DRAFT ◦ JANUARY 2026

Initial Study/Mitigated Negative Declaration Bouldin Island Multi-Benefit Levee Setback Project



PREPARED FOR

Reclamation District No. 756
(Bouldin Island)
343 East Main Street, Suite 815
Stockton, CA 95202

PREPARED BY

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Cover photo: Existing Bouldin Island levee within the Project Area that will be set back to create a planting bench.

PROJECT SUMMARY

Reclamation District No. 756 Bouldin Island Multi-Benefit Levee Setback Project	
CEQA lead agency name and address	Reclamation District No. 756 343 East Main Street, Suite 715 Stockton, CA 95202
CEQA responsible agencies	• California Department of Water Resources, (funding) • California Department of Fish and Wildlife (Lake and Streambed Alteration Agreement) • Central Valley Regional Water Quality Control Board (Section 401 Permit) • Metropolitan Water District of Southern California (landowner)
Contact person and phone number	Michael Kynett, District Engineer MBK Engineers 455 University Avenue, Suite 100 Sacramento, CA 95825 Office: (916) 456-4400 Fax: (916) 456-0253
Project location	Bouldin Island, Sacramento-San Joaquin Delta, San Joaquin County
Project sponsor's name and address	Russell E. Ryan, Trustee 343 East Main Street, Suite 715 Stockton, CA 95202 Office: (209) 943-5551
Zoning	Agriculture
Description of Project	Levee rehabilitation, waterside bench to create shaded riverine aquatic habitat; crown, slope, and toe berm fill; all-weather roadway; quarry stone armoring topped with soil slurry to fill voids; and pump station relocation.
Surrounding land uses and setting	The Project is on land zoned for agriculture and is adjacent to the Mokelumne River.
Other public agencies whose approval is required	• U.S. Army Corps of Engineers (Section 404 Permit) • Delta Stewardship Council (Consistency Determination)
Have California Native American tribes traditionally and culturally affiliated with the Project Area requested consultation pursuant to Public Resources Code Section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?	The Wilton Rancheria and Lucy Beyhan of the Confederated Villages of Lisjan Nation requested formal consultation pursuant to Public Resources Code Section 21080.3.1. Natural Investigations has forwarded the requests for formal consultation to the District and other agencies, as appropriate. Consultation will be conducted pursuant to Government Code Sections 65351, 65352.3, and 65562.5.

PROPOSED MITIGATED NEGATIVE DECLARATION

Project: Bouldin Island Multi-Benefit Levee Setback Project

Lead Agency: Reclamation District No. 756

Project Location: The proposed Project would be located along the landside and waterside of the western levee (between District Stations 500+00 and 550+00) on Bouldin Island along the Mokelumne River in San Joaquin County. The borrow site is on former agricultural land on the interior of the island. Bouldin Island is situated approximately 6.5 miles southeast of the city of Rio Vista, upstream from the confluence of the Sacramento and San Joaquin rivers in San Joaquin County.

Project Description: Reclamation District No. 756 plans to implement a levee setback on approximately 5,000 linear feet of levee along the Mokelumne River on Bouldin Island to create a waterside planting bench for shaded riverine aquatic habitat, rehabilitate the levee to sustainably meet Bulletin 192-82 standards, and replace the District's Camp 5 Pump Station.

Findings: An Initial Study has been prepared to assess the potential effects of the Project on the environment and the significance of those effects. Based on the Initial Study, Reclamation District No. 756 has determined that the Project, including conservation measures that are part of the Project design, would not have significant effects on the environment. This conclusion is supported by the following findings:

- The Project would have no impacts on the following: mineral resources, noise, population and housing, public services, recreation, transportation, tribal cultural resources, and wildfire;
- The Project would result in less than significant impacts on the following: aesthetics, agriculture and forestry resources, air quality, energy, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, and utilities and service systems
- Mitigation would be included to reduce potentially significant impacts to less than significant levels for: biological resources and cultural resources.

Mandatory Findings of Significance:

- The Project would not substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory.
- The Project would not have environmental effects that are individually limited, but cumulatively considerable.
- The Project would not have environmental effects which would cause substantial adverse effects on human beings, either directly or indirectly.
- The Project would not achieve short-term environmental goals to the disadvantage of long-term environmental goals.
- No substantial evidence exists that the Project would have a negative or adverse effect on the environment.

Proposed Mitigation Measures: Mitigation measures included in the Project to avoid or minimize potential environmental impacts are included in the attached Initial Study, which is hereby incorporated and fully made part of this Mitigated Negative Declaration. Implementation of these mitigation measures would ensure that the potential environmental impacts of the Project are less than significant. Reclamation District No. 756 has agreed to implement each of the identified mitigation measures, which would be adopted as part of the Mitigation Monitoring and Reporting Program.

Determination: In accordance with Section 21082.1 of the California Environmental Quality Act (CEQA), Reclamation District No. 756 has independently reviewed and analyzed the Initial Study and proposed Mitigated Negative Declaration for the Project and finds that the Initial Study and proposed Mitigated Negative Declaration reflects the independent judgment of Reclamation District No. 756. The lead agency further finds that the Project mitigation measures would be implemented as stated in the Initial Study and Mitigated Negative Declaration. This Mitigated Negative Declaration is filed in accordance with CEQA and the State CEQA guidelines.

I hereby approve this Project:

Russell E. [illegible] 01/21/2026

Reclamation District No. 756 Date

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Acronyms and Abbreviation

AB	Assembly Bill
Basin Plan	Water Quality Control Plan for the Central Valley
BMP	best management practices
CARB	California Air Resources Board
CCIC	Central California Information Center
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CGS	California Geological Survey
CHRIS	California Historical Resources Information System
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRHR	California Register of Historic Resources
CRPR	California Rare Plant Rank
CY	cubic yard
dB	decibel
DBH	diameter at breast height
Delta	Sacramento-San Joaquin Delta
District	Reclamation District No. 756
DPS	Distinct Population Segment
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FMMP	Farmland Mapping and Monitoring Program
ft	foot
GHG	greenhouse gas
HTL	high tide line
n	inches
IS/MND	Initial Study/Mitigated Negative Declaration
MBTA	Migratory Bird Treaty Act
MCV	*A Manual of California Vegetation*
MHW	mean high water
MHWL	mean high water line
mi	mile
MLD	Most Likely Descendant
MMTCO2e	million metric tons of carbon dioxide equivalent
NAHC	Native American Heritage Commission
NGVD29	National Geodetic Vertical Datum of 1929
NRHP	National Register of Historic Places
OHWM	Ordinary High Water Mark
Project	Bouldin Island Multi-Benefit Levee Setback Project
pump station	Camp 5 Pump Station
RSP	rock slope protection
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLF	Sacred Lands File
SRA	shaded riverine aquatic
SWPPP	Stormwater Pollution Prevention Plan
TNW	Traditionally Navigable Water
TSS	total suspended solids
USACE	U.S. Army Corps of Engineers

USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VdB	vibration decibels

1 INTRODUCTION

Bouldin Island is owned by the Metropolitan Water District of Southern California, and its levees are maintained by Reclamation District No. 756 (District). The District was formed in October 1904 to protect from flooding and manage drainage of approximately 6,000 acres of agricultural land, local infrastructure and other assets on Bouldin Island through levee maintenance. The District is proposing to construct the Bouldin Island Multi-Benefit Levee Setback Project (Project) along approximately 5,000 linear feet (ft) of levee on the west side of Bouldin Island along the Mokelumne River. The proposed Project would include levee rehabilitation, construction of a waterside bench designed to create shaded riverine aquatic (SRA) habitat through planting and natural recruitment, and replacement of the District's Camp 5 Pump Station (pump station). This Initial Study/Mitigated Negative Declaration (IS/MND) has been prepared in compliance with the California Environmental Quality Act (CEQA) to address the potential environmental effects of the Project. With the implementation of conservation measures included in the Project description, all impacts associated with this Project are anticipated to be less than significant.

1.1 Project Purpose and Need

The proposed Project is within a critically unstable segment of levee. This levee is generally narrow with over-steepened slopes susceptible to erosion, seepage, and slope instability. The Project would increase the protection of infrastructure on Bouldin Island. State Route 12 is one of the main transportation corridors through the Sacramento-San Joaquin Delta (Delta), accommodating approximately 20,000 vehicles per day while functioning as a critical emergency deployment, access, and evacuation route for the Delta and surrounding communities. Bouldin Island has 8.2 miles (mi) of minor roads, 0.3 mi of major roads, 4.6 mi of highway, a gas well, multiple utility corridors, and inhabited residences.

Approximately 5,000 acres on Bouldin Island are typically in agricultural production for crops, including corn, rice, tomatoes, and alfalfa. Much of this agricultural land is seasonally flood irrigated, adding to the available habitat for migratory waterfowl during the fall and winter. In addition to agriculture, the Project's levee protects a variety of other land cover and vegetation types, including riparian, marsh, herbaceous upland, and open water habitats (i.e., canals, ditches, and permanent ponds).

The levee improvements would be multi-benefit and integrate habitat creation and enhancement. The levee would be set back to accommodate a waterside bench that could support a variety of riparian habitats.

1.2 Project Location

The proposed Project would be located along the landside and waterside of the western levee on Bouldin Island, a 5,900-acre island located in the Delta in San Joaquin County (Figure 1-1). Bouldin Island is situated approximately 6.5 mi southeast of the city of Rio Vista, upstream from the confluence of the Sacramento and San Joaquin rivers in Contra Costa County. Bouldin Island is bordered on the north by the South Mokelumne River, on the northwest by Mokelumne River, on the southwest by San Joaquin River, on the east by Little Potato Slough, and on the south by Potato Slough.

1.3 Project Area

The Project Area would be on the west side of Bouldin Island and would include approximately 5,000 linear ft of levee along the left (east, at this location) riverbank of the Mokelumne River, between Stations 500+00 and 550+00 (Figure 1-1). The Project Area additionally includes the District's pump station, located at Station 525+00 (38.102030°, -121.559945°) near the existing landside toe and situated approximately 110 ft east of the existing levee centerline, the borrow site shown in Figure 1-1, and the pump station relocation footprint, including the interior ditch re-alignments. The Project Area extends to the shoreline of the Mokelumne River, but except for the removal of four existing pump station outfall pipes and construction of four new pipes and their support structure, all work would be conducted entirely above mean high water line (MHWL). Access to the Project Area would be from Highway 12 to private roads within Bouldin Island.

1.4 Project Description

The proposed Project would include rehabilitating 5,000 linear ft of levee from Stations 500+00 to 550+00 by setting back the levee, constructing a waterside bench habitat bench that would be planted with native species to create SRA habitat, and replacing the District's pump station. The District's long-term goal is to meet the Bulletin 192-82 levee standard[1] by sustainably rehabilitating the levee system (State of California et al. 1982).

1.4.1 Project Background

The levee within the Project Area has a history of recurring, substantial damage during past flood events. This historical poor past performance caused the California Department of Water Resources (DWR) to partner with the District to fund levee remediation and habitat enhancement. During the 2023 flood, additional damage occurred when the landside levee slope settled and boils were observed, jeopardizing the integrity of the levee. Immediately following the 2023 flood event, the District declared a local emergency and began the emergency stabilization of the levee through construction of a berm along the existing landside levee slope and toe. Due to the poor soil conditions within the levee embankment and foundation, fill thicknesses of only 3 to 5 ft could be achieved without failing (i.e., cracking, excessive settlement, uplift, and/or additional seepage) of the foundation soils. Consequently, the emergency levee stabilization had to be performed in stages, where the fill thicknesses were limited and spaced out over several months, otherwise additional levee damage would occur. In total, the emergency work consisted of the placement of approximately 244,497 cubic yards (CY) of onsite fill material and was completed by fall 2024. The District performed this work under an emergency declaration with exemption for CEQA compliance.

Because the Project would require setting back the levee, any infrastructure currently existing within the levee footprint would need to be modified or relocated. The pump station located near Station 525+00 is currently in the setback levee footprint. The Project would include replacing and relocating the pump station (which was installed before the 1950s) and the sump (water collection area for the pumps) to update the equipment. The pump station is one of two pump

[1] Bulletin 192-82, published by DWR in December 1982, specifies the following levee minimum standards: (1) 1.5 ft of freeboard above the 300-year flood frequency elevation, as defined by the U.S. Army Corps of Engineers (USACE); (2) a minimum crown width of at least 16 ft; (3) waterside slopes of at least 2 horizontal to 1 vertical with revetment in areas where erosion has been a problem; (4) landside slopes of at least 3 horizontal to 1 vertical, with flatter slopes in lower portions where soil stability and seepage have been problems; and (5) crowns with all-weather access roads.

stations on Bouldin Island responsible for interior drainage of the island. Pumped drainage of the island is needed due to elevations below sea level and a natural water table near the ground surface, seepage (movement of water from the river, under and through the levee, to the landside), rainfall runoff, and irrigation. Moving the existing pump station and extending the associated piping would accommodate rehabilitation of the levee toe berm. The four existing discharge pipes are welded steel-pipe with their outlets are normally submerged. There are three functional pumps, and one pump was decommissioned and removed. The pumps are situated on a steel-framed enclosed structure with a trash rack in the sump. The existing pump station, pumps, and associated appurtenances have exceeded their operational lifespan and are no longer reliable.

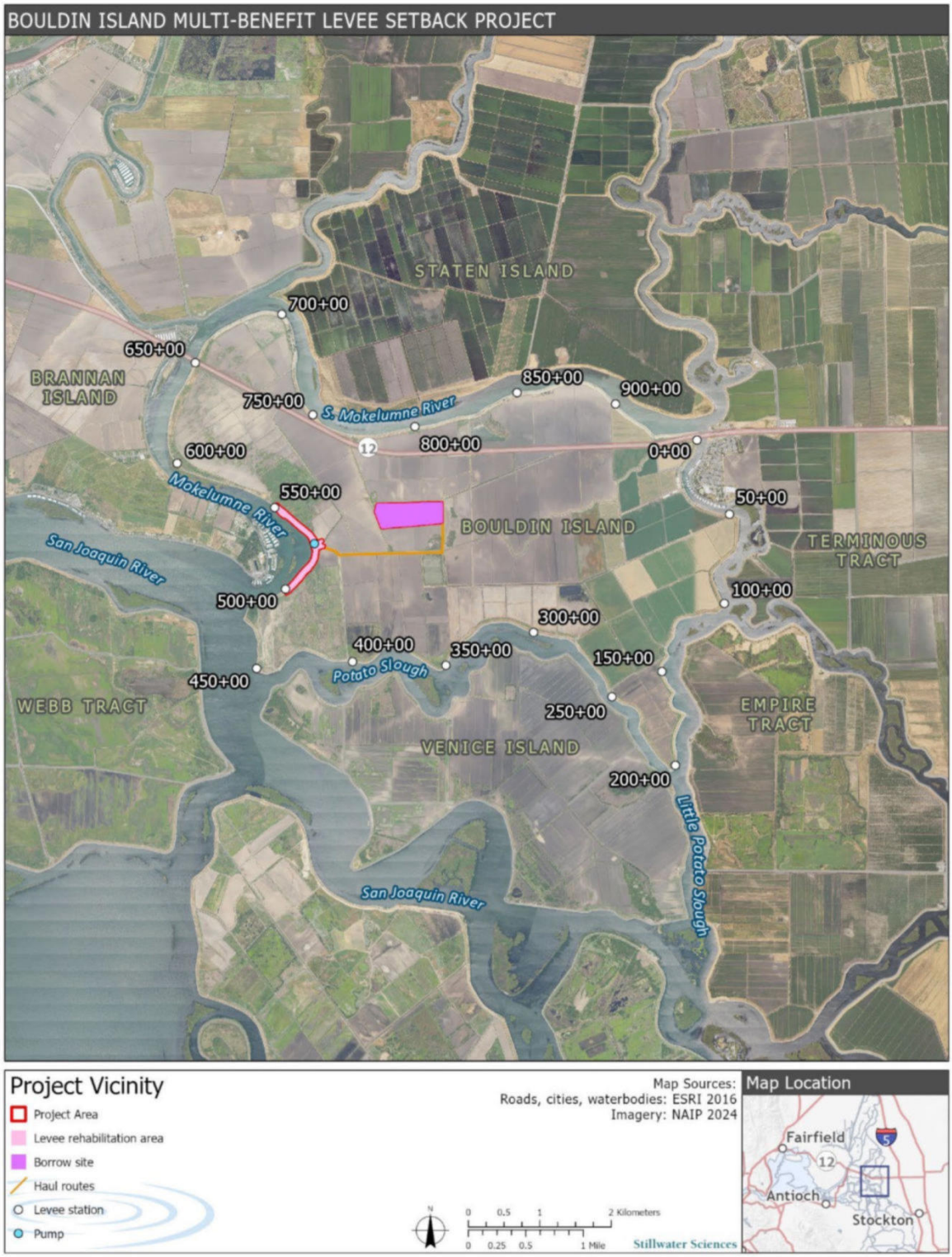

Figure 1-1. Project vicinity and features.

