awareness to motorist and residence and as states on page 5.17-6 of the Draft EIR.

Requirement: Install temporary signage, mitigation measure MM TRAN-1, on Piru Canyon Road and Main Street to the north and to the south of the project access points and periodically at least every 2 miles in both directions over the entire duration of the project, advising motorist of the presence of construction trucks on the roadway.

Documentation: UWCD shall submit a site map showing the location of the signage and other traffic control measured that will be installed.

Timing: This condition shall be met prior to start of construction.

5. ENCROACHMENT PERMIT:

Purpose: An Encroachment Permit is required for all signs posted and any work conducted within the County right-of-way.

Requirement: An Encroachment Permit is required for all signs posted and any work conducted within the County right-of-way. The applicant/permittee shall contact the Permits Section at (805) 654-2055 for requirements of the permit. The application shall be submitted to the PWA – Transportation Department.

Response 4.4

Requested text has been added to MM TRAN-1: Temporary Signage, so the measure now states: "In order to further reduce any potential safety hazards, UWCD shall install temporary signage on Piru Canyon Road to the north and to the south of the Project access points and periodically at least every two miles in both directions over the duration of construction, advising motorists of the presence of construction trucks on this roadway."

Response 4.5

The following text has been added to Section 5.17.2.3.2 "Encroachment Permit: The Ventura County Public Works Agency requires an Encroachment Permit for all signs posted and any work conducted within the County right-of-way."

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Maryam Bral
December 19, 2018
Page 5 of 5

Documentation: The application shall be submitted to the PWA – Transportation Department. When applying for the permit, the applicant/permittee shall provide sufficient documentation, including, but not limited to, a (1) Project title and location, (2) a copy of the Conditions of Approval in the EIR, (3) a sketch or map showing the work to be accomplished, project, project parcel, Assessor Parcel Number (APN), address and street name. Permit applications without sufficient documentation for processing may not be accepted for processing.

Timing: This condition shall be met prior to start of construction or prior to the approval of a grading permit for the project.

If you have any questions regarding the review, please contact Darren Arrieta at [REDACTED] or at [REDACTED]

Sincerely,



Anitha Balan
Engineering Manager

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Ventura County
Air Pollution
Control District

649 County Square Dr.
Ventura, California 93003

tel 805/645-1400
fax 805/645-1444
www.vcapcd.org

Michael Villegas
Air Pollution Control Officer

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**VENTURA COUNTY
AIR POLLUTION CONTROL DISTRICT**
Memorandum

TO: Maryam Bral, United Water Conservation District
DATE: December 07, 2018
FROM: Nicole Collazo, Planning Division
SUBJECT: Request for Review of Draft Environmental Impact Report (DEIR) for the Santa Felicia Dam Safety Improvement Project (RMA #17-010-1)

Air Pollution Control District staff has reviewed the DEIR for the project number referenced above. The proposed project would consist of a four-year construction to 1) replace the existing outlet works system, including installation of a new hydroelectric turbine, and 2) widen or deepen the existing spillway in order to meet current regulatory inflow design flood capacity. The Lead Agency for the project is the United Water Conservation District.

General Comments

As a commenting agency, District staff concur with the findings that operational air quality impacts from the project would be less than significant based on the established air significance thresholds and the nature of operational emissions being temporary and short-term (Page 5.4-16). Due to the amount of construction and grading (4 years total) and that compliance with APCD-related conditions are complaint-based, we recommend the following addition to the DEIR, MM AQ-2 on Page 5.4-15:

9. Signs displaying the APCD Complaint Line Telephone Number (805) 654-2797 for public complaints shall be posted in a prominent location onsite but clearly visible to the public off the site.

Thank you for the opportunity to review the Draft EIR for proposed project.

If you have any questions, please contact me directly at [redacted] or [redacted].

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**Comment Letter 5Nicole Collazo
Ventura County Air Pollution Control District**

Response 5.1

Comment noted.

Response 5.2

The requested text (9. Signs displaying the APCD Complaint Line Telephone Number (805) 654-2797 for public complaints shall be posted in a prominent location onsite but clearly visible to the public off the site.) has been included in MM AQ-2: Prepare and implement a fugitive dust control plan.



State of California – Natural Resources Agency
CDFW OF FISH AND WILDLIFE
South Coast Region
3883 Ruffin Road
San Diego, CA 92123
(858) 467-4201
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director



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December 19, 2018

Ms. Maryam Bral, P.E.
United Water Conservation District
106 N. 8th Street
Santa Paula, California 93060
maryamb@unitedwater.org

Dear Ms. Bral:

Subject: Draft Environmental Impact Report (DEIR) for the Santa Felicia Dam Safety Improvement Project (Project), SCH: No. 2017041005, Ventura County

The California Department of Fish and Wildlife (CDFW) has reviewed the DEIR (dated October 2018) for the above-referenced Santa Felicia Dam Safety Improvement Project (Project) pursuant to the California Environmental Quality Act (Public Resource Code 21000 et seq.). The DEIR was prepared by United Water Conservation District (UWCD) acting as the CEQA lead agency (CEQA Guidelines §15051). The Project is proposed by UWCD to enhance the safety of Santa Felicia Dam and would include improvements required to ensure the outlet works can withstand loading from the Maximum Credible Earthquake (MCE) and so the spillway can safely convey the outflow from the regulatory Inflow Design Flood (IDF). In addition, intake improvements are proposed to mitigate the accumulation of sediment in the reservoir which is projected to reach the inlet of the intake tower between 2023 and 2025; if sediment accumulates to the crest of and/or above the inlet of the intake tower UWCD may lose the ability to control water releases from the dam.

The Santa Felicia Dam is located approximately 4.5 miles northeast of the unincorporated town of Piru in Ventura County, California. The Project site is accessed from Piru Canyon Road via State Route 126. The Project site is in the Santa Clara River watershed. The Project area consists of waters and wetlands associated with Lake Piru Reservoir and lower Piru Creek. The Sespe Condor Sanctuary, which is designated federal critical habitat for the State fully-protected and federally-listed California condor (*Gymnogyps californianus*), occurs approximately 2.5 miles west of the Project area. Critical habitat for California condor also occurs in Piru Creek and its tributaries approximately 5.5 miles upstream of Santa Felicia Dam. Designated Critical Habitat by the U.S. Fish and Wildlife Service (USFWS) for the federally-listed arroyo toad (*Anaxyrus californicus*) and California red-legged frog (*Rana draytonii*) occurs approximately 2.7 and 3.4 miles, respectively, upstream of Santa Felicia Dam. The nearest Critical Habitat for State- and federally-listed least Bell's vireo (*Vireo bellii pusillus*) is a segment of the Santa Clara River located approximately 2 miles east of the town of Piru and upstream to Castaic Junction, near Interstate 5. This federal Critical Habitat area is approximately 3.5 miles southeast of the Project area (USFWS, 2017a).

The DEIR identifies the following vegetation communities within the Project work area: Coastal and Valley Freshwater Marsh occurs intermittently along the margins of Lake Piru Reservoir and within the spillway channel, lower Piru Creek release channel, and lower Piru Creek. These areas are mapped as ruderal, open water/rock, and Fremont cottonwood forest. Riversidian Alluvial Fan Sage Scrub, mapped as scale broom scrub, is found on floodplain

Conserving California's Wildlife Since 1870

Comment Letter 6 **Erinn Wilson**
California Department of Fish and Wildlife

Ms. Maryam Bral
United Water Conservation District
December 19, 2018
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areas associated with the spillway and lower Piru Creek release channels, and is mapped throughout the southern part of the Project area. Four riparian communities, including Southern Cottonwood Willow Riparian Forest, Southern Mixed Riparian Forest, Southern Riparian Scrub and Southern Willow Scrub are found intermittently along the spillway channel, lower Piru Creek release channel, and lower Piru Creek. Within the Project area, these areas are mapped as open water/rock and Fremont cottonwood forest based on overstory dominance of that species.

The DEIR identifies the following special status species as observed in the Project work areas. Individuals of slender mariposa lily (*Calochortus clavatus* var. *gracilis*) were observed within the Project area and vicinity during annual vegetation monitoring in 2016 (BRC, 2016). Arroyo chub (*Gila arcuifili*) and Santa Ana sucker (*Catostomus santaanae*) were observed in lower Piru Creek during surveys conducted in 2003 (UWCD, 2004c). These species are also known to occupy Lake Piru Reservoir and Piru Creek upstream of the reservoir (UWCD 2004c). Southern California steelhead (the form of *Oncorhynchus mykiss* that exhibit the anadromous life history trait) are listed as federally endangered. *Oncorhynchus mykiss* were not observed during surveys conducted throughout lower Piru Creek in 2003. Sightings of special-status reptiles, such as California species of special concern (CSSC) included western pond turtle (*Actinemys marmorata* [CSSC]), Blainville's horned lizard (*Phrynosoma blainvillii*), (coastal) whiptail (*Aspidoscelis tigris stejnegeri* [CSSC]), and two-striped garter snake (*Thamnophis hammondi* [CSSC]). Incidental observations of two CSSC reptiles, coastal whiptail and Blainville's horned lizard, were recorded during annual surveys for the Vegetation and Noxious Weeds Management Plan (BRC 2016). Least Bell's vireo and yellow warbler (*Setophaga petechia*) were observed below the spillway and along lower Piru creek immediately below the current outlet works (Griffith Wildlife Biology, 2016). California condor [FE/SE/CFP] was also observed during the protocol surveys and has been observed soaring over the Project area with a few sightings of temporary landings (Griffith Wildlife Biology, 2016; UWCD observations). Condor nesting has been observed and is monitored by the USFWS in Agua Blanca Creek, a tributary to middle Piru Creek upstream of Lake Piru Reservoir (USFWS, 2016).