1.4.2 Construction

The proposed Project would consist of levee rehabilitation and pump station relocation. The levee rehabilitation scope would include placement of approximately 80,000 CY of onsite and imported fill between Stations 500+00 and 550+00 for setback levee construction to accommodate a waterside bench that could support a variety of habitats (Figure 1-2). The new setback levee would be widened and raised with a 3H:1V landside slope to meet the Bulletin 192-82 criteria (State of California et al. 1982). The 20-ft-wide waterside bench would be constructed within the existing levee footprint and would extend for the length of the waterside levee within the Project Area except for an approximately 300 ft section (between Stations 524+00 to 527+00) to accommodate the removal and construction of the pump station and outfall pipes. This bench would be created by stripping existing aggregate base from the levee crest and degrading to a minimum elevation of 5.43 ft National Geodetic Vertical Datum of 1929 (NGVD29). The degraded levee fill material may be temporarily stockpiled onsite for reuse as setback levee fill. The setback levee would be constructed using a mixture of onsite borrow fill, stockpiled fill from the levee degrade, and imported fill material. A shallow exploratory trench would be excavated along the setback levee alignment and backfilled with imported low-permeability clay to reduce seepage risk. Approximately 18,000 tons of clean quarry stone would be placed over existing rock slope protection (RSP) on the waterside slope and then covered with soil to promote vegetation establishment. The new RSP would be placed above the existing rock and above MHWL. The setback levee crown would be completed with approximately 4,000 tons of imported aggregate base that would be compacted for the levee crest access roadway. The landside slopes and other disturbed areas would be revegetated using a native grass seed mixture suitable for levee embankments.

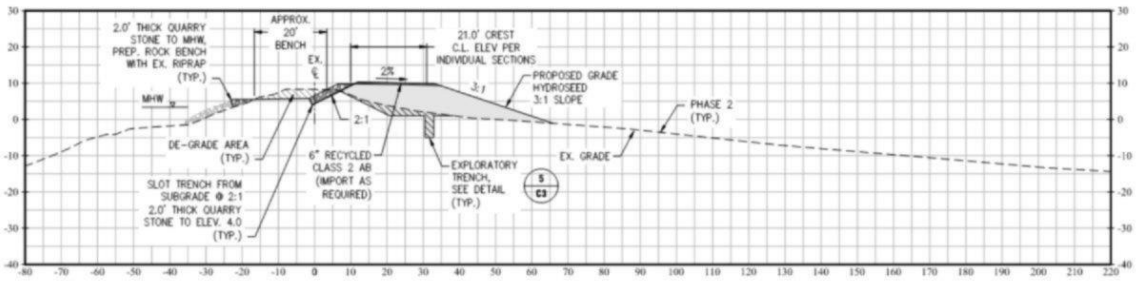

Figure 1-2. Typical levee cross section for the Project.

1.4.2.1 Setback levee and waterside bench construction

Site preparation activities include clearing vegetation on the existing landside slope, most of which is non-native ruderal herbaceous (weedy) vegetation. Following construction, these areas would be re-seeded with native grasses, allowing vegetative cover to re-establish in these areas. Very little vegetation on the waterside slope would require removal, and as feasible, all trees or shrubs on the waterside with a diameter at breast height (DBH) greater than four inches (in) would be protected in place. Existing aggregate base on the levee crown would be stripped and temporarily stockpiled onsite and reused in project fills.

Existing siphons, pipes, and other infrastructure would be raised above the design flood elevation to facilitate levee rehabilitation.

The setback levee would be constructed by placing and compacting a mixture of onsite and imported fill immediately adjacent to the existing levee. Fill for the levee crest would be placed in two phases, with a minimum 3-month waiting period between stages, to allow consolidation of marsh soils and reduce the risk of ground movement. Embankment fill would be compacted using heavy compaction equipment, bulldozers, and excavators. The existing levee crown would be degraded to an approximate elevation of 5.43 ft NGVD29. The approximately 20-ft-wide waterside bench would be constructed within the remnant footprint of the old levee. The degraded levee material and aggregate base roadway material would be temporarily stockpiled onsite for future reuse during construction. New rock slope protection would be placed above the existing rock and MHWL.

The access road along the crest of the setback levee would be constructed with approximately 4,000 tons of imported aggregate base. The waterside levee slope would be armored with approximately 18,000 tons of clean quarry stone. The newly constructed landside setback levee slope would be track walked with construction equipment prior to being revegetated with native grasses. Seeding and/or planting would occur in October or November, prior to the onset of winter rains, so no irrigation would be required.

Stockpiling of construction materials, including portable equipment, vehicles and supplies, and any hazardous materials, would be restricted to the staging areas described in Section 1.4.3 below.

1.4.2.2 Pump station relocation and construction

The District's existing main pump station and drainage ditch are located at the existing landside levee toe, approximately 110 ft from the levee centerline. As part of the Project, the pump station would be relocated farther landward and downstream of its current location; the new location would be outside the rehabilitated levee cross section. Moving the existing pump station and extending the associated piping would also help accommodate the setback levee configuration. The new pump station sump would be relocated within the existing drainage ditch, so no new ditch would be constructed but the existing ditch would need to be realigned to convey drainage to the new sump area. The aging pump station would be replaced with new pumps and associated pipes as part of a newer, more efficient pump system. The old pump station (footprint of approximately 1,250 sq. ft, with four 30 in diameter pipes) would remain in place until construction of the new pump station (footprint of approximately 1,100 sq. ft with four 20 in diameter pipes,) is complete, then the old pump station would be demolished, the associated pipe outfalls would be removed from the Mokelumne River, and all materials would be disposed of off-site at approved facilities. The old pump station sump would be backfilled as part of the levee rehabilitation.

Construction for the new pump station would begin with site mobilization and preparation. Sheet piles and pile foundation elements (typically pipe piles) would be installed for the new sump walls and pump station structure foundations. The new sump area would be enclosed by sheet piles on three sides. Sheet piles may be installed as temporary coffer dams to isolate the new sump area and facilitate construction of the cast-in-place concrete or pre-cast concrete sump foundation. Sheet piles and foundation (pipe) piles may be installed using vibratory or impact hammers, temporary coffer dam sheet piles would be removed after construction using a vibratory hammer. The need for coffer dams and dewatering is dependent on the contractor's means and methods and may or may not be utilized.

Following installation of pile systems, the new pump station sump would be excavated, requiring excavation of approximately 300 CY of material within the drainage ditch. The sump bottom would be installed with either cast-in-place concrete or pre-cast articulating concrete block mats. The metal framed pump deck would be constructed and pumps and motors installed. A pre-fabricated metal or concrete masonry unit building would be installed after the deck is completed. All electrical equipment would be located on the upper deck.

If coffer dams are installed and the sump area or ditches are dewatered, the dewatering would be performed using portable submersible generator powered electrical pumps. Water pumped from dewatered areas would be discharged into the surrounding fields or back into the District's drainage ditches that act as long line settling basins prior to being pumped through the existing pump station.

Because of the seepage forces causing uplift and high groundwater, complete dewatering of the ditch or sump area bottoms prior to backfill may not be possible and could adversely impact levee performance. Therefore, the main drainage ditch could be backfilled in partially wet subgrade conditions.

The drainage ditches would be realigned and backfilled to the surrounding grade as necessary, at elevation -22 ft NGVD29. Onsite fill material would be used as backfill.

The pipes for the new pump station would discharge directly into the Mokelumne River (as the current pipes do) approximately 300 ft downriver from the current outfall pipe locations (in line with the relocated pump station). Four new 20 in. diameter steel pipes approximately 250 to 300 ft in length would be installed between the Mokelumne River and the relocated pump station. These pipes would extend up and over the levee with at least two ft minimum soil cover. The pipes would be supported on shallow foundations with flexible couplings to provide for differential settlement. The pipe support structure on the waterside of the levee would be located below MHWL in the Mokelumne River, requiring in-water installation (pile driving) of three 12 in diameter pipe piles. Approximately 30 CY of additional RSP would be placed below MHWL underneath the pipe outfalls to prevent erosion.

1.4.3 Staging area

The primary Project staging area would be located within the borrow site boundary on Bouldin Island (Figure 1-1), with additional staging areas located adjacent to the new pump station or elsewhere within the project boundary.

1.4.4 Materials and quantities

1.4.4.1 Onsite fill

The Project setback levee and pump station relocation would require an estimated 27,500 CY of fill obtained from the borrow site located on Bouldin Island.

1.4.4.2 Imported fill

Approximately 4,000 tons of Class 2 aggregate base would be used to construct the levee crown road, and 18,000 tons of clean quarry stone would be used to armor the upper waterside slope. Approximately 52,500 CY of imported fill material would be used to construct the setback levee prism. Imported materials would be sourced from the surrounding areas (e.g., Ione, Stockton), as

determined should the Project be approved. Imported fill would consist of low-permeability clay, as on-site borrow is primarily sand and not suitable for seepage control.

1.4.4.3 Peat stripping

Approximately 13,500 CY of peat would be removed from the borrow site and placed in designated onsite peat stockpile areas, located within the southwestern portion of the borrow site footprint (Figure 1-1).

1.4.5 Equipment

Table 1-1 provides a list of equipment that would be used for Project construction.

Table 1-1. Equipment List for the Project.

Equipment type	Number of rigs (or loads, if specified)
Excavators	2–3
Bulldozers	2
Blades	2
Compactors	2
Water trucks	2–3
Skip loader	1
Crew pickups	4
Semi-bottom dump trucks, onsite fill	10–30 looping trucks 3,500 total truck trips
Semi-bottom dump trucks, imported fill and aggregate	50–150 loads per day 4,600 total truck trips
Side dump trucks, imported quarry stone	~50 loads per day 1,000 total truck trips
Pumps (water truck)	2
Pumps (borrow site and sump)	2
Planting equipment	To be determined
Crane	1
Emergency and diesel generator	2
Tool truck	1

Construction equipment and imported materials (e.g., fill) would be transported to Bouldin Island via trucks. Semi-bottom dump trucks would haul fill and aggregate base from off-island to the setback levee. Equipment to place and compact fill material would likely include excavators, blades, bulldozers, water trucks, and compactors. Semi-bottom dump trucks would remain onsite and deliver fill from the borrow site to the setback levee in a looping pattern. Haul routes would be restricted to existing roads. A crane, excavators, and haul trucks would be used to install the sheet piles and coffer dam (if needed), and to excavate the new pump station location. Diesel generators and dewatering pumps would be used to dewater the area behind the cofferdam once the new pump station is operational. A tool truck and water truck would be used throughout the construction process.

Pumps would run as needed at the borrow site to control water levels or to fill water trucks. Water trucks would spray water to control dust throughout Project construction. Construction equipment would operate from the levee crown or on the landside slope, starting with the initial lift of the toe

berm and working up toward the levee crown to construct the phased improvements. Fill thickness markers would be installed and monitored to control fill placement, and inclinometers would be used to monitor lateral movement and settlement.

Semi-bottom dump trucks with a 12-CY load capacity would be used to haul onsite and spoil material. Import trucks with an approximately 18-ton load capacity would be used to haul imported material. Onsite material would be transported in approximately 3,500 truck trips. Imported material would be transported in approximately 5,600 truck trips.

1.4.6 Schedule

Primary Project construction activities are expected to occur over two years in six-month periods, between May 1 and November 1, with waterside work only occurring between July 1 and November 1, and in-water work in the Mokelumne River only occurring between August 1 and October 31. Within this window, an estimated 180 working days would be necessary to complete the Project. Work is expected to occur Monday through Saturday, with light work (e.g., equipment maintenance) on Sundays if needed. A typical workday is assumed to be 8 hours per day, during daylight hours. Construction work would not occur prior to 6:00 a.m. or after 6:00 p.m.

1.4.7 Conservation measures

The following conservation measures would be implemented as part of the Project. The measures are based on standard practices to avoid, minimize, or reduce potential impacts to environmental resources and to comply with existing regulations and/or requirements pertaining to air quality, biological resources, cultural resources, energy, greenhouse gas (GHG) emissions, hazards/hazardous materials, and hydrology/water quality.

CM-1. The following best management practices (BMPs) would be implemented during Project construction to prevent, control, and minimize emissions:

a) All construction vehicles would be model year 2010 or newer.
b) All diesel-fueled construction equipment would be in compliance with the California Air Resources Board's In-Use Off-Road Diesel-Fueled Fleets Regulation.
c) All construction equipment would be properly tuned and maintained prior to and for the duration of onsite operation.
d) Diesel-powered construction equipment idling time would be minimized to the extent feasible.
e) An operational water truck would be available at all times. Water would be applied as needed to control dust and to prevent visible emissions violations and offsite dust impacts.
f) Traffic speeds on all unpaved surfaces would be limited to 20 mi per hour or less.
g) Ground cover would be re-established within the Project Area as soon as possible after construction.

CM-2. Prior to Project construction, a Stormwater Pollution Prevention Plan (SWPPP) would be developed. The SWPPP would be kept on site during construction activity and would be accessible during operation of the Project. The SWPPP would include, but not be limited to, the following elements to avoid and minimize potential impacts to water quality in surrounding waterways from erosion:

a) Requirements regarding work limits and erosion control measures during and surrounding major precipitation events.
b) Measures to protect the site from washout or erosion prior to the onset of the rainy season.
c) Procedures to restore temporarily affected areas to pre-construction contours and conditions upon completion of construction activities, and to re-seed any areas of bare ground with a native seed mix.
d) Requirements regarding the proper storage of soil, silt, and earthen materials, and implementation of erosion control measures throughout all phases of operation where silt and/or earthen fill have the potential to enter Waters of the United States and/or State.

CM-3. The SWPPP would additionally include, but not be limited to, the following elements to avoid and minimize potential impacts from hazards and hazardous materials:

a) Requirements to store hazardous materials with the original manufacturer's label and in accordance with local, state, and federal regulations.
b) Procedures for storage of hazardous materials in locations and manners that minimize their potential to enter a waterway and/or contaminate aquatic resources.
c) Methods regarding use and disposal of potentially hazardous materials stored on site.
d) Procedures for on-site storage of machinery with the potential to leak hazardous materials.

CM-4. The SWPPP would additionally include, but not be limited to, the following elements to prevent, control, and minimize impacts from a spill of a hazardous, toxic, or petroleum substance during construction of the Project:

a) Methods for handling and storing vehicles, equipment, diesel fuel, oil, gasoline, lubricants and other petroleum products to minimize potential spills and effects to storm water.
b) Procedures for containment, clean-up and reporting of any minor spills.
c) Requirements for reporting major spills to the proper emergency response agencies to avoid fines and penalties.
d) Additional specific spill control, clean-up and reporting requirements including on-site storage of spill response materials and training in spill response for all on-site personnel.

CM-5. The following measures would be implemented to reduce the potential for fire:

a) Smoking would be permitted only in designated smoking areas.
b) Every fuel truck would carry a large fire extinguisher with a minimum rating of 40 B:C.
c) All flammable materials would be removed from equipment parking and storage areas.

CM-6. In the event of an inadvertent discovery of human remains the provisions of the California Health and Safety Code Section 7050.5, PRC Section 5097.98, and Assembly Bill 2641[2] shall be implemented. In addition, all work within 25 feet of the discovery shall immediately cease until

[2] Assembly Bill 2641 amended Public Resources Code §§ 5097.91 and 5097.98 to strengthen protections for Native American human remains. The bill extends the decision window for the Most Likely Descendant (MLD) from 24 hours to 48 hours, allowing more time for culturally appropriate recommendations about treatment or disposition of Native American human remains; requires landowners to protect the immediate area of discovered remains from disturbance until consultation with the MLD is complete; allows extended consultation between the landowner and descendants when multiple sets of human remains are found; and requires landowners to protect reinterment locations from future disturbance.

the discovery can be evaluated by the County Coroner. Project work may continue at other project locations while the discovery is examined. If the remains are determined to be Native American, the County Coroner must contact the Native American Heritage Commission (NAHC) who would identify a Most Likely Descendant (MLD) for the remains. The MLD would make recommendations for the recovery, treatment, and disposition of any Native American remains. Final disposition of any inadvertently discovered human remains would be decided in consultation with the MLD, the District, and any other appropriate regulatory agencies.

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1.4.8 Mitigation measures

Mitigation measures have been added to the Project to reduce potential impacts to biological and cultural resources and water quality to a less-than-significant level.

MM-1. To the extent feasible, trees and shrubs with a DBH exceeding 4 in on the waterside of the levee would be protected in place during vegetation removal activities.

MM-2. A qualified biologist with appropriate knowledge and experience in the biology, life history, and identification of fish, wildlife, and plants that are likely to be encountered during proposed Project activities would conduct pre-construction biological surveys to identify special-status plants, wildlife, and sensitive natural communities before construction commences each season. Based on the survey results, the biologist would establish appropriate avoidance buffers for sensitive resources. For special-status plants, any populations identified would be flagged for avoidance with a minimum 10-ft-radius buffer. If work must occur within this 10-ft buffer, hand tools would be used to the extent possible. The qualified biologist would be present at appropriate intervals prior to and during construction activities that have the potential to adversely affect sensitive resources (e.g., during in-water work in the Mokelumne River or work within established buffers). The biologist would have the authority to halt any work that is deemed to be a cause for concern or that may endanger special-status plants, wildlife, or fisheries resources.

MM-3. All contractors and equipment operators would be provided with Worker Environmental Awareness Program training about the environmental resources of the Project Area, including special-status fish, wildlife, and plant species (as defined in Section 2.4.1.1) with potential to occur within the Project Area, and about required protection measures. Workers would be informed about the presence, life history, and habitat requirements of all special-status species that may be affected by Project activities. Training would also include information on state and federal laws protecting fish, wildlife, plants, nesting birds, cultural resources, and water quality and the consequences of noncompliance with these laws. This training would be conducted prior to construction activities or to adding any new staff/contractors during the Project.

MM-4. A preconstruction survey for northwestern pond turtles (*Actinemys marmorata*) and active breeding locations (i.e., nests), as relevant, would be conducted in all suitable habitat within, and up to 300 ft surrounding, the Project Area. These surveys would be conducted no earlier than 7 days prior to initiation of construction activities each season. If an active northwestern pond turtle nest (nesting season is typically May through July) is discovered, the area would be noted, and a no-disturbance buffer would be established and flagged. The recommended no-disturbance buffer is 100 ft; however, the buffer would be determined by the

qualified biologist (and if needed, in consultation with relevant agencies) based on environmental conditions and activities being conducted nearby. No Project activities would occur within the no-disturbance buffer zone until the biologist has determined that the nest is no longer in use. If deemed appropriate by the biologist, exclusion fencing may be incorporated. If a northwestern pond turtle is observed at any time during construction, it would be allowed to leave the area on its own or may be relocated by a qualified biologist to suitable habitat outside the Project footprint.

MM-5. The following measures would be implemented to minimize potential impacts to giant garter snake (*Thamnophis gigas*) or its habitat. These measures are based on the U.S. Fish and Wildlife Service's (USFWS's) *Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat, from Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California* (USFWS 1997), as well as recommendations from CDFW.

a) Site preparation and initial ground-disturbing activities within 200 ft of suitable giant garter snake habitat would occur between May 1 and October 1 (the snake's active period), lessening the potential for direct mortality during brumation. Ground-disturbing work initiated prior to October 1 may continue into the snake's inactive season.
b) All Project Areas would be surveyed for giant garter snake by a qualified biologist within 48 hours prior to the start of construction activities, and again if there is a lapse in activity of two weeks or more.
c) If a giant garter snake is discovered at any time within the Project Area, all Project activities would halt until USFWS and CDFW have been notified and given the opportunity to provide additional giant garter snake protection measures.
d) Project related vehicles would observe a 20 mi per hour speed limit and drivers would be informed to watch for snakes during construction and access to the Project Area.
e) The use of erosion control materials potentially harmful to giant garter snake, such as mono-filament netting, would be prohibited. Tightly woven fiber netting or similar material would be used instead to ensure that giant garter snakes do not get trapped or become entangled.

MM-6. To the extent practicable, construction would take place outside the typical bird nesting season (February 15 to August 31). If construction is conducted during the nesting season, a biologist would conduct a focused pre-construction nesting bird survey within the Project Area no earlier than 1 week prior to the initiation of Project activities. The survey would be conducted in all potential nesting habitat within the Project Area and within a 250-ft or 1,000-ft buffer for passerines and raptors, respectively. If construction activities lapse for 7 days or more during the nesting season, a biologist would conduct an additional nesting bird survey in areas of potential habitat before Project activities are reinitiated. If an active nest is identified, a no-disturbance buffer would be established using flagging, fencing, and/or signage as appropriate. No construction activities would occur within the buffer zone until a qualified biologist has determined that the young have fledged or that construction activities within the buffer zone are not disturbing the birds. The width of the buffer zone and whether activities are permitted within it would be determined by a qualified biologist.

MM-7. The following measures would be implemented for Project activities conducted between March 1 and August 15 to minimize potential impacts to Swainson's hawk (*Buteo swainsoni*):

a) Survey timing and methodologies would aim to follow the Swainson's Hawk Technical Advisory Committee's (2000) *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* within 0.25 mi of the Project Area up to construction start date.
b) As feasible, initial surveys would be conducted during the early months of the nesting season (March 20 to April 5) to maximize the likelihood of detecting any active nest.
c) If active nests are found, a biologist would establish an initial 0.25-mi no-disturbance buffer around the nest. If Project-related activities need to occur within the no-disturbance buffer, a biological monitor experienced with raptor behavior would monitor the nest during work. The biological monitor would have the authority to stop work if nesting hawks are exhibiting agitated behavior. If the birds appear tolerant of Project activities, the qualified biologist may consider reducing the no-disturbance buffer.

MM-8. Western burrowing owl (*Athene cunicularia hypugaea*) could be present within or near the work area. No earlier than 14 days prior to the start of construction, a biologist would conduct a preconstruction survey for active burrowing owl burrows using methods recommended in CDFW's *Staff Report on Burrowing Owl Mitigation* (CDFW 2012). Occupied habitat includes areas burrowing owls may use for breeding (February 1 to August 31), wintering (September 1 to January 31), foraging, and migration stopovers. Occupancy of suitable burrowing owl habitat can typically be verified by an observation of at least one burrowing owl or, alternatively, its molted feathers, cast pellets, prey remains, eggshell fragments, excrement, or loose soil near the burrow entrance. If burrowing owl presence is demonstrated, an appropriate buffer of up to 1,600 ft (as recommended in the *Staff Report on Burrowing Owl Mitigation*) would be established by a biologist around any occupied burrows. Project-related activities that must be conducted within the buffer would be monitored by a qualified biologist to ensure that Project construction does not detrimentally impact the owls. The onsite biologist would have the authority to stop work if the owls are exhibiting agitated behavior. If the birds appear tolerant of Project activities, the qualified biologist may consider reducing the no-disturbance buffer.

MM-9. All in-water work in the Mokelumne River would be limited to August 1 through October 31, a timeframe when special-status fish are least likely to be present in the Project Area.

MM-10. During all in-water work in the Mokelumne River, construction equipment would be operated from an upland berm/levee. Prior to pile-driving, RSP placement below MHWL, or any other in-water work equipment operators would employ measures to minimize impacts to fish such as agitating water with excavator buckets before placing material, and/or using bubble curtains or coffer dams around pile driving as feasible.

MM-11. The duration of in-water work would not exceed the minimum amount required. The quantity and spatial extent of RSP material placed beneath the replacement pipe outfalls in the Mokelumne River would not exceed the minimum amount required and would be placed on top of existing RSP material.

MM-12.
In the event of an inadvertent discovery of cultural resources, proposed project activity shall immediately cease within 25 feet of the discovery. Project work may continue at other locations while the discovery is examined. The District shall retain a professionally qualified archaeologist (i.e., an archaeologist that meets the *Secretary of Interior's Qualifications Standard*s at 36 CFR

Part 61[3]) to determine the potential significance of the discovery. If it is determined that the discovery is not significant no further investigations are necessary, and project activity may resume. If the discovery is determined to be significant, additional investigations (e.g., data recovery excavations) may be necessary before resuming project activities at the site of the discovery. Any additional archaeological investigations would be designed and conducted in consultation with the District, a professionally qualified archaeologist, appropriate Native American tribes, and other regulatory agencies, as appropriate. Regardless of the significance of an inadvertent discovery, all inadvertent discoveries of cultural resources shall be appropriately documented and reburied in a location where the cultural resources would not be disturbed in the future.

[3]The Secretary of Interior's Qualifications Standards (i.e., 36 CFR Part 61) set minimum academic and experience criteria for professionals working on historic preservation projects. The minimum professional qualifications in archeology are a graduate degree in archeology, anthropology, or closely related field plus: (1) At least one year of full-time professional experience or equivalent specialized training in archeological research, administration, or management; (2) At least four months of supervised field and analytic experience in general North American archeology, and (3) Demonstrated ability to carry research to completion.

2 ENVIRONMENTAL SETTING AND IMPACTS

Each of the following resource sections includes a completed checklist (from Appendix G of the CEQA Guidelines) of environmental factors potentially affected and identifies potential Project impacts by significance level (i.e., no impact, less than significant impact, less than significant impact with mitigation incorporated, and potentially significant impact). The environmental factors checked in Table 2-1 would potentially be affected by this Project; mitigation measures would be implemented to ensure potential impacts are reduced to less than significant levels.

Table 2-1. Environmental factors potentially affected by the Project.

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

2.1 Aesthetics

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Except as provided in Public Resources Code Section 21099, would the Project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	✓
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	✓
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the Project is in an urbanized area, would the Project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	✓	☐

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	✓

2.1.1 Environmental setting

The term *aesthetics* typically refers to the perceived visual character of an area, including scenic views, open spaces, or architectural facades. Aesthetics is the study of perceptual experiences that are pleasing to people, while visual quality describes the experience of having pleasing visual perceptions (FHWA 2015). The aesthetic value of an area is a measure of its visual character and visual quality combined with viewer response (SJCOG 2018). Various components of a construction project, such as buildings constructed at heights that obstruct views, hillsides cut and graded, or open spaces converted to urban settings, may affect the Project Area's aesthetic value. Additionally, the duration and frequency of viewer exposure influence aesthetic perception. Aesthetic impacts occur when viewer responses change as a result of Project construction and operation.

The Project's levee provides scenic views of the Delta, including the South Mokelumne River, Mokelumne River, Potato Slough, and Little Potato Slough. Views of the interior of the island are largely agricultural and include ruderal vegetation, managed agricultural fields, and small patches of riparian forest and marshland. While vehicles can access Bouldin Island using State Route 12, the levee road within the Project Area is typically secured by locked gates at several access points, and views of the Mokelumne River are blocked to vehicular traffic by the existing levee. The levee road is only used to access agricultural fields, the few residences on the island, and the general area for levee inspection and maintenance.

People boating in waterways surrounding the island are not generally able to see the interior part of the island because of the existing levee. Potential viewers include the people inhabiting the few residences on the island, District employees who are responsible for patrolling and maintaining the island, and farmers who manage the agricultural fields on the island.

2.1.2 Findings

a) Would the Project have a substantial adverse effect on a scenic vista?

Levee rehabilitation associated with the Project would not alter the scenic views of the South Mokelumne River, Mokelumne River, Potato Slough or Little Potato Slough from Bouldin Island. Views of the island interior are not scenic, as previously described. Consequently, the Project would have no impact to the scenic vista.

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

State Route 12 is not a state scenic highway. Consequently, the Project would have no impact to scenic resources within a state scenic highway.

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

The Project is located in a non-urbanized area. Construction activities would temporarily alter the visual character of the Project Area. During construction, limited vegetation on the waterside slope would be removed. Excavation at the borrow site would temporarily impact visual quality because construction equipment may be visible to boaters on the South Mokelumne River, Mokelumne River, or Little Potato Slough; motorists on State Route 12; and occasional island visitors. These temporary impacts would occur over approximately 12 months, spanning two six-month periods (May to November) over two years. Upon Project completion, all equipment would be removed, the landside levee slope would be revegetated with a native grass mix, and clean quarry stone would be placed on the waterside slope and covered with soil to promote vegetation growth. The levee improvements would also integrate habitat creation and enhancement through the implementation of a waterside bench at the setback levee. The waterside bench would be covered with soil and planted with native seeds to promote vegetation establishment, which would add to the aesthetic value of the area. Additionally, the borrow site is anticipated to passively establish freshwater pond, marsh, and/or scrub-shrub habitat, which would add heterogeneity to the landscape. For these reasons, the rehabilitation of the levee would not permanently degrade the visual character or aesthetic quality of the Project Area or surrounding areas. Project impacts to public views of the site and its surroundings would be less than significant.

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

The Project would not entail nighttime construction or the creation of a new source of substantial light or glare. The Project would have no impact on day or nighttime views.

2.2 Agriculture and Forestry Resources

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

2.2.1 Environmental setting

Bouldin Island, located in the San Joaquin Valley near the South Mokelumne River, Mokelumne River, Potato Slough, and Little Potato Slough, has developed deep, productive agricultural soils over time. The region's long growing season supports extensive farming, with San Joaquin County containing approximately 920,000 acres of fertile land used for fruit and nut crops, field crops, livestock, and poultry (San Joaquin County 2016). Bouldin Island has about 5,000 acres of

leased agricultural fields, typically used for corn, alfalfa, and sunflower (SWSD 2021). The land-use designation for Bouldin Island under the San Joaquin County General Plan is General Agriculture (AG-40) and is not included in a Williamson Act contract (City of Manteca 2024).

2.2.1.1 Farmland

The California Farmland Mapping and Monitoring Program (FMMP), administered by the State Division of Land Resource Protection, is responsible for producing agricultural resource maps based on soil quality and land use. The purpose of the FMMP is to provide information to be used for planning the current and future use of the state's agricultural lands. The FMMP designates land into the following categories: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, Grazing Land, Urban or Built-up Land, Other Land, and Water. Descriptions of these categories are detailed in the FMMP (California DOC 2025a).

Most of Bouldin Island is designated as Prime Farmland (5,359 acres) (CFMMP 2022). An additional 29 acres in the interior of the island are designated as Farmland of Statewide Importance, and 273 acres along the western edge of the island are designated as Farmland of Local Importance. The Project Area includes 79.9 acres of Prime Farmland, 29.0 acres of Farmland of Local Importance, and 1.6 acres of Farmland of Statewide Importance.

2.2.2 Findings

a) Would the Project 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?

Although the FMMP classifies much of the construction footprint as Farmland, this area is primarily composed of levees that protect the adjacent agricultural fields. The levees are not in agricultural production and would be restored to their current use following Project construction. No existing agricultural land would be lost within the setback levee and expanded levee footprint. The borrow site, which includes approximately 72 acres of Prime Farmland and 1.4 acres of Farmland of Statewide Importance that are regularly used for the production of field crops, would be unavailable for agricultural use during Project construction. The western section of the borrow site would not be returned to agricultural use and is anticipated to provide wildlife habitat in the form of freshwater ponds, marsh, and scrub-shrub habitat, resulting from rainwater and/or groundwater filling the excavations and natural recruitment of associated vegetation. Therefore, the Project would result in conversion of up to 23 acres of Prime Farmland and 0.07 acre of Farmland of Statewide Importance to non-agricultural use. The maximum conversion would represent less than 0.01% of the total Farmland, total Prime Farmland, and total Farmland of Statewide Importance in San Joaquin County. This alteration in land use would not substantially affect overall farmland acreage or agricultural productivity in San Joaquin County. Moreover, the flood control improvements provided by the Project would protect the remaining farmland on Bouldin Island from future flood damage. The Project would have a less-than-significant-impact on farmland.

b) Would the Project conflict with existing zoning for agricultural use, or a Williamson Act contract?

The San Joaquin County General Plan designates General Agriculture Zones to protect agricultural lands and support ongoing commercial farming operations (San Joaquin County

2016). The entire Project Area falls within the AG-40 zoning, which requires parcels to be at least 40 acres and intended for general agricultural use (City of Manteca 2024). As of 2023, 374.8 acres of Bouldin Island are enrolled in a Williamson Act contract (California DOC 2023). However, no portion of the Project Area falls within a Williamson Act contract.

The western portion of the borrow site (up to 23 acres) would not be returned to agricultural use after the Project, and is anticipated to passively establish freshwater pond, marsh, and/or scrub-shrub habitat. This conversion represents less than 0.01% of the total Farmland, total Prime Farmland, and total Farmland of Statewide Importance in San Joaquin County, and therefore would not substantially affect overall farmland acreage or zoning for agricultural productivity at the county scale. Agriculture would continue to be the primary land use on Bouldin Island, and the levee rehabilitation would add protection to this resource. The impact of the Project would be less than significant.