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife resources. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code.

CDFW ROLE

CDFW is California's Trustee Agency for fish and wildlife resources and holds those resources in trust by statute for all the people of the state [Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA Guidelines § 15386, subd. (a)]. CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species (Id., § 1802.). Similarly, for purposes of CEQA, CDFW is mandated to provide as available, biological expertise during public agency environmental review, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources.

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CDFW is also submitting comments as a Responsible Agency under CEQA, (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381). CDFW expects that it may need to exercise regulatory authority as provided by the Fish and Game Code. As proposed, for example, the Project may be subject to CDFW's Lake and Streambed Alteration (LSA) regulatory authority. (Fish & G. Code, § 1600 et seq.). Likewise, to the extent implementation of the Project as proposed may result in "take", as defined by State law as any species protected under the California Endangered Species Act (CESA; Fish & G. Code, § 2050 et seq.), or State-listed rare plant pursuant to the Native Plant Protection Act (NPPA; Fish and Game Code §1900 et seq.), related authorization as provided by the Fish and Game Code will be required.

PROJECT DESCRIPTION

Proponent:
United Water Conservation District
106 N. 8th Street
Santa Paula, California 93060

Project Objectives:

The Project consists of two components. The first component would replace the existing outlet works system to address the potential for failure under seismic loading conditions and impacts associated with sedimentation near the existing intake tower. Replacement of the outlet works would also include installation of a new hydroelectric turbine.

Component One. The general attributes of the proposed intake structure construction are as follows:

- Rock cuts would be made to create an approach channel and 45-degree slope for the reinforced concrete mat which would provide the foundation for the intake structure. Side slopes of the rock cut would be at 45-degrees and covered with shotcrete for erosion protection. Consideration will be given during final design to flattening the side slopes to eliminate the need for shotcrete protection.
- Two primary intakes would be constructed for selective withdrawal of reservoir water, one at elevation 953-feet mean sea-level (msl) and the other at elevation 970-feet msl. Flow from each intake would enter the 78-inch- diameter primary conduit. Each intake would be formed by two 12-foot by 12-foot openings in the concrete mat allowing reservoir water to enter concrete-lined trenches that relate to a pipe. The capacity of each intake would be 530 cubic feet per second (cfs) with two openings combined. The two openings of each intake would straddle the north and south sides of the concrete mat resting on the slope. Intakes would be opened/closed with knife gate valves via stems (steel rods) connected to operators located at elevation 1,080-feet msl (on dry ground).
- Two movable fish screens would be installed, one on each side of the sloping intake. Each fish screen would be one-half of a cylinder with a height and radius of approximately 17-feet and eight feet, respectively. Fish screens would be raised periodically to a control building at elevation 1,080-feet msl (see below) using wire ropes and a winching system for cleaning and maintenance.

Response 6.1

Comment noted. CDFW's regulatory authority is discussed in Section 5.5.3.2. UWCD will continue to coordinate with CDFW regarding necessary authorizations and permits.

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- Each 12-foot by 12-foot intake opening would be protected with a trash rack to prevent large debris from entering the outlet works system when the fish screens are not in place.
- A low-flow intake would be constructed, consisting of a small fish screen connected to the 24-inch diameter steel conduit. The fish screen would be detachable for cleaning at the surface. The low-flow intake would be opened/closed with a knife gate valve via a stem connected to an operator at elevation 1,080-feet msl.
- For normal operations, one intake level (two side-by-side 12-foot by 12-foot openings) would be opened at a time. A fish screen would be positioned above each opening to allow for conveyance of the normal maximum discharge of 500 cfs. For emergency dam safety releases, all four openings would be used to allow for discharge of up to 1,060 cfs. Fish screens would not be positioned above the openings during emergency dam safety releases.

Component Two. The second component would increase the conveyance capacity of the existing spillway to sufficiently pass the IDF, which for the Santa Felicia Dam consists of the PMF of 220,000 cfs. The Project does not include an increase in the capacity of the reservoir nor does it propose any changes to the current operations or flow releases from the dam.

COMMENTS AND RECOMMENDATIONS

CDFW offers the recommendations below to assist UWCD in adequately identifying and/or mitigating the Project's significant or potentially significant, direct and indirect impacts on fish and wildlife (biological) resources. For impacts demonstrated to be unavoidable in the DEIR, CDFW recommends measures or revisions below that the UWCD should include in a science-based monitoring program that contains adaptive management strategies as part of the Project's CEQA mitigation, monitoring and reporting program (Public Resources Code 21081.6 and CEQA Guidelines § 15097).

1. **Coordination.** CDFW recommends that UWCD continue to collaborate regarding the Project excavation footprint, dewatering, and other Project-related activities within Santa Felicia Dam. CDFW and UWCD should discuss the long-term sediment removal objectives to prevent future operations of the Dam becoming compromised. CDFW recommends that these long-term goals for coordination of sediment removal be included in the DEIR to avoid, minimize, and mitigate Project-related impacts to biological resources.
2
- A. UWCD should continue coordination with CDFW to refine the Project description for the Final Environmental Impact Report (FEIR) to minimize impacts to sensitive resources and meet objectives of the Project (see Project Objectives).
3
- B. UWCD should meet with CDFW to discuss the need for a CESA Incidental Take Permit (ITP) for impacts to state-listed species (see Table 5.5-1).
4
- C. UWCD should meet with CDFW to discuss the LSA agreement that is necessary for completion of the Project. UWCD should review CDFW's current guidance available on CDFW's website at (<https://www.wildlife.ca.gov/Conservation/LSA/Resources>). (See
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Response 6.2

Comment noted. The proposed Project does not include sediment removal and therefore, sediment removal is not evaluated in the EIR. It is anticipated that operational procedures in the future will be comparable to current operational procedures, including with respect to sediment removal. UWCD will continue to coordinate with CDFW regarding long-term sediment removal objectives to prevent future operations of the dam becoming compromised.

Response 6.3

Comment noted. The Project has been designed to minimize potential impacts to sensitive receptors. As described in Section 5.5.4, impacts to biological resources would be less than significant with implementation of associated mitigation measures (MM BIO-1 through MM BIO-9). UWCD will continue to coordinate with CDFW to achieve the shared goal of protecting natural resources while improving safety of the Santa Felicia Dam.

Response 6.4

Comment noted. The CESA incidental take permit is discussed in Section 5.5.3.2.1. UWCD will meet with CDFW during the federal phase of the approvals process in order to coordinate CDFW concerns in parallel to those that may arise through Endangered Species Act Section 7 Consultation with USFWS and NMFS. UWCD recognizes that the State and Federal processes are separate, but the concerns and accommodations are frequently the same.

Response 6.5

Comment noted. As noted in Section 5.5.3.2.6 and Section 5.10.2.2.2, UWCD would obtain a Streambed Alteration Agreement in accordance with Section 1602 of the CFGC for the realignment of the outlet works discharge channel to lower Piru Creek downstream of Lake Piru Reservoir. United will continue to coordinate with CDFW.

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comment 5.d). It is likely that CDFW would consider activities within entire Santa Felicia Reservoir, including the associated upstream/downstream creeks and tributaries, as subject to notification under the LSA program.

2. **Project-Alternatives Analyses.** Screening-level analysis was conducted to identify a reasonable range of Project alternatives to evaluate at an equivalent level of detail in the DEIR. Based on this screening process, the DEIR includes three alternatives for analyses: the Proposed Project, Alternative 2, and Alternative 3 (see below). Moreover, UWCD has determined that the Proposed Project is the Environmentally Superior Alternative. The proposed Project would include: raising the dam crest by five feet to 1,080-feet msl; demolishing the right chute wall and widening it to approximately 160-feet at the downstream with the same vertical alignment; demolishing the downstream end of the chute and extending it by approximately 50 feet; modifying the access road; providing a new bridge; dewatering the reservoir; and removing built-up sediment.

A. **Riparian Impacts.** CDFW supports the goal to modify the proposed Project in a manner that reduced impacts to biological resources. While the preferred project may qualify as Environmentally Superior Alternative, its proposed configuration could result in the type conversion of sensitive habitats and require activities within the active stream channel to establish willow riparian habitat within the upstream portion of the reservoir/existing wash.

B. **Suitability of Mitigation Sites.** CDFW is concerned that the DEIR does not identify mitigation sites and if any hydrology will be necessary to support revegetation of areas disturbed by Project-related activities with riparian habitats.

C. **Engineering/Maintenance Requirements.** CDFW is also concerned about the engineering necessary to stabilize the proposed Alternatives. Episodic stream systems, such as like Piru Creek, tend to move across the entire alluvial streambed versus a perennial stream utilizing one stable primary channel.

D. **Additional Recommendations.** Based on the above concerns, CDFW recommends UWCD consider the following modifications, measures, or studies for inclusion in the FEIR to further minimize and avoid significant impacts of the Project to biological resources:

i. The FEIR should include a measure to require analyses of the hydrology and hydraulics (including sediment transport) in Piru Creek upstream of the dam. These analyses will help determine the effects to the stream and habitat upstream of the area selected for Reservoir Management.

ii. Continue to work with CDFW to modify the final design of the Project to minimize impacts to sensitive habitats. A CDFW hydrologists is available to assist UWCD with input on study and stream design. In addition, CDFW recommends further

Response 6.6

Comment noted. The Project has been designed to minimize potential impacts to sensitive receptors and habitats, including providing for continued irrigation of the existing willow riparian habitat at the existing outlet works. Areas upstream of Santa Felicia Dam were not assessed for potential Project impacts because the Project would not affect upstream areas. The analysis provided in the EIR will be utilized by UWCD to select the preferred project design. UWCD will continue to coordinate with CDFW through this process.

Response 6.7

MM BIO-4: Design and construct a geomorphically stable channel connecting the new outlet works release point to the main lower Piru Creek channel, identifies a new 200-ft channel from the newly constructed outlet works channel to lower Piru Creek as mitigation for the abandoned outlet works channel. As described in Section 3.1.4, irrigation would be provided for the existing riparian vegetation along the portions of the existing lower Piru Creek channel that would be abandoned to maintain the existing riparian habitat for least Bell's vireo, southwestern willow flycatcher, and other species.

Response 6.8

Comment noted; this concern is addressed through MM BIO-4: Design and construct a geomorphically stable channel connecting the new outlet works release point to the main lower Piru Creek channel, which provides design criteria and design elements to stabilize the channel.

Response 6.9

The hydrology and sediment transport in the Project area are discussed in Section 5.10.1 Existing Conditions. No changes to upstream hydrology and associated geomorphic effects would occur as a result of the Project. Therefore, no additional hydrology, hydraulic, or sediment transport analysis upstream of the dam is necessary.

Response 6.10

Comment noted. UWCD will continue to coordinate with CDFW. Section 5.5 Biological Resources did not identify changes upstream of the reservoir that could lead to a significant impact.

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analysis of the existing and historical habitat communities on-site to further develop appropriate vegetation plans for the upstream portion of the reservoir.

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- ii. CDFW recommends that UWCD include a measure within the FEIR to evaluate and confirm the suitability of riparian vegetation to be established within mitigation sites based on hydrologic information prior to implementation.

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- 3. **Southern California steelhead.** The DEIR (Section 2.4.3) Proposes no change in water flow regime, release schedule, or storage capacity. The DEIR alternatives do not appear to analyze any proposed changes to mandated protections for the Southern California steelhead. It appears that Santa Felicia Dam would continue to operate so that the following standards are maintained after safety improvements, until such time that the environmental review for the Federal Energy Regulatory Commission (FERC) studies have been completed by UWCD:

- A. Provide unimpeded migration of adult and juvenile Southern California steelhead in Piru Creek downstream of Santa Felicia Dam and in the Santa Clara River from the confluence of Piru Creek downstream to the Freeman Diversion structure.

- i. Form and preserve freshwater rearing sites for Southern California steelhead throughout Piru Creek downstream of Santa Felicia Dam.
- ii. Create and maintain freshwater spawning sites (including incubation and emergence life stages of Southern California steelhead) for Southern California steelhead throughout Piru Creek downstream of Santa Felicia Dam.

- B. To accomplish these goals, the Water Release Plan contains three water release schedules:

- i. Habitat Water Release Schedule
- ii. Migration Water Release Schedule
- iii. Alternative Operations Water Release Schedule

- C. Since its approval by National Marine Fisheries Service (NMFS) in 2012, UWCD has operated Santa Felicia Dam in accordance with the Water Release Plan. The standard operation follows the habitat and migration water release schedules. However, under certain circumstances (e.g., during inspection, maintenance, and repair activities), UWCD would implement the alternative operations water release schedule. The DEIR should confirm that the Proposed Project would not impact these water release schedules.

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- 4. **Noise-Unavoidable Significant Impact.** CDFW recommends all noise levels be evaluated using the Noise Pollution Clearinghouse (NPC, 2012) for noise levels to prevent spillover into open space areas. CDFW further recommends that all Best Management Practices (BMPs) be established to prevent drift of noise from Project-related activities into the adjacent open space areas where numerous special status species have been observed, including nesting birds. Generally speaking, a decibel (dba) of 2.0 dba has

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Response 6.11

Comment noted; this concern is addressed through MM BIO-4: Design and construct a geomorphically stable channel connecting the new outlet works release point to the main lower Piru Creek channel, which provides design criteria and design elements to promote a healthy riparian zone at the new outlet channel, including providing aquatic habitat cover and complexity using features such as rootwads, large wood, rock weirs, etc.; and creating riparian habitat along streambanks to provide cover and minimize erosion at a buffer width appropriate with the geomorphic and hydrologic setting in accordance with guidelines provided in the California Salmonid Restoration Manual (Flosi et al. 2010), the Stream Restoration Design – National Engineering Handbook (NRCS 2007), and other relevant design guidelines.

Response 6.12

Water releases are planned to continue per existing operations during construction, as described in Section 5.10.3.1 of the DEIR. Therefore, the Project would not impact water release schedules identified in the Water Release Plan.

Response 6.13

Comment noted. The following text has been added to MM BIO-5: Protection of nesting birds: "UWCD shall coordinate with CDFW to establish a Nesting Bird Plan prior to Project construction." As described in Section 5.13 the Noise section, even with all feasible mitigation, Project-related noise levels are likely to remain significant.

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been found to disturb some sensitive nesting bird species likely leading to nest abandonment (NPC, 2012) and take of nesting birds. CDFW Fish and Game Code § 3503, 3503.5, and 3513 prohibit the take of nesting birds and their nests. In addition, UWCD should coordinate with CDFW to establish a nesting bird plan to prevent the unnecessary disturbance to nesting birds within the Project work area from Project construction and/or periodic increases in ambient noise levels.

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5. **Impacts to Least Bell's Vireo.** The DEIR (page 5.5-16) indicates that least Bell's vireo has been observed within the Project footprint, is known to be present (based on protocol surveys conducted in 2016), and is also designated Critical Habitat for this species. The DEIR indicates Project-related activities would result in the removal of habitat for least Bell's vireo (riparian woodland and mule fat scrub) resulting in potential direct harm or take of this federal- and state-listed species. The DEIR concludes this impact could be mitigated to less than significant with implementation of MM BIO 1 (Pre-construction Vegetation Surveys), MM BIO 2 (Identify and Implement BMPs, and MM BIO 3 (Vegetation Restoration Plan).

If Project implementation has the potential to result in take of a species designated as endangered or threatened, or a candidate for listing under CESA, CDFW recommends that UWCD seek appropriate take authorization prior to implementing the Project or Project-related activities. Appropriate authorization from CDFW may include an ITP or a consistency determination in certain circumstances, among other options [Fish and Game Code §§ 2080.1, 2081, subds. (b), (c)]. Conditions within the ITP will assure impacts to State-listed species will be minimized to the maximum extent feasible and fully mitigated. Early consultation with CDFW regarding potential permitting obligations under CESA is encouraged since modification of the proposed project may be required to avoid or reduce impacts to state listed species. UWCD should consult with CDFW regarding anticipated Project-related "take" of least Bell's vireo to determine the need for an ITP.

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6. **Vegetation Classification and Calculations.** The DEIR uses both Holland Code (Holland, 1986) and Sawyer et al. 2009 to classify vegetation communities. CDFW recommends the DEIR vegetation classification mapping follow the Second Edition of the Manual of California Vegetation (MVC) and include associated acreage for each vegetation alliance. This standardized vegetation classification has been accepted by state and federal agencies. The principal unit in the MVC is called an *Alliance* (or Series). Alliances are a floristically defined vegetation type identified by its dominant and/or characteristic species in the upper layer of vegetation. For example, the DEIR (Figure 5.5-1) classifies Toyon Chaparral, California Sagebrush, Scaleborom Scrub, Fremont Cottonwood Forest, and Open Water/Rocky habitats but does not provide any corresponding acreages. Without providing acreages of vegetation alliances, it is difficult to establish significance of impacts to sensitive habitats. The DEIR should cross reference the Holland Code into the standardized statewide (compliant with the National Vegetation Classification Systems) nomenclature supported by CDFW. For more information on conversions, please see http://www.dfg.ca.gov/bioeodata/vegcomp/pdfs/NaturalCommunitiesList_Oct07.pdf.