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

The Project Area is not zoned as forest land or timberland and would not impact zoning of forest land or timberland. No impact would occur.

d) Would the Project result in the loss of forest land or conversion of forest land to non-forest use?

The Project would not result in the loss of forest land or conversion of forest land to non-forest use as none is present in the Project Area. No impact would occur.

e) Would the Project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

The Project would not involve other changes to the existing environment, beyond those discussed in (a) and (b) above, that could result in additional conversion of Farmland to non-agricultural use or any conversion of forest land to non-forest use. Conversion of the Project borrow site to non-agricultural use would not interrupt or preclude ongoing agricultural operations elsewhere on Bouldin Island or result in additional conversion of farmed or forested land beyond the borrow site. The impact would be less than significant.

2.3 Air Quality

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the Project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	✓	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	✓	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	✓	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☐	✓

2.3.1 Environmental setting

The proposed Project would be located in the northern region of the San Joaquin Valley Air Basin (SJVAB), which includes Fresno, Kern (western and central), Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare counties, and is administered by the San Joaquin Valley Air Pollution Control District (SJVAPCD). The SJVAB is bounded by mountains to the east, west, and south, with an opening to the north into the Sacramento Valley. The region experiences relatively long summers with generally hot and dry conditions, and short winters with cool, wet conditions. Subtropical high air pressure events can occur year-round and result in the formation of strong atmospheric inversion layers. The combination of these topographical and meteorological factors can prevent the dispersion of pollutants and is particularly conducive to poor air quality.

2.3.1.1 Criteria air pollutants

The federal Clean Air Act of 1970 (Section 6.1) and California Air Resources Board have established air quality standards for several common pollutants: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, sulfur dioxide, sulfates, and hydrogen sulfide (CARB 2024a). Air quality data for the SJVAB from 2018 to 2023 are summarized in Table 2-2 and describe the existing conditions for some of the criteria air pollutants in the SJVAB.

Table 2-2. Observations and federal and state standards for ozone and particulate matter in the SJVAB, 2018 to 2023.

Year	Pollutant (averaging time)	Maximum concentration[1]	Federal standard	Days exceeding federal standard	State standard	Days exceeding state standard
2018	Ozone (1-hour)	0.129 ppm	NA	NA	0.09 ppm	42
	Ozone (8-hour)	0.101 ppm	0.070 ppm	111	0.070 ppm	112
	$PM_{2.5}$ (daily)	190 µg/m^3	35 µg/m^3	42	NA	NA
	PM_{10} (daily)	250 µg/m^3	150 µg/m^3	10	50 µg/m^3	164
2019	Ozone (1-hour)	0.110 ppm	NA	NA	0.09 ppm	24
	Ozone (8-hour)	0.093 ppm	0.070 ppm	96	0.070 ppm	100
	$PM_{2.5}$ (daily)	84 µg/m^3	35 µg/m^3	21	NA	NA
	PM_{10} (daily)	652 µg/m^3	150 µg/m^3	16	50 µg/m^3	130
2020	Ozone (1-hour)	0.142 ppm	NA	NA	0.09 ppm	50
	Ozone (8-hour)	0.114 ppm	0.070 ppm	119	0.070 ppm	121
	$PM_{2.5}$ (daily)	200 µg/m^3	35 µg/m^3	52	NA	NA
	PM_{10} (daily)	517 µg/m^3	150 µg/m^3	39	50 µg/m^3	157
2021	Ozone (1-hour)	0.125 ppm	NA	NA	0.09 ppm	41
	Ozone (8-hour)	0.100 ppm	0.070 ppm	101	0.070 ppm	104
	$PM_{2.5}$ (daily)	557 µg/m^3	35 µg/m^3	53	NA	NA
	PM_{10} (daily)	438 µg/m^3	150 µg/m^3	16	50 µg/m^3	152
2022	Ozone (1-hour)	0.141 ppm	NA	NA	0.09 ppm	31
	Ozone (8-hour)	0.113 ppm	0.070 ppm	102	0.070 ppm	105
	$PM_{2.5}$ (daily)	63 µg/m^3	35 µg/m^3	41	NA	NA
	PM_{10} (daily)	251 µg/m^3	150 µg/m^3	4	50 µg/m^3	171
2023	Ozone (1-hour)	0.117 ppm	NA	NA	0.09 ppm	26
	Ozone (8-hour)	0.095 ppm	0.070 ppm	73	0.070 ppm	77
	$PM_{2.5}$ (daily)	123 µg/m^3	35 µg/m^3	11	NA	NA
	PM_{10} (daily)	270 µg/m^3	150 µg/m^3	3	50 µg/m^3	126

Source: CARB (2024b)

Notes: µg/m^3 = micrograms per cubic meter of air
NA = not applicable
$PM_{2.5}$ = respirable particulate matter (less than 2.5 microns in diameter)
PM_{10} = respirable particulate matter (less than 10 microns in diameter)
ppm = parts per million

[1] Maximum concentration observed in the SJVAB is based on national reference or equivalent method, which adjusts observations to standardized conditions to eliminate variability and allow for comparison across locations.

Air quality in the SJVAB does not consistently meet all applicable air quality standards. The SJVAB is currently designated as being in nonattainment for state ozone, $PM_{2.5}$ (respirable particulate matter less than 2.5 microns in diameter),[4] and PM_{10} (respirable particulate matter less than 10 microns in diameter) standards and for federal ozone and $PM_{2.5}$ standards (CARB 2024c). The Project Area is designated as being in attainment for state and federal carbon monoxide, nitrogen dioxide, and sulfur dioxide standards; state lead and sulfate standards; and federal PM_{10} standards (CARB 2024c). The SJVAPCD developed air quality management plans for carbon monoxide, particulate matter, and ozone between 1998 and 2024 to support attainment of federal and state air quality standards through emissions reductions (SJVAPCD 2025). Consistent with

[4] State $PM_{2.5}$ annual arithmetic mean standard.

these plans, the SJVAPCD has also developed emissions thresholds for criteria pollutants to be used in determining the significance of air quality effects of individual construction projects. Because the SJVAPCD thresholds are more stringent than those set by the U.S. Environmental Protection Agency emissions from construction projects are considered significant if they exceed the local thresholds established by the SJVAPCD. Criteria air pollutants and precursors of primary concern for construction activity in California include ozone precursors (e.g., nitrogen oxides, reactive organic gases), carbon monoxide, sulfur oxides, and fugitive and exhaust dust particulate matter (PM_{10} and $PM_{2.5}$) (SJVAPCD 2015). The SJVAPCD (2015) thresholds follow:

- 100 tons per year of carbon monoxide
- 15 tons per year of $PM_{2.5}$
- 15 tons per year of PM_{10}
- 10 tons per year of nitrogen oxides
- 10 tons per year of reactive organic gases
- 27 tons per year of sulfur oxides

2.3.1.2 Sensitive receptors

Some individuals have heightened health risks associated with exposure to air pollution, and for some air quality constituents, impacts are determined based on the distance to the closest sensitive receptor. Sensitive receptors include, but are not limited to, residential areas, schools, and hospitals. The nearest sensitive receptors to the Project Area are the Willow Berm Marina, located across the Mokelumne River about 0.3 mi from the Project Area; several mobile home parks across the Mokelumne River, ranging from 0.2 to 0.6 mi from the Project Area; and the four rural residences on the northern end Bouldin Island, all farther than 1 mi away from the Project Area. Other rural residences in the vicinity are greater than 1 mi from the Project Area.

2.3.2 Findings

Project construction details (e.g., duration, timing, equipment use) were used to analyze potential Project impacts using the California Emissions Estimator Model, version 2022.1.1.29. This model estimates Project emissions, including exhaust from construction equipment, fugitive dust generated by construction activities, and emissions from vehicle travel over unpaved roads. Operational emissions were not analyzed because operations or maintenance activity would not change following Project construction. The California Emissions Estimator Model data entry and emissions summary sheet is included as Appendix A.

The modeling for the Project was based on the emission sources provided in Table 2-3 and the construction equipment and phasing provided in Table 1-1. Additional model assumptions included implementation of air quality BMPs included as part of the Project in conservation measure **CM-1** (e.g., use of an onsite water truck to control dust, limit speed on unpaved roads; Section 1.4.7). Model results for total anticipated Project emissions are shown in Table 2-4 and included in detail in Appendix A.

Table 2-3. Project emission sources and quantities used to determine emissions.

Emission source	Project quantities
Onsite fill material used for setback levee and pump station relocation	27,500 cubic yards
Imported Class 2 aggregate base used for construction of levee crown road	4,000 tons
Imported clean quarry stone used to armor fill on the upper waterside slope	18,000 tons
Imported levee embankment used for setback levee prism construction	52,500 cubic yards
Onsite peat removed from the borrow site and placed in designated disposal areas	13,500 cubic yards
Construction equipment	3 excavators 2 bulldozers 2 blades 2 compactors 3 water trucks 1 skip loader 4 crew pickups 3,500 trips for semi-bottom dump trucks, onsite fill 4,600 total trips for semi-bottom dump trucks, imported fill and aggregate 1,000 trips for side dump trucks, imported quarry stone 2 pumps (water truck) 2 pumps (borrow site and sump) Planting equipment (to be determined) 1 crane 2 emergency and diesel generators 1 tool truck
Employee commute trips	4 employee trips/day 21 mi one way[1]

Source: MBK Engineers (2025)
[1] Estimated employee commute travel distance

Table 2-4. Maximum modeled Project construction emissions (tons/year).

	CO	$PM_{2.5}$	PM_{10}	NO_X	ROG	SO_X
Project emissions	4.27	0.71	2.88	4.22	0.48	0.01
SJVAPCD threshold for individual projects	100	15	15	10	10	27

Source: California Emissions Estimator Model, version 2022.1.1.29 (2024), ICF (2022), SJVAPCD (2015)
Notes: CO = carbon monoxide
$PM_{2.5}$ = respirable particulate matter (less than 2.5 microns in diameter)
PM_{10} = respirable particulate matter (less than 10 microns in diameter)
NO_x = nitrogen oxides
ROG = reactive organic gases
SJVAPCD = San Joaquin Valley Air Pollution Control District
SO_x = sulfur oxides

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

Based on air quality modeling, Project construction is expected to result in temporary emissions that are well below SJVAPCD thresholds and therefore do not conflict with emissions reductions goals outlined in SJVAPCD air quality attainment plans for carbon monoxide, particulate matter, and ozone (SJVAPCD 2015). BMPs would be implemented as part of conservation measure **CM-1** (Section 1.4.7) to ensure that emissions of ozone precursors would be minimized. Long-term operational emissions would not change. The Project would not conflict with or obstruct implementation of an applicable air quality plan. The Project impact would be less than significant.

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

The modeled results summarized in Table 2-4 demonstrate that emissions resulting from Project construction activities are not expected to exceed annual thresholds for criteria air pollutants for which the SJVAB is currently designated as being in nonattainment (including $PM_{2.5}$, PM_{10}, carbon monoxide, and primary ozone precursors [e.g., nitrogen oxides and reactive organic gases]), and implementation of BMPs included in conservation measure **CM-1** (Section 1.4.7) would ensure that emissions are minimized. Long-term operational emissions would not change as a result of the Project. Although Project construction would result in some emissions for which the SJVAB is not in attainment, the minimal amount and temporary nature of these emissions would not result in a cumulatively considerable net increase of these pollutants. Therefore, the Project impact would be less than significant.

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

The nearest sensitive receptors to the Project Area are the Willow Berm Marina, located across the Mokelumne River about 0.3 mi from the Project Area; several mobile home parks across the Mokelumne River, ranging from 0.2 to 0.6 mi from the Project Area; and the four rural residences on the northern end Bouldin Island, all farther than 1 mi away from the Project Area. Other rural residences in the vicinity are greater than 1 mi from the Project Area.

The Project would not result in substantial pollutant concentrations (see Table 2-4). Implementation of BMPs included in conservation measure **CM-1** (Section 1.4.7) would minimize pollutant concentrations, and Project construction activities would be temporary, resulting in increased pollutants for approximately 12 total months (in two 6-month periods). Therefore, the Project's impact on exposing sensitive receptors to substantial pollutant concentrations would be less than significant.

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

Project construction is not expected to result in other emissions, such as those leading to objectionable odors, that would adversely affect a substantial number of people. Post-construction, the Project would not result in any change to current operation or maintenance activities that would result in additional emissions. The Project would have no impact.

2.4 Biological Resources

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

2.4.1 Environmental setting

Resource evaluations were performed to characterize habitat and identify sensitive biological resources within or near the Project Area. These evaluations included a desktop review of special-status species with the potential to occur, land cover classification and vegetation mapping, a delineation of potentially jurisdictional waters/wetlands, surveys for special-status plants, and a

field habitat assessment for special-status fish and wildlife species. Results of these evaluations were used to inform impact analyses and development of conservation and mitigation measures.

2.4.1.1 Definitions

Special-status species are defined in this IS/MND as those that are:

- listed as endangered or threatened, rare, or proposed/candidates for listing under the federal Endangered Species Act (ESA) and/or California ESA;
- designated by CDFW as a Species of Special Concern;
- designated by CDFW as Fully Protected under the California Fish and Game Code (Sections 3511, 4700, 5050, and 5515);
- designated as rare under the California Native Plant Protection Act; and/or
- included on CDFW's Special Vascular Plants, Bryophytes, and Lichens List with a California Rare Plant Rank (CRPR) of 1, 2, 3, or 4 (CDFW 2025a).

Sensitive natural communities (i.e., legacy natural communities in CDFW's California Natural Diversity Database [CNDDB] and vegetation alliances or associations as described in the online version of *A Manual of California Vegetation* [MCV; CNPS 2025b]) are defined as vegetation types with a state ranking of S1 (critically imperiled), S2 (imperiled), or S3 (vulnerable) on CDFW's California Sensitive Natural Communities List (CDFW 2025b).

2.4.1.2 Desktop review

Special-status plant, fish, and wildlife species and sensitive natural communities with the potential to occur within or near the Project Area were identified through a query of the following sources:

- CDFW's CNDDB (CDFW 2025c) for the U.S. Geological Survey (USGS) 7.5-minute quadrangle in which the Project is located (Bouldin Island) and the surrounding eight quadrangles (Rio Vista, Isleton, Thornton, Terminous, Holt, Woodward Island, Brentwood, and Jersey Island) collectively referred to as the Project region;
- USFWS's Information for Planning and Conservation portal (USFWS 2025a);
- National Marine Fisheries Service's West Coast Region, California Species List Tool (NMFS 2016); and
- California Native Plant Society's (CNPS) online Inventory of Rare and Endangered Vascular Plants of California (CNPS 2025a).

In addition to the database queries described above, the following information sources were reviewed for additional information on potential species' presence:

- USFWS species' profiles, recovery plans, and 5-year reviews;
- Scientific research and/or peer-reviewed journal articles;
- CDFW trawl and salvage monitoring data (CDFW 2025d through CDFW 2025g);
- Unpublished technical reports; and
- Citizen science and observation databases, including eBird (eBird 2025), Bat Acoustic Monitoring Visualization Tool (CBI and USFS 2025), and iNaturalist (iNaturalist 2025).

Database query results are presented in Appendix B (special-status plants and sensitive natural communities) and Appendix C (special-status fish and wildlife species). The habitat preferences

and distributional range of each species from the database queries were compared with existing information and the results of field surveys to determine the potential for each species to occur within the Project Area. If a species' required habitat was lacking from the Project Area or if the Project Area is outside the species' known distribution or elevation range, the species was considered not likely to occur.

2.4.1.3 Vegetation mapping and sensitive natural communities

Stillwater Sciences biologists mapped the vegetated and non-vegetated habitats in the Project Area on April 2–3 (R. Thoms, J. Canto-Adams, and M. Montjoy) and July 1–2, 2025 (J. Canto-Adams and R. Wynd), concurrent with botanical surveys (Section 2.4.1.5). Vegetation types were assessed to the extent necessary to determine where there was suitable habitat for special-status wildlife and plant species and to document sensitive natural communities. Sensitive natural communities with the potential to occur in the Project Area were identified prior to field surveys by querying CNDDB as described in Section 2.4.1.2 (Appendix B). If a sensitive natural community was identified in the field, the location and population boundaries were digitally mapped, and a California Native Plant Society (CNPS) vegetation assessment field data form was completed using the CDFW/CNPS standards and protocols for vegetation sampling and mapping (CDFW 2018). Surveys for blue elderberry (*Sambucus mexicana*) following USFWS guidelines (USFWS 2017) for assessing habitat for the federally listed valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) were also conducted during vegetation mapping.