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7. **Sensitive Reptiles and Amphibians.** As described in the DEIR, the Project area supports habitat for the federally-endangered arroyo toad and California red legged-frog. CDFW recommends USFWS protocol level surveys be performed for these species prior to

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Response 6.14

Comment noted. UWCD will meet with CDFW during the federal phase of the approvals process in order to coordinate CDFW concerns in parallel to those that may arise through Endangered Species Act Section 7 Consultation with USFWS and NMFS. UWCD recognizes that the State and Federal processes are separate, but the concerns and accommodations are frequently the same. UWCD will consult with CDFW regarding the need for an ITP.

As noted in Impact BIO-3, impacts to special-status birds would be less than significant with implementation of MMs BIO-1 through BIO-5.

Response 6.15

As described in Section 5.5.2.1, previous site-specific vegetation community mapping and classification using Holland 1986 was refined and updated during recent surveys in 2017, using A Manual of California Vegetation, Second Edition (Sawyer et al. 2009). Both Holland classifications and Sawyer et al. alliances are described in the text. The following text has been added to Section 5.5.2.1 to represent the total acres of each community shown in Figure 5.5.-1: "The following acreage is shown in the figure: 51.57 acres of toyon chaparral (*Heteromeles arbutifolia* Shrubland Alliance); 393.24 acres of California sagebrush-black sage scrub (*Artemisia californica*-*Salvia mellifera* Shrubland Alliance); 7.97 acres of California buckwheat scrub (*Eriogonum fasciculatum* Shrubland Alliance); 25.57 acres of scale broom scrub (*Lepidospartum squamatum* Shrubland Alliance); 34.21 acres of Fremont cottonwood forest (*Populus fremontii* Forest Alliance); 22.07 acres of non-native grassland; 19.42 acres of ruderal area; 52.86 acres of open water/rock; and 155.99 acres of developed land."

Response 6.16

Pre-construction surveys have been included in the FEIR as a new mitigation measure: "MM BIO-6: Conduct pre-construction special-status amphibian and reptile surveys. Prior to construction activities, USFWS protocol-level surveys shall be performed by a qualified biologist for special-status amphibians and reptiles. If special-status species are observed in areas planned for temporary or permanent disturbance, UWCD shall develop a plan to avoid impacts (MM BIO-2) that is specific to each species. If impacts cannot be avoided, UWCD

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implementation of any Project-related activities, including staging. The Project site also supports known occupied habitat for several CSSC including coast horned lizard and western spadefoot toad (*Spea hammondi*), in addition to the other species identified in Table 5.5.4 in the DEIR. Surveys for these species should also be conducted and focused within appropriate areas of the Project site.

- 16
8. **Impacts to Streams.** The Project site contains lake or streambed resources including freshwater emergent wetlands dominated by cattail (*Typha* sp.) that occupy shallow depths of the spillway channel, spillway pond, and small isolated patches within the wetted portion of the lower Piru Creek release channel. These areas are classified as cattail marshes [*Typha* (*angustifolia*, *domingensis*, *latifolia*) Herbaceous Alliance] (Sawyer et al. 2009); however, the DEIR (page 5.5-12) describes that these areas were too small to warrant mapping and have been included in the open water/rock cover type. CDFW has regulatory authority over activities in streams and/or lakes that will divert or obstruct the natural flow; or change the bed, channel, or bank (which may include associated riparian resources) of a river or stream or use material from a streambed. For any such activities, the Project applicant (or "entity") must provide written notification to CDFW pursuant to Section 1600 et seq. of the Fish and Game Code. Based on this notification and other information, CDFW determines whether a LSA with the applicant is required prior to conducting the proposed activities. CDFW issuance of a LSA for a Project that is subject to CEQA will require CEQA compliance actions by CDFW as a responsible agency. CDFW as a responsible agency under CEQA may consider the Lead Agency's EIR for the Project. To minimize additional requirements by CDFW pursuant to Section 1600 et seq. and/or under CEQA, the DEIR should fully identify the potential impacts to the stream or riparian resources, including freshwater emergent wetlands dominated by cattail, and provide adequate avoidance, mitigation, monitoring and reporting commitments for issuance of the LSA.

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CDFW has regulatory authority over all streams, including intermittent and alluvial fan streams. CDFW recommends a qualified hydrogeomorphologist familiar with assessments in drylands watersheds UCWD conduct the stream delineation required for the Project. Those maps and results should be included in the DEIR.

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9. **Impacts to Oak Trees.** The DEIR in Section 5.5 indicates that proposed access roads, staging areas, and spoil sites may remove oak trees to accommodate Project-related activities. CDFW recommends the DEIR identify and map how many oak trees are proposed for removal and analyze the removal based on California Public Resources Code Section 21083.4 (2004 Senate Bill 1334). If removal of these oaks is considered significant (either individually or cumulatively), they should be mitigated as directed by the law. Acceptable mitigation measures include (but are not limited to) conservation of other oak woodlands using conservation easements and planting replacement trees, which should be maintained for ten years.

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10. **Sensitive Plant Species.** The DEIR (Table 5.5-2, Page 5.5-5) states "the California CDFW of Fish and Wildlife (CDFW) [sic] California Natural Diversity Database (CNDDDB 2009) and California Native Plant Society's Electronic Inventory (CNPSEI) of Rare and Endangered Vascular Plants of California (CNPSEI 2009) were reviewed for the quadrangles containing and surrounding the project site. CDFW recommends performing a nine (9) quadrangle search to develop a more inclusive and accurate list of potentially occurring plant and animal species within the Project area. Frequently, plant and animals

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shall consult with CDFW and/or USFWS in accordance with the State and Federal ESA." Prior to inclusion of this MM, the DEIR found potential impacts to special-status amphibians and reptiles to be significant but mitigable. This MM will further reduce impacts to special-status amphibians and reptiles.

Response 6.17

As described in Section 3.1.4, irrigation would be provided for the existing riparian vegetation along the portions of the existing lower Piru Creek channel that would be abandoned to maintain the existing riparian habitat for least Bell's vireo, southwestern willow flycatcher, and other species. Section 5.5.3.2.6 states "As part of this Project, UWCD would obtain a Streambed Alternation Agreement in accordance with Section 1602 of the FGC for the realignment of the outlet works discharge to lower Piru Creek downstream of Lake Piru Reservoir."

Response 6.18

The DEIR Hydrology section includes description of the existing hydrogeomorphology of the Project affected area of lower Piru Creek. As described in Section 5.10.2.1.1, under Section 404 permitting, a formal jurisdictional delineation will be conducted and submitted to the USACE as part of the Project documentation. Changes proposed to this system at the new outlet works has been described and mitigation provided under MM BIO-4: Design and construct a geomorphically stable channel connecting the new outlet works release point to the main lower Piru Creek channel.

Response 6.19

The proposed Project does not entail the removal of oak trees and as such, there would be no impact to oak trees and no mitigation necessary.

Response 6.20

A nine-quadrangle search was conducted. Section 5.5.1.1 states: "The CNPS Inventory database queries included the Piru Creek 7.5-minute quadrangle, as well as the surrounding eight quadrangles of Devils Heart Peak, Cobblestone Mountain, Whitaker Peak, Fillmore, Val Verde, Moorpark, Simi Valley and Santa Susana. Additionally, the CNDDDB query included three quadrangles to the east: Warm Spring Mtn., Newhall, and Oat Mtn."

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are observed in areas where they were not detected historically. As a recent example, slender mariposa lily was detected during surveys for invasive plants, of which 153 individuals were documented were they previously had not been observed.

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11. **Plant Surveys.** The DEIR indicates botanical surveys were conducted in 2004, however the DEIR does not appear to include recent updated focused surveys. The DEIR lists of surveys (page 5.5-3) indicates surveys are now outdated and were conducted outside normal floristic survey windows. CDFW recommends the DEIR identify when the last floristic surveys were conducted. If focused surveys are older than two years, new surveys should be conducted and the results included in the DEIR. CDFW recommends floristic surveys adhere to the CDFW's Guidelines for Assessing Impacts to Rare Plants and Rare Natural Communities. (See Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities at: <http://www.dfg.ca.gov/habcon/cjant/>).

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12. **Reference Sites.** The DEIR does not indicate if reference sites were visited to verify that plants potentially occurring on-site were blooming at known locations. For example, Conejo dudleya (*Dudleya abramsii* ssp. *parva*), a rare plant that has the potential to occur on-site, blooms between March and June (http://www.calflora.org/cgi-bin/species_query.cgi?where-calrecnum=10468) and could have been missed if surveys were conducted outside this period. Conejo dudleya has been found in Ventura County in previously unknown areas and should be considered potentially present, among the other listed rare plants.

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13. **Potential Plant Species.** CDFW recommends surveys conducted during the appropriate time of year and conditions be performed for all the species identified in Table 5.5-1 as these species occur throughout the flowering season (consult the Jepson Manual, Second Edition (*Baldwin et al. 2012*) for a range of blooming times for each species).

23

The DEIR indicates that all species with moderate occurrences were not considered to be potentially present because these records do not reflect current conditions within and adjacent to the Piru Reservoir and Lower Creek. CDFW survey guidelines, as stated above, should be used when conducting plant surveys. The modification of the Piru Creek does not necessarily mean these plants do not persist near the project area. This is especially true given the recent discovery of slender-spine mariposa lily previously thought not to occur on-site.

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14. **Plant Taxonomy.** The scientific names used for botanical specimens should reflect the recent revision to the taxonomy of many of the plant families present on-site. CDFW recommends the DEIR use the taxonomy used in the second edition to the Jepson Manual (*Baldwin et al. 2012*).

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15. **Mitigation Measure MM-BIO-1. Conduct Pre-Construction Vegetation Surveys.** MM-BIO-1 of the DEIR provides that, "[p]rior to construction, UWCD shall ensure that protocol surveys for special-status plant species are completed by a qualified biologist during the appropriate time of year. Surveys shall occur within one year of construction commencement. If special-status species or plant communities are observed in areas planned for temporary or permanent disturbance, UWCD shall develop a plan to avoid impacts (MM BIO-2) that is specific to each species. If impacts cannot be avoided,

Response 6.21

The FEIR provides the requested information related to the most recent floristic surveys and their timing (2004 - noted in Sections 5.5.2.1 and 5.5.2.4). The DEIR applied a habitat-level field survey and determined potential Project impacts accordingly.

The Project has been designed to minimize potential affects to plant resources. As such, MM BIO-1: Conduct pre-construction vegetation surveys, includes the requirement for pre-construction vegetation surveys. The following text has been edited added to MM BIO-1: "Surveys shall be conducted according to CDFW's Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (CDFW 2018)".

Response 6.22

Protocol surveys completed in 2003, and referenced in EIR, followed 2000 Guidelines for Assessing Effects of Proposed Projects on Rare, Threatened and Endangered Plants and Natural Communities, the current survey guideline at the time. The survey conducted on April 24, 2017 was a general field survey and did not utilize reference sites. As noted in Table 5.5-2, the conejo dudleya has low potential to occur in the Project Area. However, the following text has been added to MM BIO-1: Conduct pre-construction vegetation surveys, to clarify that pre-construction protocol surveys shall be conducted " according to Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (CDFW 2018)".

Response 6.23

The DEIR applied a habitat-level field survey and determined potential Project impacts accordingly. MM BIO-1: Conduct pre-construction vegetation surveys, specifies a requirement for pre-construction floristic surveys. The following text has been edited added to MM BIO-1: "Surveys shall be conducted according to CDFW's Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (CDFW 2018)", which requires surveys to be conducted at the time of year when plants are evident and identifiable.

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UWCD shall consult with CDFW and/or USFWS in accordance with the State and Federal ESA."

MM-BIO-1 in the DEIR should clarify that a biological monitor will be on-site during the Project's initial ground or vegetation disturbances to implement protective measures. In addition, CDFW recommends the FEIR identify what protective measures will be implemented by the biological monitor. Additionally, the DEIR appears to omit the need for on-site and off-site compensatory mitigation that would be used to replace sensitive habitat and jurisdictional waters removed by the Project at no less than a 1:1 ratio.

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CDFW further recommends that any mitigation for unavoidable impacts to biological resources take place in the following order of preference: on-site; off-site within the Piru Creek Watershed; and, off-site within the greater Santa Clara River watershed. Compensatory mitigation should be conducted at locations that lend themselves to riparian creation, restoration, and/or enhancement opportunities; wildlife movement and connectivity; and, be preserved, protected and managed in perpetuity. Areas proposed as mitigation lands should be protected with a conservation easement, include financial assurance and be dedicated to a qualified entity for long-term management and monitoring. Under Government Code section 65967, the lead agency must exercise due diligence in reviewing the qualifications of a governmental entity, special district, or nonprofit organization to effectively manage and steward land, water, or natural resources on mitigation lands it approves.

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An example of a feasible opportunity for riparian mitigation include riparian restoration along portions of the existing concrete lined section of the of Piru Creek that flows through the Piru Ponds. The Piru Ponds offers sufficient area to replace some of the riparian resources removed from the Project. CDFW recommend that UWCD evaluate the potential for restoration at the Piru Ponds in coordination with the United States Forest Service (Padres National Forest).

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CDFW also recommends UWCD consider discussing potential mitigation opportunities within the Santa Clara River with entities including (but not limited to): Santa Monica Mountains Conservancy (<http://www.smmc.ca.gov/contact.html>); Arroyo and Foothill Conservancy (<http://www.arroyosfoothills.org>); and, the U.S. Army Corps of Engineers: (<http://www.spl.usace.army.mil/Media/FactSheets/tabid/1321/Article/13010/arroyo-seco-watershed-ca.aspx>).

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16. **Mitigation Measure MM-BIO-2 (Identify and Implement Best Management Practices).** The DEIR in MM-BIO-2 provides that, "UWCD shall identify BMPs to reduce and/or eliminate construction-related impacts and develop a plan to implement these measures. Measures shall include but not be limited to a Worker Environmental Awareness Program (WEAP), designated work areas, fire prevention, dust control, vehicle/equipment idling restrictions and speed limits, night-time work restrictions, designation of a Project Biologist with authority to stop work, litter control program, biological monitoring, weed prevention, erosion and sediment control, hazardous materials management, and spill prevention and clean up."

MM-BIO-2 in the DEIR should clarify that a biological monitor be on-site during vegetation and ground disturbance activities during the life of the Project, including maintenance activities, to capture and relocate out of harm's way any species of low mobility that may be

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Response 6.24

The slender mariposa lily and special-status plant species with moderate to high potential to occur in the Project area are discussed in Impact BIO-1. Please see comment response 6.23.

Response 6.25

Scientific names have been updated as requested in Section 5.5 Biological Resources.

Response 6.26

The designation of a Project Biologist with stop work authority was included in MM BIO-2: Identify and implement BMPs, of the DEIR. The following text has been added to MM BIO-2: "A Project Biologist shall be present onsite during the Project's ground and/or vegetation disturbances, The Biologist shall have the authority to stop work, and shall be present to capture and relocate out of harm's way any species of low mobility that may be killed or injured during construction. Any captured species shall be relocated to adjacent and appropriate habitat not impacted by Project-related disturbance activities. All vegetation removal shall take place in a manner that allows wildlife to escape to contiguous, adjacent habitat."

As described in Section 3.1.4 and Section 5.5.4.2, impacts to riparian vegetation would be offset by irrigation of the abandoned existing outlet works channel. Therefore, there would be no loss of habitat at this location. Further, as described in Impact BIO-8, Relocation of the outlet works system would result in the dewatering of between 480-foot and 1,200-feet of existing channel in lower Piru Creek (depending on the final design), resulting in a permanent loss of waters and any wetlands associated with the channel. However, prior to implementation, UWCD would obtain a Section 404 permit and Streambed Alteration Agreement, both of which would include required compensatory mitigation (most likely in the form of MM BIO-4, Design and Construct a Geomorphically Stable Channel connecting the New Outlet Works Release Point to the Main Lower Piru Creek Channel). Therefore, no additional mitigation is required.

Response 6.27

As described in Section 3.1.4 and Section 5.5.4.2, impacts to riparian vegetation would be offset by irrigation of the abandoned existing

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killed or injured. Any captured species should be relocated to adjacent and appropriate habitat not impacted by project-related disturbance activities. MM-BIO-2 should also provide that all vegetation removal should take place in a manner that allows wildlife to escape to contiguous, adjacent habitat. This will avoid situations where wildlife seek cover in islands or isolated of habitat, only to be potentially killed or injured during later removal of this cover.

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17. **Mitigation Measure MM BIO-3 (Prepare and Implement an Upland Revegetation and Aquatic, Riparian, and Wetland Restoration Plan).** The DEIR in MM-BIO-3 describes that, "[p]rior to the disturbance of sensitive native plant communities and abandonment of the existing lower Piru Creek release channel, UWCD shall develop an Upland Revegetation and Aquatic, Riparian, and Wetland Restoration Plan (Restoration Plan) to describe measures to be implemented to restore and revegetate all native upland habitats, and create or restore all aquatic riparian habitat, including Federal and State jurisdictional wetlands and waters at a ratio established by Project permits as part of the new proposed outlet works channel. The Restoration Plan shall include details on creating suitable geomorphology and hydrology, as well as revegetation with native plant materials. The Restoration Plan shall establish interim and final performance criteria and a monitoring and reporting schedule. This plan shall be approved by the relevant permitting agencies (USACE, USFWS, NMFS, SWRCB, CDFW) prior to the onset of construction."