Land cover within the Project Area is largely composed of non-native ruderal herbaceous vegetation. Vegetation on the water side of the levee rehabilitation area is minimal and includes a sparse patch of small, non-native trees and shrubs growing on the rock slope; occasional patches of non-native herbaceous vegetation; and discontinuous patches of native tules (*Schoenoplectus* spp.) below MHW. During the 2025 field surveys, two sensitive natural communities were identified in the levee rehabilitation area: Field Horsetail – Scouringrush Horsetail – Variegated Scouringrush Wet Meadow (*Equisetum* [*arvense, variegatum, hyemale*] Herbaceous Alliance) and Hardstem and California Bulrush Marshes (*Schoenoplectus* [*acutus, californicus*] Herbaceous Alliance). The interior slope of the levee rehabilitation area, including the existing pump station, is dominated by non–native annual grasses and forb species. The borrow site (Figure1-1) consists of open water ponds with native and nonnative herbaceous vegetation and willow (*Salix* spp.) patches along the perimeter, existing access routes with minimal vegetation, and areas under active agricultural production. No blue elderberry plants were documented in the Project Area. Habitat types in the Project Area are summarized in Table 2-5 and depicted in Figures 2-1a through 2-1e.

Table 2-5. Land cover and vegetation types in the Project Area[1] (in acres).

Landcover type	Manual of California vegetation alliance[2]	Sensitive natural community?[3]	Acres in Project Area		
			Levee	Borrow	Total
Herbaceous	Agriculture	no	–	23.4	23.4
	Field horsetail – scouringrush horsetail – variegated scouringrush wet meadow (*Equisetum* [*arvense*, *variegatum*, *hyemale*] Herbaceous Alliance)	yes (S3S4)	0.9	–	0.9
	Hardstem and California Bulrush Marshes (*Schoenoplectus* (*acutus*, *californicus*) Herbaceous Alliance)	yes (S3S4)	0.7	–	0.7
	Upland mustards or star-thistle fields (*Brassica nigra – Centaurea* (*solstitialis*, *melitensis*) Herbaceous Semi-Natural Alliance)	no	–	29.3	29.3
	Wild oats and annual brome grasslands (*Avena* spp. – *Bromus* spp. Semi Naturalized Alliance)	no	23.3	–	23.3
Woody	Goodding's willow – red willow riparian woodland and forest (*Salix gooddingii – Salix laevigata* Forest & Woodland Alliance)	no	–	<0.1	<0.1
	Himalayan blackberry – rattlebox – edible fig riparian scrub (*Rubus armeniacus – Sesbania punicea – Ficus carica* Shrubland Semi-Natural Alliance)	no	<0.1	–	<0.1
Unvegetated	NA (Developed)	NA	4.4	2.0	6.4
	NA (Water)	NA	1.3	18.8	20.2
Total			**30.7**	**73.6**	**104.2**

[1] Minor adjustments to the Project Area boundaries may occur as construction plans are finalized. These modifications would not appreciably affect the acreages of land cover and vegetation types presented in Table 3-1 and Figures 3-1a through 3-1d, nor any effects conclusions.

[2] CNPS 2025b

[3] Status (CDFW 2025b):
S3 = Vulnerable
S4 = Apparently Secure
NA = not applicable



Figure 2-1a. Vegetation types in the Project Area (tile 1 of 5).



Figure 2-1b. Vegetation types in the Project Area (tile 2 of 5).



Figure 2-1c. Vegetation types in the Project Area (tile 3 of 5).



Figure 2-1d. Vegetation types in the Project Area (tile 4 of 5).

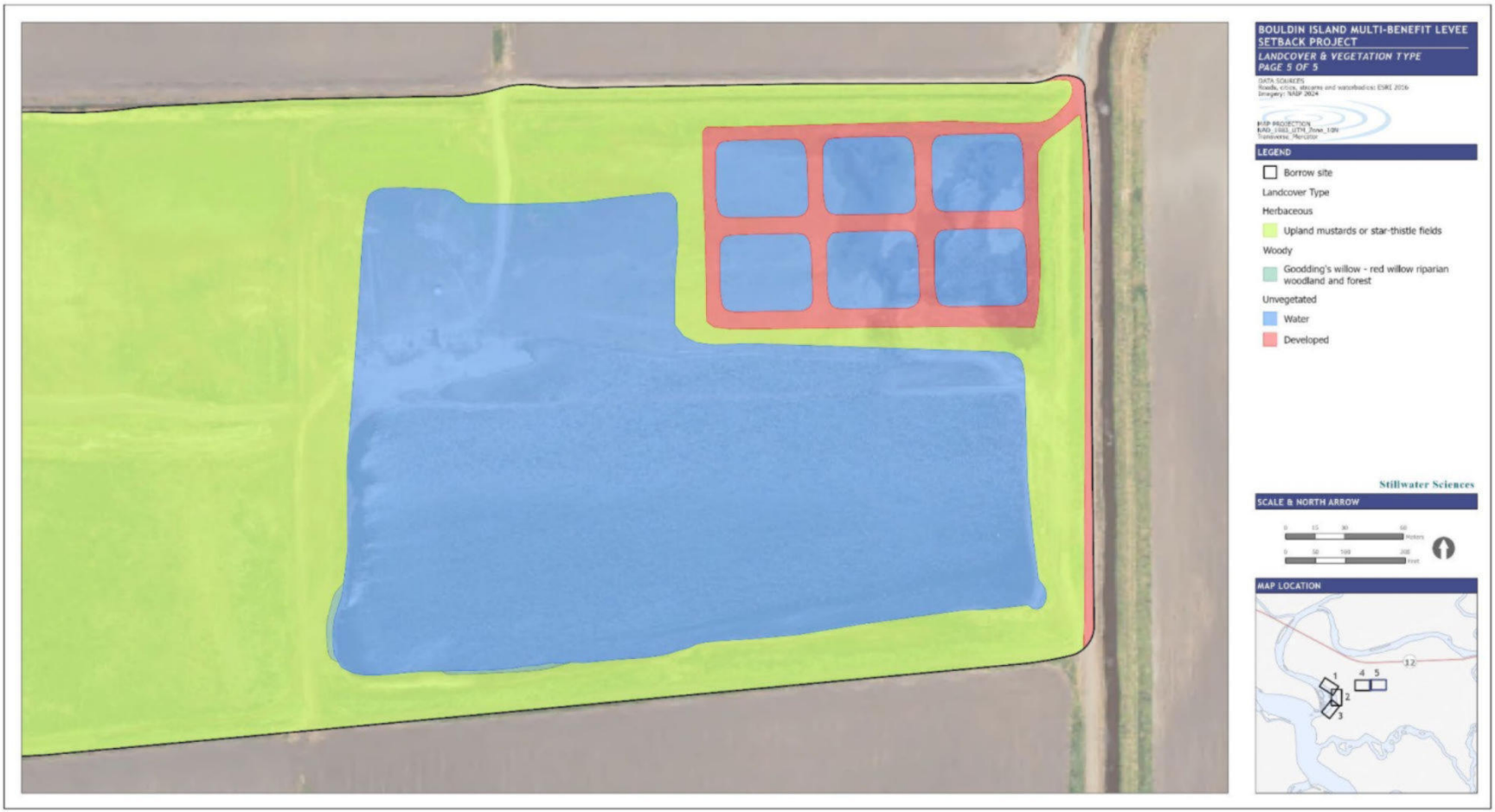

Figure 2-1e. Vegetation types in the Project Area (tile 5 of 5).

Herbaceous

Agriculture

Agricultural production was documented in the western portion of the borrow site. The field was under cultivation for corn (*Zea mays*) during the July 2025 botanical surveys. A variety of non-native grasses and forbs were prevalent or characteristic in fallow times and/or in the understory, including smartweeds (*Persicaria* spp.), fat-hen (*Atriplex prostrata*), annual blue grass (*Poa annua*), Italian wild rye (*Festuca perennis*), and wall barley (*Hordeum murinum*). A total of 23.4 acres (22.5% of the Project Area) of Agriculture were mapped in the Project Area (Table 2-5; Figure 2-1d).

Field Horsetail – Scouringrush Horsetail – Variegated Scouringrush Wet Meadow

Field Horsetail – Scouringrush Horsetail – Variegated Scouringrush Wet Meadow was documented on the interior and waterside of the levee banks in the northern half of the levee rehabilitation area. This vegetation type was dominated by the native smooth scouring rush (*Equisetum laevigatum*), with the presence of a variety of non-native grasses including Bermuda grass (*Cynodon dactylon*) and Johnson's grass (*Sorghum halepense*). Field Horsetail – Scouringrush Horsetail – Variegated Scouringrush Wet Meadow is a sensitive natural community, with a state ranking of S3S4 (CDFW 2025b). A total of 0.9 acres (0.9% of the Project Area) of Field Horsetail – Scouringrush Horsetail – Variegated Scouringrush Wet Meadow were mapped in the Project Area (Table 2-5; Figure 2-1a).

Hardstem and California Bulrush Marshes

Hardstem and California Bulrush Marshes were documented in various patches on the banks of the Mokelumne River in the northern half of the levee rehabilitation area. The dominant species was southern bulrush (*Schoenoplectus californicus*), with broad-leaved cattail (*Typha latifolia*), narrow-leaved cattail (*Typha angustifolia*), and smooth scouring rush characteristically present. Hardstem and California Bulrush Marshes are a sensitive natural community, with a state ranking of S3S4 (CDFW 2025b). A total of 0.7 acres (0.7% of the Project Area) of Hardstem and California Bulrush Marshes were mapped in the Project Area (Table 2-5; Figures 2-1a and 2-1b).

Upland Mustards or Star-Thistle Fields

Upland Mustards or Star-Thistle Fields (*Brassica nigra – Centaurea* [*solstitialis*, *melitensis*] Herbaceous Semi-Natural Alliance) were documented in the majority of the upland areas within the borrow site, aside from the agricultural field. This vegetation type consisted of a mix of forbs and non-native grass species, including rabbitfoot grass (*Polypogon monspeliensis*), tall annual willow herb (*Epilobium brachycarpum*), wild radish *(Raphanus sativus)*, and milkthistle (*Silybum marianum*). A total of 29.3 acres (28.1% of the Project Area) of Upland Mustards or Star-Thistle Fields were mapped in the Project Area (Table 2-5; Figures 2-1d and 2-1e).

Wild Oats and Annual Brome Grasslands

Wild Oats and Annual Brome Grasslands (*Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance) covered much of the levee rehabilitation area interior of the levee crown. This vegetation type was dominated by a variety of non-native grass and forb species, including rye grass, Johnson's grass, wild radish, ripgut brome (*Bromus diandrus*), mallow species (*Malva* spp.), wall barley, and poison hemlock (*Conium maculatum*). A total of 23.3 acres (22.3% of the Project Area) of Wild Oats and Annual Brome Grasslands were mapped in the Project Area (Table 2-5; Figures 2-1a through 2-1c).

Woody

Goodding's Willow – Red Willow Riparian Woodland and Forest

Goodding's Willow – Red Willow Riparian Woodland and Forest (*Salix gooddingii – Salix laevigata* Forest & Woodland Alliance) was documented in the borrow site in narrow patches along the western and southern edge of the pond. The dominant species included a mix of saplings including red willow (*Salix laevigata*), Goodding's willow (*Salix gooddingii*) and narrowleaf willow (*Salix exigua*), all under ten ft in height, with cattail species characteristically present. A total of 0.06 acres (<0.1% of the Project Area) of Goodding's Willow – Red Willow Riparian Woodland and Forest were mapped in the Project Area (Table 2-5; Figure 2-1e).

Himalayan Blackberry – Rattlebox – Edible Fig Riparian Scrub

Himalayan Blackberry – Rattlebox – Edible Fig Riparian Scrub (*Rubus armeniacus – Sesbania punicea – Ficus carica* Shrubland Semi-Natural Alliance) was present at the northern end of the levee rehabilitation site on the waterside bank of the levee. The dominant species within this vegetation alliance was Himalayan blackberry (*Rubus armeniacus*), with some cover of the native shrub California button willow (*Cephalanthus occidentalis*) and the non-native tree Chinese privet (*Ligustrum lucidum*). California pea *(Lathyrus jepsonii* var. *californicus*) was characteristically present among the Himalayan blackberry. A total of 0.06 acres (<0.1% of the Project Area) of Himalayan Blackberry – Rattlebox – Edible Fig Riparian Scrub were mapped in the Project Area (Table 2-5; Figure 2-1a).

Unvegetated

Unvegetated landcover types within the Project Area included Developed and Water. These landcover types were present in both the levee rehabilitation area and borrow site. Roads and rock slope protection composed much of the Developed cover, totaling 6.4 acres. Water cover documented in the Project Area included a small portion of the Mokelumne River as well as the pond complex in the borrow site. A total of 26.5 acres (25.4% of the Project Area) of unvegetated landcover were documented within the Project Area (Table 2-5; Figures 2-1a through 2-1c and 2-1e).

2.4.1.4 Waters and wetlands

Stillwater Sciences biologists (R. Thoms, A. Maher, and M. Montjoy) conducted a preliminary delineation of potentially jurisdictional wetlands and waters in the Project Area on April 1 and April 3, 2025 in accordance with the *Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Arid West Supplement) (USACE 2008).

The field delineation of potentially jurisdictional waters was conducted following the methods presented in *National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams: Final Version* (USACE 2025) and the *Rapid Ordinary High Water Mark (OHWM) Identification Data Sheet* (USACE 2024). In addition, guidance from USACE and the U.S. Environmental Protection Agency on proper interpretation of continuous surface water connection under the Clean Water Act was consulted (USACE and EPA 2025). During the field delineation, the extent of non-wetland waters was delineated by either the location of the OHWM for non-tidal waters, or the MHWL and high tide line (HTL) for tidal waters. Additional or extended waters and wetland features that may fall under the regulatory purview of CDFW or the Central Valley Regional Water Quality Control Board (RWQCB) were delineated in consideration of California Fish and Game Code (Section 1600 et seq.) and the Porter-Cologne Water Quality Control Act, respectively (Section 6.2).

The following resources were queried and referenced to inform the delineation:

- USFWS's National Wetlands Inventory online application, Wetlands Mapper (USFWS 2025b),
- Climate Analysis for Wetlands Table (WETS Table) (USDA NRCS 2025c),
- U.S. Department of Agriculture Natural Resources Conservation Service's Soil Survey Geographic Database (USDA NRCS 2025a), and
- Hydric Soils List for Sacramento County (USDA NRCS 2025b).

The 104.2-ac Project Area contains no wetlands, 2.51 ac of Waters of the U.S. (i.e., waters potentially jurisdictional under Section 404 of the Clean Water Act as well as waters potentially jurisdictional under Section 10 of the Rivers and Harbors Act), and a total of 3.28 ac below top of bank that is under state (i.e., CDFW) jurisdiction (Table 2-6). The Waters of the U.S. are associated with the Mokelumne River, which is listed as a Traditionally Navigable Water (TNW) by the Sacramento District of the USACE. These waters are classified as Riverine (tidal) based on the wetland classification standard (FGDC 2013, adapted from Cowardin et al. 1979).

Table 2-6. Preliminary Waters of the U.S. within the Project Area.

Location of waters feature[1]	Acres	Acres by jurisdiction		
		Section 10	Section 404	CDFW/Section 1600
Below MHWL	1.75	1.75	2.51	3.28
MHWL to HTL	0.76	–		
HTL to TOB	0.77	–	–	
Total		**1.75**	**2.51**	**3.28**

[1] Notes: HTL = high tide line
MHWL = mean high water line
TOB = top of bank

Several non-jurisdictional waters and wetlands features are within the Project Area, including ponds; agricultural drainage ditches of various sizes; and areas with hydrophytic vegetation, hydric soils, and wetland hydrology. These features were considered not jurisdictional due to a lack of surface water connectivity and agricultural use exemptions, respectively (33 CFR 328.3, USACE and EPA 2025).

2.4.1.5 Special-status plants

Stillwater Sciences biologists conducted special-status plant surveys on April 2–3 (R. Thoms, J. Canto-Adams, and M. Montjoy) and July 1–2, 2025 (J. Canto-Adams and R. Wynd). Botanical surveys for special-status plants were comprehensive, conducted during appropriate bloom periods, and followed accepted protocols (USFWS 2000, CDFW 2018).

No special-status plant species were observed during the botanical surveys for the Project. Previously documented occurrences of several special-status plant species overlap with the Project Area but were not found, including a 2002 occurrence of *Symphyotrichum lentum* (Suisun Marsh aster) consisting of 15 plants in three patches, all of which are within the Project Area (CDFW 2025c). Occurrences of two other species were historical (i.e., from 1892 and 1893 and/or imprecise, as noted in Appendix B. A comprehensive list of plants documented in the Project Area during the botanical surveys is included in Appendix D.