CDFW recommends that a conceptual/draft habitat revegetation plan be included in the DEIR for review and comment. Plans for restoration and re-vegetation should be prepared by persons with expertise in southern California ecosystems and native plant restoration techniques. Plans should identify the assumptions used to develop the proposed restoration strategy. Each plan should include, at a minimum: (a) the location of restoration sites and assessment of appropriate reference sites; (b) the plant species to be used, sources of local propagules, container sizes, and seeding rates; (c) a schematic depicting the mitigation area; (d) a local seed and cuttings and planting schedule; (e) a description of the irrigation methodology; (f) measures to control exotic vegetation on site; (g) specific success criteria; (h) a detailed monitoring program; (i) contingency measures should the success criteria not be met; and (j) identification of the party responsible for meeting the success criteria and providing for conservation of the mitigation site in perpetuity. Monitoring of restoration areas should extend across a sufficient time frame to ensure that the new habitat is established, self-sustaining, and capable of surviving drought.

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18. **MM BIO-4 (Design and Construct a Geomorphically Stable Channel Connecting the New Outlet Works Release Point to the Main Lower Piru Creek Channel).** The DEIR in MM-BIO-4 states, "...all discharges from the downstream control facilities and hydropower plant shall enter a new approximately 200-foot long discharge channel lined with riprap immediately downstream of the release point. Portions of the riprap shall be grouted to increase its resistance to erosion. Flows from the fixed-cone valves shall spray into the open air, with high velocity flows landing within the riprap discharge channel. The discharge channel shall then transition to an unlined channel connecting it to the existing lower Piru Creek channel. In addition to enhancing safety and operations of the Project by conveying the range of flows required by the Santa Felicia Hydroelectric Project FERC license and the DSOD, the new release channel shall be designed to: 1) provide high-quality spawning and rearing habitat for southern California steelhead; 2) create as much aquatic and riparian habitat as possible within the available area downstream of the proposed fish passage facility footprint; and, 3) establish a geomorphically stable channel

outlet works channel. Further, MM BIO-4: Design and construct a geomorphically stable channel connecting the new outlet works release point to the main lower Piru Creek channel, would replace the abandoned channel. All potential impacts to biological resources evaluated in the EIR are less than significant or significant but mitigable with proposed mitigation measures. Therefore, further mitigation is not necessary. In addition, no significant and unavoidable impacts to biological resources were identified in the EIR. All potentially significant impact that could occur during construction activity would be mitigated through MM BIO-1 - Conduct pre-construction surveys, MM BIO-2 - Identify and Implement best management practices, and MM-BIO-3 - Prepare and implement an Upland Revegetation and Aquatic, Riparian, and Wetland Restoration Plan. Implementation of these measures would ensure that sensitive plant species are identified and located, if on site, avoided to the extent feasible, and if unable to be avoided, are replaced or restored following completion of construction activity.

Response 6.28

Comment noted. The Piru Ponds have not been considered for mitigation as further mitigation is not necessary. Please see Comment Response 6.27. UWCD will continue to coordinate with CDFW and USFS during planning and implementation of the Project.

Response 6.29

Comment noted. UWCD will continue to collaborate with local agencies throughout Project planning and implementation.

Response 6.30

The designation of a Project Biologist with stop work authority was included in MM BIO-2: Identify and implement BMPs, of the DEIR. The following text has been added to MM BIO-2: "A Project Biologist shall be present onsite during the Project's ground and/or vegetation disturbances, The Biologist shall have the authority to stop work, and shall be present to capture and relocate out of harm's way any species of low mobility that may be killed or injured during construction. Any captured species shall be relocated to adjacent and appropriate habitat not impacted by Project-related disturbance activities. All vegetation removal shall take place in a manner that allows wildlife to escape to contiguous, adjacent habitat."

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that would be designed with an appropriate slope and dimensions to convey the estimated sediment loads without excessive scour or deposition. Accordingly, the following design criteria shall be used to meet these objectives:

- A. Pool-riffle habitat at a frequency appropriate with the geomorphic and hydrologic setting in accordance with guidelines provided in the California Salmonid Restoration Manual (Flosi et al. 2010), the Stream;
- B. Restoration Design – National Engineering Handbook (NRCS 2007), and other relevant design guidelines;
- C. High-flow refugia using side channels and/or high-flow bench or floodplain areas;
- D. Pools of sufficient depth to provide high-quality rearing habitat in accordance with guidelines provided in the California Salmonid Restoration Manual (Flosi et al. 2010);
- E. Aquatic habitat covers and complexity using features such as rootwads, large wood, rock weirs, etc.;
- F. Riparian habitat along streambanks to provide cover and minimize erosion at a buffer width appropriate with the geomorphic and hydrologic setting in accordance with guidelines provided in the California Salmonid Restoration Manual (Flosi et al. 2010), the Stream Restoration Design – National Engineering Handbook (NRCS 2007), and other relevant design guidelines; and,
- G. Consistency with objectives established in other resource protection plans developed in compliance with the 2008 FERC license and associated biological opinion issued by NMFS."

CDFW recommends the EIR include a requirement for UWCD to consult with CDFW regarding anticipated Project-related impacts to fish, Arroyo chub and Santa Ana sucker. The DEIR should include language for UWCD to coordinate early consultation with CDFW fisheries biologists to ensure all best management practices for conservation and protection of fish species occurs during all phases of Project implementation.

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19. **Mitigation Measure MM-BIO-5. Protection of Nesting Birds.** The DEIR in MM-BIO-5 provides that, "[c]onstruction activities shall be scheduled to avoid direct impacts on riparian habitat (i.e., trimming or removal of vegetation) associated with the spillway, existing outlet channel, and lower Piru Creek during the nesting bird season, from March 15th to September 15th. Removal of potential nesting habitat (e.g., trees and shrubs) necessary for construction activities shall be conducted before the nesting bird season to the extent feasible and practicable. If work in habitat suitable for nesting must be scheduled during this period, a pre-construction survey by a qualified biologist shall be completed to confirm that active nests would not be affected. If an active nest is detected within the construction area, work shall be halted and redirected away from the site. In this situation, a qualified biologist, in cooperation with CDFW and USFWS, shall determine a no-work buffer zone to ensure that construction activities would not result in disturbance to the active nest or cause a breeding bird to abandon its nest. The no-work

Response 6.31

MM-BIO-3: Prepare and implement an Upland Revegetation and Aquatic, Riparian, and Wetland Restoration Plan, identifies the need for and content of the plan. The Plan will include all elements required by CDFW. The draft plan will be prepared and subject to CDFW review as the final design is completed and prior to Project implementation; the Draft Plan is not attached to the EIR because final engineering design is not yet complete for the proposed Project.

Response 6.32

The following text has been added to MM BIO 4: Design and construct a geomorphically stable channel connecting the new outlet works release point to the main lower Piru Creek channel: "UWCD shall coordinate early consultation with CDFW to ensure all BMPs for conservation and protection of fish species (including Arroyo chub and Santa Ana sucker) occurs during all phases of Project implementation."

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buffer zone shall remain in effect until the young have fledged or the qualified biologist has determined that the nest is no longer active.

CDFW recommends that a conceptual/draft nesting bird avoidance plan be included in the DEIR for review. Plans for avoidance of nesting birds should be prepared by persons with expertise in nesting bird survey techniques and monitoring. Plans should identify the assumptions used to develop the proposed nesting bird avoidance plan and selection of appropriate buffers to avoid nest abandonment. Each plan should include, at a minimum: (a) the species of birds observed utilizing site-specific nesting habitat; (b) the selection of appropriate buffers based on those species ability to withstand disturbance from Project-related activities; (c) a list of actions to implement should it be determined by a monitoring biologist nest are being disturbed by Project-related activities; (e) a description of the methodology utilized to establish buffers to quality habitat adjacent Project boundaries; (f) measures to control noise and dust spillover into occupied habitat by nesting birds onsite and off-site; (g) specific success criteria to determine if a nest has been disturbed, if parents of fledglings have become agitated, or if parents are spending too much time away from nests that could lead to nest abandonment. Monitoring of habitat both onsite and adjacent to the Project areas should continue while any work is conducted during the nesting season.

20. **Mitigation Measure MM-BIO-6. Amphibian and Reptile Relocation During Dewatering of the Portion of Lower Piru Creek to be Abandoned.** The DEIR in MM-BIO-6 states:

"[w]ithin 90 days prior to ground-disturbing activities, a preconstruction survey shall be conducted by a qualified biologist for the presence of any sensitive species in harm's way ...". CDFW recommends the DEIR require that any special status species observed on the project site be recorded on a California Natural Diversity Data Base (CNDDDB) field data sheet and submitted to the CDFW for inclusion into the CNDDDB. In addition, the DEIR should include a discussion of potential impacts to bats and the need for surveys and protective measures. It was not clear from our reading of the DEIR if this measure was proposed to make conclusions regarding significant impacts from the Project on special status bat species. To avoid the direct loss of bats that could result from removal of trees and/or structures that may provide maternity roost habitat (e.g., in cavities or under loose bark), CDFW recommends that the following measures be included in the DEIR:

- A. Use of acoustic recognition technology to maximize detection of bat species to minimize impacts to sensitive bat species;
- B. To the extent feasible, schedule tree removal or relocation between October 1st and February 28th, outside of the maternity roosting season;
- C. If trees and/or structures must be removed during the maternity season (March 1 to September 30th), a qualified bat specialist should conduct a pre-construction survey to

Response 6.33

MM-BIO-5: Protection of nesting birds, identifies the need for and content of the plan. The Plan will include all elements required by CDFW. The draft plan will be prepared and subject to CDFW review as the final design is completed and prior to Project implementation; the Draft Plan is not attached to the EIR because final engineering design is not yet complete for the proposed Project.

Response 6.34

The following mitigation measure has been added to the EIR in response to this comment and Comment 6.16: "MM BIO-6. Conduct pre-construction special-status amphibian and reptile surveys. Prior to construction activities, USFWS protocol-level surveys shall be performed by a qualified biologist for special-status amphibians and reptiles. If special-status species are observed in areas planned for temporary or permanent disturbance, UWCD shall develop a plan to avoid impacts (MM BIO-2) that is specific to each species. If impacts cannot be avoided, UWCD shall consult with CDFW and/or USFWS in accordance with the State and Federal ESA. Any special status species observed on the project site be recorded on a CNDDDB field data sheet and submitted to the CDFW for inclusion into the CNDDDB."

Response 6.35

The Biological Resources section states that bats could forage in Project area but are not likely to breed/roost due to lack of suitable habitat. MM BIO-7 (previously MM BIO-6): Amphibian and reptile relocation during dewatering of the portion of lower Piru Creek that will be abandoned, does not address special status bat species because there is a lack of suitable bat habitat in the project area, and potential impacts would therefore be less than significant without mitigation. The EIR has not been revised for impacts to special status bats.

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identify those trees and/or structures proposed for disturbance that could provide hibernacula or nursery colony roosting habitat for bats;

D. Each tree and/or structure identified as potentially supporting an active maternity roost should be closely inspected by the bat specialist no greater than 7 days prior to tree disturbance to more precisely determine the presence or absence of roosting bats;

E. If bats are not detected, but the bat specialist determines that roosting bats may be present at any time of year, it is preferable to push any tree down using heavy machinery rather than felling it with a chainsaw. To ensure the optimum warning for any roosting bats that may still be present, the tree should be pushed lightly two to three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active. The tree should then be pushed to the ground slowly and should remain in place until it is inspected by a bat specialist. Trees that are known to be bat roosts should not be sawed up or mulched immediately. A period of at least 24 hours, and preferably 48 hours, should elapse prior to such operations to allow bats to escape. Bats should be allowed to escape prior to demolition of buildings. This may be accomplished by placing one-way exclusionary devices into areas where bats are entering a building that allow bats to exit but not enter the building;

F. Maternity season lasts from March 1st to September 30th. Trees and/or structures determined to be maternity roosts should be left in place until the end of the maternity season; and,

G. The bat specialist should document all demolition monitoring activities and prepare a summary report to the UCWD upon completion of tree disturbance and/or building demolition activities. Copies of the report should be provided to CDFW.

21. **Mitigation Measure MM-BIO-7 (Fish Relocation During Dewatering of the Portion of Lower Piru Creek to be Abandoned).** The DEIR in MM-BIO-7 describes that “[a] team of qualified biologists shall attempt to remove all native aquatic species from the affected reach at the minimum release flow of 7 cfs utilizing seine nets and/or electrofishing techniques prior to dewatering to prevent potential stranding impacts. After these initial collection activities, releases from Santa Felicia Dam shall be reduced by no more than 1 cfs per hour until a total of 1 cfs is remaining in the affected reach. The team of biologists shall be on-site monitoring the reduction in flows. Once flows in the reach are at 1 cfs, the team of biologists shall once again attempt to remove the remaining native aquatic species from the affected reach within the reduced wetted habitat utilizing seine nets and/or electrofishing techniques. Following these activities, the affected reach would be dewatered and all remaining native aquatic species, if present, would be captured. During the removal activities, all native species shall be relocated to a predetermined location with sufficient habitat features for each species including, but not limited to, instream cover, appropriate dissolved oxygen concentration, and temperature.

CDFW recommends that a conceptual/draft fish salvage and relocation plan be included in the DEIR for review. Plans for fish salvage and relocation should be prepared by persons with expertise in fish survey and salvage techniques and monitoring. Plans should identify the assumptions used to develop the proposed fish surveys, salvage, and monitoring plan and selection of appropriate temporary housing and relocations sites.

Response 6.36

MM BIO-8 (previously MM BIO-7): Fish relocation during dewatering of the portion of lower Piru Creek that will be abandoned, identifies the need for and content of the plan. The Plan will include all elements required by CDFW. The draft plan will be prepared and subject to CDFW review as the final design is completed and prior to Project implementation; the Draft Plan is not attached to the EIR because final engineering design is not yet complete for the proposed Project.

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Each plan should include, at a minimum: (a) the species of fish observed utilizing site-specific stream and reservoir habitat; (b) the selection of appropriate relocation sites based on those species ability to withstand changes in ecological parameters based on temperature, dissolved oxygen, shade, turbidity, and capture activities; (c) a list of actions to implement should it be determined by a monitoring biologist fish bare doing poorly as a result of relocation activities; (e) a description of the methodology utilized to establish the quality of habitat to which fish shall be relocated; (f) measures to control predation of newly relocated fish; (g) specific success criteria to determine relocated fish survival rates.

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In addition, a detailed salvage and relocation plan should be included in the DEIR to avoid potentially significant impacts to the aquatic species identified in Table 5.5-1. The DEIR should identify that all monitors and biologists have current scientific collection permits necessary to handle any wildlife encountered during Project-related activities.

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22. **Mitigation Measure MM-BIO-8 Implement turbidity controls.** The DEIR in MM-BIO-8 identifies that "[r]eleases from the new outlet works shall be increased by no more than 1 cfs per hour until the minimum required habitat water release is achieved. To ensure aquatic species do not enter the new channel as the flows are being ramped-up, a temporary block net shall be placed downstream of its confluence with the lower Piru Creek channel. Turbidity shall be measured in the newly constructed channel as well as downstream in lower Piru Creek during the first 24 hours of the initial releases. When turbidity levels in the new channel do not exceed turbidity levels at the downstream end of the new channel by more than 20 percent, the block net may be removed to allow aquatic species to disperse upstream into the new channel."

CDFW recommends that MM-BIO-8 include biological monitoring of the channel to determine if any aquatic species have successfully navigated the block net and entered the channel. CDFW further recommends a biological monitor survey for any isolated or stranded aquatic species several times a day while the block net is in place. An in-depth relocation plan should also be prepared prior to any dewatering or adjustments in flows to ensure all aquatic wildlife can be successfully removed from harm's way.

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23. **Wildlife Movement.** The CDFW recommends the DEIR analyze the Project's effects on wildlife movement at a regional level. A complete and accurate description of existing wildlife movement on-site and in the vicinity is necessary for an adequate analysis of project-related and cumulative impacts. The DEIR should provide additional analysis of how sediment removal and reservoir management activities could interfere temporarily with the movement of native resident or migratory wildlife species, which may result in a significant impact. In addition, the DEIR should evaluate the potential for long-term significant impacts to wildlife movement between the Santa Monica and Arroyo Simi Mountains from Project implementation.

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Several wildlife accessible conveyances are present in the Project area, along with pedestrian tunnels and an at grade road crossings. These conveyances and surrounding open space provide important wildlife movement opportunities past the dam. Wildlife use of these conveyances and open space provide some of the remaining wildlife crossing opportunities in the region between the Santa Monica and Arroyo Simi Mountains and should be analyzed in the DEIR. These remaining crossings are important for maintaining

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Response 6.37

The following text has been added to MM BIO-8 (previously MM BIO-7): Fish relocation during dewatering of the portion of lower Piru Creek that will be abandoned: "All monitors and biologists shall have current scientific collection permits necessary to handle any wildlife encountered during Project-related activities."