2.4.1.6 Special-status fish

Fish that could occur in the Mokelumne River are considered in this document due to the potential impacts to this waterway during the brief in-water pipe removal and replacement work as well as the potential for inadvertent impacts to the Mokelumne River during waterside work above MHWL. Ten special-status fish species were identified from database queries as potentially occurring in the Project region (Appendix C). Of these, only Pacific lamprey (*Entosphenus tridentatus*) has no or low potential to occur within or near the Project Area because only marginally suitable habitat is present, and very few individuals have been observed in the Mokelumne or San Joaquin rivers near the Project Area since 2000. The nine special-status fish species with moderate to high potential to occur within or near the Project Area are listed in Table 2-7, with life history timing presented in Table 2-8. Appendix C includes a brief description of habitat associations for the species identified from database queries.

Table 2-7. Special-status fish species with moderate to high potential to occur in the Project Area.

Common name ***Scientific name***	**Status Federal/State[1]**	**Likelihood to occur within the Project Area**
North American green sturgeon: southern DPS *Acipenser medirostris*	FT/SSC	**High.** The Mokelumne River within and immediately adjacent to the Project Area contains suitable rearing and migration habitat for juveniles and adults, but likely lacks suitable spawning habitat (NMFS 2017, CDFW 2025a). Green sturgeon have been salvaged at the state and federal fish collection facilities every month, indicating they are present in the San Francisco Bay-Delta year-round (74 Federal Register 52299, CDFW 2025b), though these facilities are more than 20 river mi from the Project Area. Designated critical habitat for this species includes the Mokelumne River within and adjacent to Project Area (NMFS 2009, 2016).
White sturgeon *Acipenser transmontanus*	-/SSC; Proposed ST	**High.** The Mokelumne River within and immediately adjacent to the Project Area contains suitable rearing and migration habitat for juveniles and adults but likely lacks suitable spawning habitat (NMFS 2017). White sturgeon are frequently salvaged at the state and federal fish collection facilities and observed in 20-mm trawl surveys, indicating they are present in the San Francisco Bay-Delta year-round (CDFW 2025a, b).
Sacramento splittail *Pogonichthys macrolepidotus*	-/SSC	**High.** The Mokelumne River within and immediately adjacent to the Project Area may contain suitable habitat. Splittail depend on brackish water rearing habitats in the San Francisco Estuary and on floodplain and river-edge spawning habitats upstream (Moyle et al. 2015). Fish migrate among these habitats annually. Existing channelization and levees likely limit the availability of suitable floodplain habitat. However, individuals have been captured around Bouldin Island within five mi of the Project Area (20-mm Survey Station 919 and 815) as recently as 2017 (CDFW 2025a).
Delta smelt *Hypomesus transpacificus*	FT/SE	**Moderate.** Spawning may occur in the San Joaquin or Mokelumne rivers that encompass Bouldin Island, though water temperatures within and adjacent to the Project Area are typically above the species' thermal preference for spawning during summer months (SCWA 2012a, USGS 2025). These waters are included in the delta smelt's designated critical habitat (USFWS 2015). The species is typically found in shallow water (less than 10 ft deep) (Moyle 2002), away from channel margins and areas with significant shade or structure (USFWS 2021). Delta smelt were last captured near the Project Area (at 20-mm Survey Station 815 and 919) in 2015 (CDFW 2025a) and are presumed locally extant (CDFW 2025a).
Longfin smelt, San Francisco Bay-Delta DPS *Spirnichus thaleichthys*	FE/ST	**High.** The San Joaquin River downstream of Medford Island is important spawning habitat, and numerous individuals have been observed in waters near the Project Area (20-mm Survey Station 815) in 2025 (CDFW 2025a). The Mokelumne River within and adjacent to the Project Area may support some spawning but is often above the species' thermal preference for spawning during summer months (SCWA 2012b, USGS 2025). Critical habitat has been designated for this species but does not include the Mokelumne River within or adjacent to the Project Area.

Common name *Scientific name*	Status Federal/State[1]	Likelihood to occur within the Project Area
Chinook salmon, Central Valley spring-run ESU *Oncorhynchus tshawytscha*	FT/ST	**Moderate.** Central Valley spring-run ESU Chinook salmon have some potential to occur in the Mokelumne River within and immediately adjacent to the Project Area. The Mokelumne and San Joaquin rivers can act as migratory pathways for adults or juveniles and may provide non-natal rearing habitat. However, temperatures in the lower Mokelumne and San Joaquin rivers and Delta are generally above the species' thermal preference (Moyle 2002, CDFW 2025a). Designated critical habitat for the Central Valley spring-run ESU does not include the Mokelumne River within or adjacent to the Project Area but is present in the nearby Georgiana Slough and Sacramento River (NMFS 2016). Essential fish habitat is present within the Project Area (NMFS 2016).
Chinook salmon, Sacramento River winter-run ESU *Oncorhynchus tshawytscha*	FE/SE	**Moderate.** Sacramento River winter-run ESU Chinook salmon have some potential to occur in the Mokelumne River within and immediately adjacent to the Project Area, which may provide migratory and non-natal rearing opportunities. However, temperatures in the lower Mokelumne and San Joaquin rivers and Delta are generally above the species' thermal preference (Moyle 2002, CDFW 2025a). Designated critical habitat for the Sacramento River winter-run ESU does not include the Mokelumne River in or adjacent to the Project Area but is present in the nearby Sacramento River (NMFS 2016, CDFW 2025a). Essential fish habitat is present within the Project Area (NMFS 2016).
Chinook salmon, Central Valley fall / late-fall run ESU *Oncorhynchus tshawytscha*	FSC/SSC	**Moderate.** This species has some potential to occur in the Mokelumne River within and immediately adjacent to the Project Area, which may provide migratory and non-natal rearing opportunities. However, temperatures in the lower Mokelumne and San Joaquin rivers and Delta are generally above the species' thermal preference (Moyle 2002, CDFW 2025a). Essential fish habitat is present in the Mokelumne River within and adjacent to the Project Area (NMFS 2016).
Steelhead, California Central Valley DPS *Oncorhynchus mykiss irideus*	FT/SSC	**Moderate.** California Central Valley steelhead likely use the Mokelumne River within and immediately adjacent to the Project Area on a seasonal basis as migration pathways for spawning adults and emigrating juveniles. The Mokelumne River in and immediately adjacent to the Project Area may provide non-natal rearing opportunities, but temperatures in the lower Mokelumne and San Joaquin rivers and Delta are generally above the species' thermal preference (Moyle 2002, CDFW 2025a). Critical habitat for the California Central Valley DPS includes the Mokelumne River within the Project Area (NMFS 2016).

Notes: CDFW = California Department of Fish and Wildlife
DPS = Distinct Population Segment
ESU = Evolutionarily Significant Unit
mm= millimeter

Federal
FE = Listed as endangered under the federal Endangered Species Act
FT = Listed as threatened under the federal Endangered Species Act
FSC = Federal species of concern

State
SE = Listed as endangered under the California Endangered Species Act
ST = Listed as threatened under the California Endangered Species Act
SSC = CDFW Species of Special Concern

Table 2-8. Timing of listed fish species life stages near the Project Area (bracketed heavy lines indicate the proposed Mokelumne River in-water work period of August 1 through October 31). Dark and light shading corresponds to periods of peak (dark) and shoulder (light) activity levels for each life stage.

Species ESU/DPS	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
North American green sturgeon – Southern DPS												
Adult Migration												
Juvenile Rear/Migration												
White sturgeon												
Adult Migration												
Juvenile Rear/Migration												
Sacramento splittail												
Adult Migration												
Spawning												
Juvenile Rear/Migration												
Delta smelt												
Adult Migration												
Spawning												
Larval/Juvenile Rearing												
Longfin smelt, San Francisco Bay Delta DPS												
Spawning												
Juvenile Rear/Migration												
Chinook salmon												
Central Valley spring-run ESU												
Adult Migration												
Juvenile Rearing												
Smolt Outmigration												
Sacramento River winter-run ESU												
Adult Migration												
Juvenile Rearing												
Smolt Outmigration												
Central Valley fall-/late-fall WSU												
Adult Migration												
Juvenile Rearing												
Smolt Outmigration												
Steelhead – Central Valley DPS												
Adult Migration												
Juvenile Rearing												
Smolt Outmigration												

2.4.1.7 Special-status wildlife

Database queries identified 41 special-status wildlife species as potentially occurring in the Project region (Appendix C). Stillwater Sciences biologists (M. Montjoy, R. Thoms, and J. Canto-Adams) conducted a wildlife habitat assessment on April 2–3, 2025 to determine the likelihood for these species to occur within the Project Area. Based on this assessment, 18 special-status wildlife species have moderate to high potential to occur within or near the Project Area (Table 2-9). The remaining 23 species have no or low potential to occur within or near the Project Area because the Project Area is outside the species' known range or lacks suitable habitat. Appendix C includes a brief description of habitat associations for the species identified from database queries.

Table 2-9. Special-status wildlife species with moderate to high potential to occur in the Project Area.

Common name	Status Federal/State	Likelihood to occur within the Project Area
Reptiles		
Northwestern pond turtle *Actinemys marmorata*	FPT/SSC	**High.** The man-made ponds and ditches within the Project Area provide suitable aquatic habitat, though complexity for basking (e.g., emergent logs) is lacking. High-quality suitable aquatic and basking habitats are present within and adjacent to the Project Area in and along the Mokelumne River. The portion of levee within the Project Area is routinely managed, travelled, and disturbed and the hard packed substrate and RSP of the levee provide sub-optimal nesting habitat for the turtle, though uplands may be used for overland dispersal. Stillwater Sciences biologists observed a northwestern pond turtle basking along the river adjacent to the Project Area during the April 2025 site visit. Multiple occurrences are documented within 5 mi of the Project Area, including elsewhere on Bouldin Island (CDFW 2025c).
Giant garter snake *Thamnophis gigas*	FT/ST	**High.** Suitable aquatic, foraging, and dispersal habitats are present in agricultural ditches and the Mokelumne River within the Project Area, and the waterside RSP levee slope within the Project Area provides suitable basking and brumation habitats. At least 19 occurrences are documented within approximately 10 mi of the Project Area, with at least 10 occurrences since 2014 (CDFW 2025c, USFWS 2020).
Birds		
Greater sandhill crane and lesser sandhill crane *Antigone canadensis tabida; Antigone canadensis canadensis*	–/ST, SFP (greater); –/SSC (lesser)	**High (winter foraging only).** The Project Area is outside the breeding range for the species, but suitable foraging habitat for overwintering sandhill cranes is present within the Project Area, and the species was documented immediately across the Mokelumne River in 2025. Staten Island, located just north of Bouldin Island, is an important overwintering ground for the species, supporting thousands of individuals each winter (eBird 2025).
American white pelican *Pelecanus erythrorhyncos*	–/SSC	**Moderate (foraging only).** While no nesting habitat is present within or in the vicinity of the Project Area, individuals may forage or loaf on or adjacent to the ponds within the Project Area or in the nearby Mokelumne River. Multiple occurrences are documented on Bouldin Island and in nearby Little Potato Slough (eBird 2025).
White-tailed kite *Elanus leucurus*	–/SFP	**High (foraging only).** Grassland and other vegetated areas suitable for foraging are present within the Project Area, and nesting habitat is present in the nearby vicinity. Stillwater biologists observed the species within and near the Project Area during the April 2025 site visit, and several occurrences are documented within 10 mi, including elsewhere on Bouldin Island (CDFW 2025c, eBird 2025).

Common name	Status Federal/State	Likelihood to occur within the Project Area
Northern harrier *Circus hudsonius*	–/SSC	**High (foraging only).** Suitable foraging habitat is present within the Project Area, and nesting habitat (e.g., wetlands, fallow fields) is present in the nearby vicinity. Stillwater Sciences biologists observed multiple individuals in and around the Project Area during the April 2025 site visit.
Bald eagle *Haliaeetus leucocephalus*	FD, BGEPA/ SE, SFP	**High (foraging only).** The Project Area and immediate vicinity lack suitable nesting habitat (e.g., large mature trees); however, foraging habitat is present within and adjacent to the Project Area, including in the Mokelumne River, ponds within the borrow site, and surrounding upland areas. Bald eagles have occasionally been seen on and around Bouldin Island over the last 10 years (eBird 2025), but the closest known nest is approximately 13 mi northwest of the Project Area along Prospect Slough (M. Pfeffer pers. comm. 2025).
Swainson's hawk *Buteo swainsoni*	–/ST	**High (foraging only).** Suitable foraging habitat is present within the Project Area, and nesting habitat is present in the nearby vicinity, particularly in the trees approximately 600 ft from the borrow site. A Swainson's hawk nest was documented on Bouldin Island in 2023, less than 1 mi from the Project Area (Stillwater Sciences and MBK Engineers 2023). Stillwater Sciences biologists observed multiple individuals within and around the Project Area during the April 2025 site visit.
Western burrowing owl *Athene cunicularia hypugaea*	–/SCE, SSC	**Moderate.** No suitable burrows were observed within the Project Area during the April 2025 site visit, but burrowing owls may utilize structures such as pipes and culverts, which may be present in agricultural areas adjacent to the Project Area. Stillwater Sciences biologists observed a burrowing owl on nearby Staten Island, approximately 2.5 mi from the Project Area, during a December 2024 site visit and multiple other occurrences were documented within 10 mi of the Project Area in 2025 (CDFW 2025c).
Short-eared owl *Asio flammeus*	–/SSC	**Moderate (foraging only).** Suitable foraging habitat is present within the Project Area, and nesting habitat (e.g., fallow fields, wetlands) is present in the nearby vicinity. Short-eared owl were documented on neighboring Staten Island, approximately 5 mi from the Project Area, in 2021 (iNaturalist 2025).
Loggerhead shrike *Lanius ludovicianus*	–/SSC	**High.** Suitable nesting and foraging habitats are present within the Project Area in the form of scattered trees and shrubs for nesting, and short vegetation and bare ground for hunting. Multiple occurrences are documented on Bouldin Island from 2013–2016 (eBird 2025).
Song sparrow ("Modesto" population) *Melospiza melodia*	–/SSC	**High.** Suitable nesting and foraging habitat is present within the Project Area and vicinity and includes most of the dense ruderal vegetation that occurs in areas along the Mokelumne River, irrigation canals, levee, and borrow site. The species may also forage in any of these habitats as well as in the grasslands, and open areas that make up most of the rest of the site. Several individuals were observed by Stillwater biologists during the April 2025 site visit.

Common name	Status Federal/State	Likelihood to occur within the Project Area
Yellow-breasted chat *Icteria virens*	–/SSC	**Moderate (foraging only).** Suitable foraging habitat is present within the Project Area along the waterways and in the vegetated parts of the Project Area. No suitable nesting habitat (established riparian forest) is present within the Project Area, but individuals could nest in the mature riparian stands near the borrow site. An occurrence is documented within 5 mi of the Project Area from 2024 (eBird 2025).
Yellow-headed blackbird *Xanthocephalus xanthocephalus*	–/SSC	**Moderate (foraging only).** Suitable foraging habitat is present within the Project Area along the waterways and in the vegetated parts of the Project Area. Occurrences are documented within 5 mi of the Project Area from 2020–2024 (eBird 2025).
Tricolored blackbird *Agelaius tricolor*	–/ST, SSC	**High (foraging only).** While no suitable nesting habitat (i.e., dense marsh or thickets over open water) is present within or adjacent to the Project Area and nesting colonies have not been documented in the nearby vicinity, suitable foraging habitat is present, and the species was observed by Stillwater biologists during the April 2025 site visit.
Yellow warbler *Setophaga petechia*	–/SSC	**Moderate (foraging only).** Suitable foraging habitat is present within the Project Area and vicinity in vegetation along the Mokelumne River, ditches and canals, and borrow site. The Project Area lacks suitable nesting habitat (i.e. large patches of riparian scrub-shrub or forest), but nesting could occur in nearby riparian forest. Multiple occurrences dated 2008, 2014, and 2018 are documented within 5 mi of the Project Area (eBird 2025).
Mammals		
Western red bat *Lasiurus frantzii*	–/SSC	**Moderate (foraging only).** Suitable foraging habitat is present within the Project Area and, while no roosting habitat is present within the Project Area, the mature riparian stands approximately 600 ft from the borrow site contain suitable roost trees. Detections of the species in 2024 are documented in the North American Bat Acoustic Monitoring Portal Grants Reporting and Tracking System cell 114067 less than 10 mi from the Project Area (CBI and USFS 2025).

Status:

Federal

FT = Listed as threatened under the federal Endangered Species Act
FD = Federally delisted
FPT = Federally proposed as threatened
BGEPA = Federally protected under the Bald and Golden Eagle Protection Act

State

SE = Listed as Endangered under the California Endangered Species Act
ST = Listed as Threatened under the California Endangered Species Act
SCE = State Candidate Endangered
SSC = CDFW Species of Special Concern
SFP = CDFW Fully Protected species

Other migratory birds

In addition to special-status species, other migratory birds could establish nests within and near the Project Area. The few suitable trees, emergent vegetation along the Mokelumne River and interior ditches, and ruderal vegetation present within the Project Area provide nesting habitat for a variety of ground, shrub, and tree-nesting bird species. Near the Project Area riparian scrub-shrub habitat along the northern levee and mature riparian forest stands near the borrow site also provide nesting opportunities. The nesting season for migratory birds is generally February 15 through August 31. Protection of migratory birds, including their active nests (i.e., containing eggs or young), is required by California Game and Fish Code Sections 3503, 3513, and 3800 as well as the Migratory Bird Treaty Act (MBTA) (16 United States Code 703 et seq.), Title 50 CFR Part 10.

2.4.2 Findings

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

Special-status plants

No special-status plant species were documented within the Project Area during 2025 botanical surveys; therefore Project-related impacts on special-status plants are not anticipated.

Various protections would be implemented to minimize the impact of effects on any special-status plant species—if found—including **MM-2** (a pre-construction targeted survey for special-status plants; biological monitoring of construction activities with the potential to adversely affect sensitive resources); and **MM-3** (training construction personnel on the potential presence, identification of, and avoidance measures for any special-status plants; Section 1.4.8). With these measures incorporated and with no special-status plant species within the Project Area, the Project would result in less than significant effects on special-status plants with mitigation incorporated.

Special-status fish

Special-status fish (as identified by the database queries) that may use the waterways in and surrounding the Project Area (as described in Section 1.2 and shown in Figure 1-1) have the potential to be directly or indirectly impacted by Project construction activities. Special-status fish could be impacted by the brief in-water work in the Mokelumne River to replace the District's pump station outfall pipes (as described in Section 1.4.2.2), including by effects of pile driving, or inadvertently during waterside work above MHWL. Due to their life history timing, the following species and life stages may be present within the Project Area during work that occurs on the waterside of the levee (Section 2.4.1.7, Table 2-6): North American green sturgeon Distinct Population Segment (DPS) (adult, juvenile), white sturgeon (adult, juvenile), Sacramento splittail (juvenile), Delta smelt (juvenile), longfin smelt (juvenile), Central Valley spring-run Chinook salmon Evolutionarily Significant Unit (ESU) (adult, juvenile), Sacramento River winter-run Chinook salmon ESU (adult, juvenile), Central Valley fall /late-fall run Chinook salmon ESU (adult, juvenile), and Central Valley steelhead trout DPS (juvenile).

Direct effects that could result from implementation of the proposed action include incidental direct disturbance (e.g., displacement from preferred habitat, cover, or feeding locations); incidental direct mortality/injury; and accidental spills of hazardous materials from construction

equipment. Indirect effects could include increased turbidity and suspended sediment, and temporary loss of SRA habitat.

Direct effects

Fish that may be present during the proposed in-water work period would have the potential to be directly disturbed (e.g., displaced from preferred habitat, cover, or feeding locations) by Project activities. While the potential timing of Project activities would co-occur with the potential presence of different life stages of multiple fish species, the life stages most likely to be impacted are adults and juveniles migrating through the Mokelumne River to suitable spawning or rearing habitat, and juveniles exploiting non-natal rearing opportunities. Removal and replacement of the pump station outfall pipes, including pile driving of the new pipe outfall support structure, could result in displacement or immediate or delayed death or injury of individual fish. Specifically, rapid pressure changes from pile driving could cause barotrauma, potentially resulting in damage to gas filled organs (e.g. swim bladder) for individuals of the species listed in Table 2-6. However, migratory, spawning and juvenile life stages of the species that may use the waters within and adjacent to the Project Area should be sufficiently mobile to avoid death or injury during this in-water work, or due to incidental spillage of earthen materials during waterside work above MHWL.

The less mobile life stages of delta smelt and longfin smelt associated with spawning—developing eggs and larvae—could still be present in the edge-water habitats in the Mokelumne River immediately adjacent to the Project Area during the proposed period of waterside work. If they are, they could be at risk of being crushed, smothered, or otherwise injured. This possibility is unlikely, however, because the thermal preference of spawning life stages for both species (7–15 degrees Celsius) is exceeded, on average, by mid-May in the Mokelumne River immediately adjacent to the Project Area (USGS 2025), which suggests that the bulk of potential spawning activity in this area would be concentrated in late spring when temperatures are suitable. Because delta smelt and longfin smelt eggs typically hatch after 10 to 14 days, the majority of eggs would hatch and be transported downstream prior to the start of waterside work (July 1).

Because Project construction plans were developed to avoid or minimize the amount and duration of waterside work, the likelihood of displacement of special-status fish species from preferred habitat, cover, or feeding locations and the likelihood of incidental direct mortality and/or injury of these species would be low. In addition, mitigation measures **MM-2**, **MM-3, MM-9, MM-10, and MM-11** would be implemented to minimize potential impacts on special-status species. These measures include biological monitoring by a qualified biologist during in-water work in the Mokelumne River (**MM-2**), worker environmental awareness training on species presence, habitat requirements, and applicable laws (**MM-3**), restricting in-water work to August 1 through October 31 when special-status fish are least likely to occur (**MM-9**), operating equipment from an upland berm and employing measures to minimize impacts to fish (**MM-10**), and limiting the duration and extent of in-water work and RSP placement to the minimum necessary (**MM-11**; Section 1.4.8).

Release of hazardous material into aquatic environments have the potential to directly impact fish via physiological impairment, the interruption of essential behaviors, or mortality and may also impact aquatic invertebrates that serve as prey for special-status fish and could compromise the suitability and availability of critical habitat To avoid or minimize impacts from hazardous materials during construction, conservation measures **CM-2** through **CM-4** (Section 1.4.7) require development and implementation of a SWPPP. The SWPPP would include spill prevention and response procedures, and all personnel would receive training to ensure compliance. Appropriate construction BMPs would be applied to prevent releases of diesel fuel

and other contaminants from equipment or storage areas. These measures ensure that if any incidental releases should occur they would be promptly addressed in accordance with established protocols, minimizing the potential for adverse effects on aquatic resources.

Considering the low likelihood of disturbance, injury, or mortality of special-status fish, and with implementation of the applicable conservation and mitigation measures, direct effects on the abundance, productivity, spatial structure or diversity of special-status fishes would be less than significant with mitigation incorporated.

Indirect effects

Removal and replacement of the pump station pipes have the potential to temporarily increase turbidity, which may affect special-status fish by causing temporary adverse physiological effects. The removal of old pipes and installation of the new pipes and associated RSP would be accomplished in approximately five days or less, but during that time, construction activities including pile driving could cause temporary sediment plumes that could negatively impact occupant fish species. However, given the volume and velocity of the Mokelumne River's flow within the Project Area, any turbidity plumes would likely dissipate rapidly. Further, the removal and installation constitute discrete, short-term events, rather than sustained sources of sediment production and turbidity. Any mobile life stage of fish using areas affected by potential, discreet plume events should be able to easily move out of the affected area given the unconfined nature of the waters in and around the Project Area. Because most of any immobile larval life stages of delta smelt would have likely hatched and dispersed by the time in-water work is initiated, and because of the short duration of in-water work at an area with high water velocity, it is unlikely that eggs and immobile larvae would be smothered by sediment inputs.

Additionally, underwater noise and disturbance resulting from pile driving activities could result in avoidance by special status fishes occupying the Mokelumne River near the Project area. However, the river adjacent to the Project area is wide, and project activities would only occur in a small area adjacent to the bank. As such, Project activities would not substantially disrupt migration or other essential behaviors. Occupant fish species would be sufficiently mobile to avoid underwater noise disturbance and continue essential life history functions.

Mitigation measure **MM-2** (Section 1.4.8) includes having a qualified biologist present during in-water work in the Mokelumne River. In addition, conservation measure **CM-2** (implement measures in the SWPPP; Section 1.4.7) includes BMPs to avoid and/or minimize potential impacts from erosion, including requirements around working during major precipitation events and requirements regarding appropriate erosion control measures.

The Project design includes a waterside bench, planted with native species, to restore riparian habitat temporarily disturbed during levee repair. Because the waterside bench would be constructed within the existing levee footprint, there would be no long-term loss in the amount or location of riparian habitat. Site preparation activities including clearing the sparse vegetation on the waterside slope, could temporarily decrease the amount of available SRA along the Mokelumne River. SRA cover provides shelter, resting, rearing, and feeding habitat for multiple fish species. However, loss of SRA would be temporary and minimal because the only vegetation removed would be herbaceous species and small woody plants (e.g., trees and shrubs) with a DBH of less than 4 in (plants with DBH greater than 4 in would be protected in place as feasible). Planting of the waterside bench is expected to improve SRA cover onsite, and habitat conditions for fish, beyond pre-Project levels within a few growing seasons. Overall, the Project is designed for a long-term net gain of nearshore shade and cover. Construction of the Project would also

help ensure long-term stability of SRA habitat because it would help prevent levee failure that could result in long-term SRA habitat losses.

With the appropriate conservation and mitigation measures incorporated, the indirect effects on special-status fish species related to temporary increases in turbidity and/or temporary losses of SRA would be less than significant with mitigation incorporated.

Special-status wildlife

Direct or indirect effects on wildlife that could occur as a result of the Project include the following:

- Injury and/or mortality of individuals and/or destruction of nests resulting from collision with vehicles or equipment;
- Abandonment of active nests or displacement from preferred nesting habitat due to removal of vegetation or auditory, vibratory, or visual disturbance;
- Temporary foraging disruption due to auditory, vibratory, or visual disturbance or loss of foraging habitat due removal of vegetation; and
- Impacts to aquatic habitats from accidental spills of hazardous materials

These effects could occur during any stage of Project implementation and are discussed further below for the special-status wildlife species with potential to occur within the Project Area.

Northwestern pond turtle

Northwestern pond turtles that may occur in or along the Mokelumne River, agricultural ditches or borrow site ponds within the Project Area would likely disperse away from areas disturbed during Project activities. Turtles that may utilize uplands within the Project Area could be impacted by vehicles or construction equipment during Project activities however, the implementation of conservation measure **CM-1** (enforce speed limits; Section 1.4.7) would minimize the risk of collisions with northwestern pond turtle. Cofferdam installation and partial dewatering of the sump area and interior agricultural ditches during pump station replacement would limit the likelihood of direct impacts to turtles. If partial dewatering does not occur, the sheet piles would still act as a physical barrier discouraging northwestern pond turtles from entering the in-water work area. Removal and replacement of the pump station outfall pipes in the Mokelumne River would be brief (approximately five days or less) and any northwestern pond turtles in the vicinity would likely move away from this area during active construction as they typically avoid disturbance.

Implementation of mitigation measures **MM-2, MM-3**, **MM-4, MM-10,** and **MM-11** (conduct biological monitoring, environmental awareness training, and preconstruction surveys for northwestern pond turtle, and methods for, and duration of in-water work, respectively; Section 1.4.8) would further minimize the potential for adverse effects on northwestern pond turtle. While northwestern pond turtles could potentially nest or aestivate within the Project Area, this is not likely as the RSP and hard packed ground of the levee crown and slopes provide sub-optimal substrate for burrowing. Additionally, mitigation measures **MM-2** and **MM-4** include preconstruction surveys for turtles and their nests and biological monitoring during construction activities with the potential to adversely affect sensitive natural resources, further reducing the potential for ground-disturbing activities to impact turtles or their nests.

Construction would result in a temporary disruption of upland basking habitat on the waterside levee during riparian bench creation and aquatic foraging habitat from a portion of the interior

agricultural ditch and Mokelumne River during pump station and outfall pipe replacement. However, the Project would ultimately result in habitat improvement for the species through revegetation of disturbed areas and creation of the waterside riparian bench, which would increase basking, nesting, and refuge opportunities. Conservation measures **CM-2** through **CM-4** (implement measures in the SWPPP; Section 1.4.7) would further reduce the potential for impacts to northwestern pond turtle habitat by limiting the likelihood of run-off or hazardous material spills that could degrade aquatic or upland habitats. The impact to northwestern pond turtle would be less than significant with mitigation incorporated.

Giant garter snake

The Project Area contains suitable aquatic habitat for giant garter snake in agricultural ditches and in and along the Mokelumne River, and marginally suitable upland habitat for basking or overwintering along the waterside levee slopes. Project activities in upland habitat (e.g., clearing, grading, compacting) have the potential to displace, injure, or kill individual giant garter snakes, particularly during the brumation season (typically October 1 to May 1). However, because ground-disturbing activities would not commence before May 1 during each year of construction and the upland habitat within the Project Area contains few burrows and largely consists of roadways and other disturbed areas, the potential for injury or mortality of a snake is low. Grading activity and collision with vehicles or equipment have the greatest potential for direct effects on individual snakes, but implementation of mitigation measures **MM-2, MM-3**, **MM-5** (biological monitoring, environmental awareness trainings, and giant garter snake specific avoidance measures including preconstruction surveys, respectively; Section 1.4.8) would substantially reduce this risk.

Cofferdam installation and partial dewatering of the sump area and interior agricultural ditches during pump station replacement would limit the likelihood of direct impacts to giant garter snakes. If partial dewatering does not occur, the sheet piles would still act as a physical barrier preventing giant garter snakes from entering the in-water work area. Removal and replacement of the pump station outfall pipes in the Mokelumne River would be brief (approximately five days or less). Giant garter snakes are sensitive to disturbance and would likely avoid areas of active work activity. The implementation of mitigation measures **MM-2**, **MM-10**, and **MM-11** would further minimize potential impacts to giant garter snakes during in-water work.

Construction would result in temporary disruption of habitat on the waterside levee during riparian bench creation and aquatic foraging habitat from a portion of the agricultural ditch and Mokelumne River during pump station and outfall pipe replacement. However, the Project would ultimately result in habitat improvement for the species through revegetation of disturbed areas and creation of the waterside riparian bench, which would provide beneficial habitat elements for the species. The impact to giant garter snake would be less than significant with mitigation incorporated.

Special-status and migratory birds

Project-related construction activities and vegetation removal during the nesting season for special-status or migratory birds (generally February 15 through August 31) could lead to direct or indirect impacts to bird species or their available nesting habitat. Project-related impacts may occur from construction noise (e.g., from heavy equipment, vehicles, generators, or human presence), vibration near ground nests or in nearby trees, vegetation removal (shrubs, ruderal vegetation, trees, or tree trimming), or visual disturbance (e.g., increased human or equipment activity near nests).

While the Project Area does not contain suitable habitat for arboreal or scrub-shrub nesting birds (including special-status species such as white-tailed kite [*Elanus leucurus*], Swainson's hawk, yellow warbler [*Setophaga petechia*], and yellow-breasted chat [*Icteria virens*]), vegetation suitable for nesting is present within 600 ft of the Project Area near the borrow site. The Project Area also lacks dense herbaceous or low-lying vegetation suitable for nesting by northern harrier (*Circus hudsonius*) or short-eared owl (*Asio flammeus*), but suitable nesting habitat for these species is present in the vicinity. The ruderal vegetation present within the Project Area is suitable for nesting by Modesto song sparrow (*Melospiza melodia*), and while no western burrowing owl burrows were observed within the Project Area during the April 2025 site visit, they could be established in the future.

A few special-status species may use the Project Area or its vicinity for foraging or dispersal only, including bald eagle (*Haliaeetus leucocephalus*), American white pelican (*Pelecanus erythrorhyncos*), yellow-headed blackbird (*Xanthocephalus xanthocephalus*), tricolored blackbird (*Agelaius tricolor)*, as well as greater and lesser sandhill crane (*Antigone canadensis tabida* and *Antigone canadensis canadensis*, respectively*)*.

Foraging habitat may be disturbed temporarily during Project construction by vegetation removal. While this may lower the quality of foraging habitat for some species, the effects would be temporary, and foraging birds can easily move away from Project-related disturbances to nearby alternative foraging habitat of similar value. Project-related vegetation removal would be kept to the minimum amount feasible, and implementation of mitigation measure **MM-1** would limit tree and shrub removal (Section 1.4.8). Furthermore, planting the waterside bench would eventually create beneficial riparian habitat that could support nesting and foraging, beyond what is currently present in the Project Area.