Response 6.38

The following text has been added to MM BIO-8 (previously MM BIO-7): Fish relocation during dewatering of the portion of lower Piru Creek that will be abandoned: "A relocation plan shall be prepared prior to any dewatering or adjustments in flows to ensure all aquatic wildlife can be successfully removed from harm's way."

The following text has been added to MM BIO-9 (previously MM BIO-8): Implement turbidity controls: "A biological monitor shall be present channel to determine if any aquatic species have navigated the block net and entered the channel. The monitor shall survey for any isolated or stranded aquatic species several times a day while the block net is in place."

Response 6.39

The DEIR analyzes potential impacts to wildlife movement (Section 5.5 .4.2, Impact BIO-9), and finds that the impacts are less than significant due to the limited spatial and temporal impacts from construction and lack of current movement corridors through this area. As local wildlife movement impacts are less than significant, regional impacts are not evaluated.

Response 6.40

The DEIR analyzes potential impacts to movement of these species (Section 5.5 .4.2, Impact BIO-9), and finds that the impacts are less than significant due to the limited spatial and temporal impacts from construction and lack of current movement corridors through this area. Sediment removal is not a Project component and therefore is not evaluated in the EIR.

Response 6.41

The DEIR analyzes potential impacts to wildlife movement (Section 5.5.4.2, Impact BIO-9), and finds that the impacts are less than

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genetic flow between isolated populations and associated biological diversity between larger areas of existing core habitat in the area. CDFW recommends the DEIR further analyze off-site wildlife movement from and to the Project through any of the conveyances and permeable open spaces that could provide potential wildlife movement.

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In addition, UWCD should consider project features and/or mitigation measures that include use of tracking stations, camera stations, and telemetry data for the area. Movement studies should be conducted for at least a full year to fully document use of conveyances and open space by wildlife. This type of evaluation would further assist in determining Project impacts to wildlife movement and in developing implementing avoidance and mitigation measures.

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CDFW also recommends that UWCD adopt mitigation measures to avoid using temporary or permanent fencing that could adversely restrict wildlife movement through the Project site to off-site areas. If fencing is determined to be necessary for public safety and/or to direct wildlife to safe passageways through the Project, then it should be constructed with materials that are not harmful to wildlife. Materials to avoid include (but are not limited to) spikes, razor, and barbed wire. All hollow fence posts or fence posts with open top holes, and abandoned pipes should be capped, plugged, or crushed and properly abandoned to prevent the entrapment of avian species and other wildlife.

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24. **Fish Screens.** As part of ongoing efforts associated with the 2008 FERC license and the associated Biological Opinion issued by NMFS on May 5, 2008, UWCD is conducting pre-implementation actions in pursuing a fish passage program for the Santa Felicia Dam. The fish screen requirements have not yet been formally established. However, for feasibility level assessment of proposed intake structure alternatives, UWCD used the following assumptions for design of the fish screens, which are derived from NMFS (1997) and CDFW (2010). UWCD would determine the final details of the fish screen system in later phases of design, following finalization of the criteria required for fish protection and consultation under Section 7 consultation with NMFS. CDFW recommends the following be considered when designing the fish screens.

- A. Fish screens would be required for the design operational flow range (all flow below the maximum design flow of 500 cfs). CDFW recommends that prior to placement of screens, instream flow analyses be completed to determine the appropriate dry season minimum flows required to sustain any fry or smolt confined to lower and upper Piru Creek during the dry season;
- B. Fish screens would not be required for dam safety emergency discharges, but a portion of emergency discharges may be passed through fish screens, if appropriate;
- C. In accordance with NMFS criteria (NMFS 1997) the maximum screen opening should be 0.25 inches, and the effective (open) area of the screen would be equal to or greater than 40 percent of the gross area of the screen;
- D. The maximum approach velocity would be 0.8 feet per second for all flow conditions;
- E. A cleaning system would be required to prevent clogging of screens by suspended debris, and to remove quagga mussels, which are current present in Lake Piru Reservoir, and.

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significant due to the limited spatial and temporal impacts from construction and lack of current movement corridors through this area. While at-grade crossings and pedestrian tunnels are present in the surrounding area, no such features are present within the specific Project site, where construction activity would occur.

Response 6.42

The DEIR analyzes potential impacts to wildlife movement (Section 5.5.4.2, Impact BIO-9), and finds that the impacts are less than significant due to the limited spatial and temporal impacts from construction and lack of current movement corridors through this area. Therefore, mitigation is not required.

Response 6.43

The DEIR analyzes potential impacts to wildlife movement (Section 5.5.4.2, Impact BIO-9), and finds that the impacts are less than significant due to the limited spatial and temporal impacts from construction and lack of current movement corridors through this area.

Response 6.44

Fish screens are described in the Project description in Section 3.1.2.1 and are compliant with the guidance cited in this comment.

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- F. Trash racks would not be required to protect fish screens, given the low approach velocity around the screens.

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We appreciate the opportunity to comment on the DEIR for the Santa Felicia Dam Safety Improvement Project and to assist UWCDC in further minimizing and mitigating proposed impacts to biological resources. If you have questions regarding this letter, please contact Ms. Jamie Jackson at [REDACTED] or by e-mail at [REDACTED].

Sincerely,



Erinn Wilson
Environmental Program Manager I
South Coast Region

REFERENCES

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Ms. Maryam Bral
United Water Conservation District
December 19, 2018
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cc: Randy Rodriguez, CDFW, Los Alamitos
Jamie Jackson, CDFW, Oxnard
Sarah Rains, CDFW, Thousand Oaks
State Clearinghouse, Sacramento

STATE OF CALIFORNIA—CALIFORNIA STATE TRANSPORTATION AGENCY

EDMUND G. BROWN Jr., Governor

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December 18, 2018

Maryam Bral, PE
United Water Conservation District
106 N. 8th Street
Santa Paula, CA 93060

RECEIVED

DEC 21 2018

United Water
Conservation District

RE: Santa Felicia Dam Safety Improvement
Project EIR
SCH # 2017041005
GTS # 07-VEN-2017-00206

Dear Ms. Bral:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above referenced project. United Water Conservation District proposes the conveyance capacity of the existing spillway to sufficiently pass the inflow design flood, which for the Santa Felicia Dam consists of the Probable Maximum Flood of 220,000 cubic feet per second. In addition, UWCD proposes to replace the existing outlet works system due to the potential for failure under seismic loading conditions and impacts associated with sedimentation near the existing intake tower. The proposed project does not include an increase in the capacity of the reservoir nor does it propose any changes to the current flow releases from the dam.

The nearest State facility to the proposed project is SR-126. After reviewing the Draft Environmental Impact Report (DEIR), Caltrans has the following comments:

To evaluate the adequacy of freeway segment operations in the project vicinity, we would like to request a signal phasing and timing study at the intersection of SR-126 and Main St./Torrey Rd. at postmile 28.334. This location represents the main access point to the project, and therefore, should to be adjusted to accommodate the added truck/equipment/vehicle demand, especially during the construction phase.

As a reminder, any transportation of heavy construction equipment and/or materials which requires use of oversized-transport vehicles on State highways will need a Caltrans transportation permit. We recommend large size truck trips be limited to off-peak commute periods.

Also, storm water run-off is a sensitive issue for Los Angeles and Ventura counties. The project needs to be designed to discharge clean run-off water. The completed project should incorporate green design elements that can capture storm water. Incorporating measures such as permeable pavement, landscaping,

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to enhance California's economy and livability"*

**Comment Letter 7Miya Edmonson
California Department of Transportation**

Response 7.1

Thank you for your suggestion. As described in Section 5.17.3.1 and 5.17.3.2, impacts of the Project on transportation and traffic would be less than significant. However, your suggestion will be considered as part of the decision-making process.

Response 7.2

Comment noted. Section 5.17.2.2 states "Caltrans requires a transportation permit for any transport of heavy construction equipment and/or materials that necessitates oversized vehicles on State highways." In addition, the following text has been added to Sections 3.1.5 and 3.2.2, describing the construction activity: "Large-sized truck trips would be scheduled during off peak hours as feasible."

Response 7.3

Comment noted. As evaluated in Section 5.10.3.2, Impact HWQ-5, potential stormwater impacts from construction would be less than significant, and there would be no stormwater impacts from Project operation.

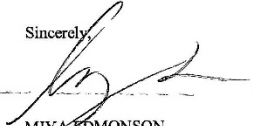
Ms. Bral
December 18, 2018
Page 2 of 2

and trees to reduce urban water run-off should be considered.

| 3

In the spirit of mutual cooperation, Caltrans staff is available to work with your planners and traffic engineers for this project, if needed. If you have any questions, please contact Carlo Ramirez, the project coordinator, at [REDACTED], and refer to GTS #07-VEN-2017-00206.

Sincerely,



MIY A. EDMONSON
IGR/CEQA Branch Chief

cc: Scott Morgan, State Clearinghouse

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