Non-special-status migratory bird species and their nests are protected by the MBTA and California Fish and Game Code Sections 3503, 3513, and 3800. Mitigation measures **MM-2, MM-3,** and **MM-6** (biological monitoring, worker environmental awareness, and nesting bird surveys and nest avoidance measures, respectively; Section 1.4.8) would minimize the potential for impacts to migratory birds, their nests, and their eggs to less-than-significant levels. Additional mitigation measures that further protect nesting birds include surveys for target special-status birds, including **MM-7** for Swainson's hawk and **MM-8** for western burrowing owl (Section 1.4.8). These species-specific measures would limit the potential for reproductive failure of target species. Therefore, with the inclusion of conservation and mitigation measures, potential impacts to migratory and special-status birds would be less than significant with mitigation incorporated.

Western red bat

The mature cottonwood (*Populus fremonti*) trees adjacent to the Project Area could potentially support roosting western red bats (*Lasiurus frantzii*). While bats may forage within the Project Area, no suitable roosting habitat is present within the Project Area. Project-related impacts to western red bats could occur from construction noise or vibration during daytime construction. Construction work would not occur prior to 6:00 a.m. or after 6:00 p.m. In addition, with implementation of mitigation measures **MM-1**, **MM-2**, and **MM-3** (limiting tree and shrub removal, biological monitoring, and environmental awareness training, respectively; Section 1.4.8) impacts to western red bat are anticipated to be less than significant.

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

In accordance with the requirements of AB 360[5] and the Department of Water Resources' Delta Flood Protection Program requirement for net long-term aquatic habitat improvement, this discussion is focused on potential impacts to Riparian Forest, Scrub-shrub, and Freshwater Marsh habitat. Potential effects on SRA habitats are previously described in the fish impact discussion above.

Potential impacts by habitat type include:

- Riparian Forest: There are no stands of Riparian Forest in the Project Area, therefore there would be no impacts to Riparian Forest.
- Scrub-shrub: Preparation of the levee setback to create the waterside planting bench would involve the removal of existing rock revetment above MHW, which has the potential to impact approximately 0.06 ac of Scrub-shrub habitat (dominated by Himalayan blackberry). Additionally, excavation of material from the borrow site has the potential to impact approximately 0.06 ac of Scrub-shrub habitat (classified as Goodding's Willow – Red Willow Riparian Woodland and Forest).
- Freshwater Marsh: with the exception of the minor in-water work for the pump station relocation, Project activities would not occur below MHW. The stands of Freshwater Marsh within the Project Area are below MHW and not in the vicinity of the existing pump station or the new pump station location, therefore there would be no impacts to Freshwater Marsh.
- Sensitive natural communities: two sensitive natural communities were documented within the Project Area (Table 2-5):
    - Field horsetail – scouringrush horsetail – variegated scouring rush wet meadow (state ranking of S3S4) is in the Project Area and has the potential to be impacted by Project activities (e.g., the preparation of the levee setback to create the waterside planting bench).
    - Hardstem and California Bulrush Marshes (state ranking of S3S4) is in the Project Area but is entirely below MHW. No Project activities are anticipated below MHW in the vicinity of this sensitive natural community, therefore there would be no impacts to this sensitive natural community.

Impacts to Scrub-shrub and sensitive natural communities would be temporary and implementation of mitigation measures **MM-1**, **MM-2**, and **MM-3** (limiting tree and shrub removal, biological monitoring and plant surveys, and environmental awareness training, respectively; Section 1.4.8) would help limit these impacts. Any long-term impacts or reduction to Scrub-shrub and/or sensitive natural communities would be offset by the Project implementation, which would revegetate the waterside planting bench using native species, including those that would create replacement Scrub-shrub habitat and those present within the sensitive natural communities. Therefore, Project-related impacts to riparian habitat or other sensitive natural communities would be less than significant with mitigation incorporated.

[5] AB 360 (1996) amended CWC §12300 et seq. and §12980 et seq. by restructuring the Delta Levee Maintenance Subventions and Special Delta Flood Protection Projects programs. Key provisions included: extending Subventions to Primary Zone Project levees and Special Projects to Northern Suisun Bay; reaffirming $6M annual appropriations per program with a 75% State cost share; and sunsetting the Delta Flood Protection Fund on July 1, 2006. The Act mandated expenditures achieve "net long-term habitat improvement" for aquatic species, authorized limited emergency work funding, and directed DWR to develop a Delta emergency response plan for levee failures.

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

No state or federally protected wetlands are present in the Project Area. The Project Area includes 2.51 ac of riverine (tidal) Waters of the United States, which are federally and state protected, and a total of 3.28 acres below top of bank under state (i.e., CDFW) jurisdiction, all of which are located on the Mokelumne River side of the levee. Below MHW, Project activities would include the removal of the existing pump station outfall pipes and the installation of equivalent pump station outfall pipes and support structure(s) in a new location, therefore there would be no net effect on waters below MHW. Above MHW, the Project would include the removal of the existing levee and revetment to create a waterside bench approximately 2.05 ft above MHW, and the construction of a setback levee approximately 20 ft landward. These activities would temporarily impact federally protected waters above MHW and below the HTL, and waters under CDFW's jurisdiction (i.e., up to top of bank). The Project would result in a net gain in federally protected waters that are above MHW and below the HTL, as well as waters under CDFW's jurisdiction. The waterside bench would be revegetated according to an enhancement and planting plan (to be developed), therefore impacts would be less than significant.

d) Would the Project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

The borrow site consists of previously degraded agricultural habitat that provides little habitat value for fish and wildlife. The habitat on the Project's levee is more likely to be used by wildlife, but it does not serve as a significant migratory corridor or nursery site. Any modifications to existing levee infrastructure would be temporary and would not interfere substantially with the movement of any native resident wildlife species or impede the use of any wildlife nursery sites. Therefore, potential impacts would be less than significant.

The Project includes modifications to existing levee infrastructure and would not include construction of any elements that would block or substantially impede or delay native resident or anadromous fish movement. Because the waterside bench would be constructed within the existing levee footprint and all work would occur above MHWL, the Project would not introduce any additional physical impediments to movement. Further, if incidental material spillage results from Project activities, individual fish occurring within the Project Area would be sufficiently mobile to avoid impacted areas and resume normal activities in nearby aquatic habitats. Additionally, construction activities above MHWL in the Project Area immediately adjacent to the Mokelumne River, as well as the brief periods of in-water work required during the removal and installation of pipes, may be temporary sources of atypical noise and turbidity that could result in avoidance and potentially delay movement or migration. However, given the availability of lateral aquatic habitat available to mobile species in the unconfined waters immediately adjacent to the Project Area, these activities are unlikely to impair fish movement. As such, potential impacts of Project activities on fish movement would be less than significant.

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

San Joaquin County has a tree ordinance to protect native oak trees, heritage trees, and historical trees (Development Title Section 9-1505.3). Native oak trees include valley oak (*Quercus lobata*), interior live oak (*Quercus wislizeni*), coast live oak (*Quercus agrifolia*), and blue oak

(*Quercus douglasii*) trees. Heritage oak trees are defined as native oak trees that have a single trunk diameter of 32 in or greater measured at 4.5 ft above the ground. Historical trees include any tree or group of trees designated by the Planning Commission because of their size, age, location, or history. No oak trees or historical trees were documented within the Project Area; thus, there would be no impact.

San Joaquin County also has an ordinance to protect riparian habitat (Development Title Section 9-1510). Losses to riparian habitat from the Project are described above and would be minimal and temporary; the creation and planting of the waterside bench would increase the amount of riparian habitat to more than is supported by existing conditions, therefore there would be no impact.

f) Would the Project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The Project Area is located within the Primary Zone of the Delta covered by the San Joaquin Multispecies Habitat Conservation Plan (SJCOG 2000). The Project does not conflict with provisions of this plan because it does not convert open space to a non-open space use. No other Habitat Conservation Plans or Natural Community Conservation Plans are applicable to the Project. There would be no impact.

2.5 Cultural Resources

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	✓	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	✓	☐	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	✓	☐	☐

2.5.1 Environmental setting

Natural Investigations Company, Inc. (Natural Investigations) conducted cultural resources investigations for the Project Area. The study is documented in a report titled *Cultural Resources Assessment for the Reclamation District No. 756: Bouldin Island Multi-Benefit Levee Setback Project, San Joaquin County, California* (Natural Investigations 2025) which includes a records search of the California Historical Resources Information System (CHRIS) conducted by the Central California Information Center (CCIC), located on the campus of California State

University, Stanislaus; a Sacred Lands File (SLF) search conducted by the NAHC; geoarchaeological sensitivity analyses; and a pedestrian survey of the Project Area. The cultural resources report includes precontact, ethnographic, and historic information for the Project Area.

2.5.1.1 Results of Cultural Resources investigations

The CCIC records search (No.: 13387L) identified three previously recorded cultural resources, P-39-000031 (a pump house foundation), P-39-005454 (a levee), and P-39-005483 (irrigation ditches), in the Project Area. The NAHC search of the SLF was negative. In response to the Native American outreach letter, Natural Investigations received emails from the Wilton Rancheria and Lucy Beyhan, Cultural Resource Manager II of the Confederated Villages of Lisjan Nation, requesting formal consultation. However, neither Wilton Rancheria nor Ms. Beyhan identified any culturally sensitive resources in the Project Area. The general proposed Project vicinity is sensitive for buried deposits of cultural resources, but the Project Area exhibits a low sensitivity for buried cultural resources because it primarily includes previously disturbed contexts consisting of fill and landforms such as marshes, sloughs, and river channels that are not optimal settings for precontact or historic occupation sites. Pedestrian surface survey of the entire Project Area identified the three previously recorded historic cultural resources, P-39-000031, P-39-005454, and P-39-005483, but did not identify any new cultural resources or any indication of buried deposits of cultural resources in the Project Area.

Sites P-39-005454 and P-39-005483 were previously recommended not eligible for the National Register of Historic Places (NRHP) or California Register of Historic Resources (CRHR). Natural Investigations concurs with the previous NRHP and CRHR determinations for these two sites and also determined that site P-39-000031 is not eligible for the NRHP/CRHR.

2.5.2 Findings

a) Would the Project cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?

Sites P-39-000031, P-39-005483, and P-39-005454 within the Project Area do not appear to meet the criteria for inclusion on the National Register of Historic Places or the California Register of Historical Resources, nor do they qualify as unique archaeological resources. Therefore, implementation of the Project would not impact any known historical resources.

Cultural resources investigations determined that sites P-39-000031, P-39-005454, and P-39-005483 do not meet the criteria for consideration as historical resources or historic properties and are not eligible for the NRHP/CRHR. Regardless, it is possible that project construction activities could inadvertently impact an unknown cultural resource (e.g., precontact or historic site and/or artifacts). Implementation of mitigation measure **MM-12** (procedures to follow, including work stoppage in the vicinity, upon inadvertent discovery of cultural resources; Section 1.4.8) would reduce any potential impacts to an inadvertently discovered and potentially significant historical resource to a less-than-significant level.

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

Cultural resources investigations did not identify any unique archaeological resources in the Project Area. Regardless, it is possible that project construction activities could inadvertently impact an unknown archaeological resource.. Implementation of mitigation measure **MM-12** (procedures to follow, including work stoppage in the vicinity, upon inadvertent discovery of cultural resources; Section 1.4.8) would reduce any potential impacts to an inadvertently discovered significant archaeological resource to a less than significant level.

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

The Sacred Lands File search for the Project Area returned negative results, and Natural Investigations not identify any human remains or evidence suggesting the presence of human burials within the Project Area. Project activities would predominantly occur in soils that have been previously disturbed by the construction of the levee system and associated infrastructure. As a result, the Project is not anticipated to impact any human remains. However, there remains a possibility of encountering previously undiscovered human remains during Project implementation. If an inadvertent discovery of human remains were to occur, it could result in a potentially significant impact to the remains. Implementation of conservation measure **CM-6** would reduce any potential impacts to inadvertently discovered human remains to a less than significant level.

2.6 Energy

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation?	☐	☐	✓	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	✓

2.6.1 Environmental setting

Energy sources are either renewable (e.g., solar, wind) or nonrenewable (e.g., fossil fuels) and can be used to power vehicles and equipment directly or converted to energy storage.

In 2022, California consumed more energy than all other states, except Texas, but its per capita consumption of 176 million British thermal units was the third lowest in the nation (USEIA 2025). The California Energy Commission, established by the Warren-Alquist Act in 1975 (Section 6.2), has been instrumental in limiting California's energy consumption, particularly by establishing energy efficiency standards that are updated every 3 years in Title 24 Building

Energy Efficiency Standards, which serve to reduce wasteful, uneconomical, and unnecessary uses of energy for the state and are updated every three years (CEC 2025).

The Project would use fossil fuels, a nonrenewable energy source, to power construction vehicles and equipment. The fossil-fuel consumption would be on a short-term basis during construction and would not persist upon Project completion. No electricity consumption would be associated with the Project.

2.6.2 Findings

a) Would the Project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation?

Project construction equipment would use fossil fuels for power. The use of such equipment is necessary to rehabilitate the Project's levee for flood protection. BMPs included in conservation measure **CM-1** (limit idling; Section 1.4.7) would ensure construction equipment would be used as efficiently as feasible. Fossil fuel consumption would be on a short-term basis during construction and would not persist upon Project completion. No electricity consumption would be associated with Project construction. Additionally, the existing pump station replacement would increase system energy efficiency. Therefore, Project impacts would be less than significant.

b) Would the Project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Current state and local plans, such as the California Title 24 Building Energy Efficiency Standards and the San Joaquin County General Plan, establish energy efficiency standards for actions not associated with the Project (e.g., new building construction, retrofitting existing developments). Therefore, the Project would not conflict with or obstruct any state or local plan for renewable energy or energy efficiency. There would be no impact.

2.7 Geology and Soils

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

2.7.1 Environmental setting

The Project Area lies within the Great Valley geomorphic province, which is crossed by few faults; however, it is bordered by the Coast Range province, which contains several active fault[6] zones that predominately exhibit right-lateral, strike-slip motion. The closest active faults designated by the California Geological Survey (CGS) are the Greenville Fault Zone and Green Valley-Concord fault zones, located about 23 mi and 28 mi, respectively, to the southwest of the Project Area (CGS 2015, 2017, 2018a,b; USGS 2003). The Hayward Fault Zone, a major active fault zone running parallel to the San Andreas Fault, lies about 40 mi southwest of the Project Area (CGS 2008). The Midland Fault Zone, which is designated by the CGS as potentially active,[7] runs north-south through the Delta about 5 mi west of the Project Area (Unruh and Hitchcock 2009, CGS 2017, USGS 2024). The most recent displacement along this fault is estimated to be mid- to early-Quaternary (0.7–2.6 million years before present) (CGS 2010).

The Greenville and Green Valley-Concord faults have estimated slip rates of 2–4 and 4–5 millimeters per year, respectively (USGS 2017, 2013). USGS estimates a 16% probability of an earthquake of magnitude 6.7 or greater occurring on either of these fault systems by the year 2043 (Aagaard et al. 2016). The Delta region also contains a series of "blind thrusts," faults that could cause considerable ground disturbance during a seismic event but do not cause surface rupturing (DCA 2023). Known blind thrusts in the Delta region include the Midland, Montezuma, Thornton Arch, West Tracy and Vernalis faults. A magnitude 6.25 to 6.75 earthquake on any of the regional blind thrust faults could produce strong shaking in the Delta (DCA 2023). CGS estimates the probabilistic peak ground acceleration within the Project Area to be a moderate value of 0.35–0.36*g*, meaning there is a 10% probability that the ground will experience a maximum shaking force equal to 35% of the acceleration of gravity within 50 years (CGS 2018c).

Delta islands are also susceptible to liquefaction because of shallow groundwater depths and the presence of sandy-peaty soils with low cohesive strength (CGS 2018c). Liquefaction or seismically induced waves in Delta channels may damage levees on Delta islands (DSC 2024).

Bouldin Island is composed predominately of marsh muds and peats that accumulated throughout the Holocene (<11,000 years before present) atop sand and eolian deposits from the Pleistocene-age Modesto Formation (Atwater 1982a,b; Helley and Graymer 1997). This process of tidal marshland formation occurred throughout the Delta region until land reclamation began in the late 1800s during Euro-American settlement (Whipple et al. 2012). By the 1930s, draining of marshes and wetlands and extensive levee construction transformed the Delta into an agricultural landscape. These changes in land use allowed for microbial oxidation and depletion of peat, resulting in land-surface subsidence of up to 26 ft below sea level on Delta islands (Drexler et al. 2009). Based on Light Detection and Ranging (or LiDAR) data from 2007 and 2015, Bouldin Island levees subsided at an average rate of approximately 1 centimeter per year (Brooks et al. 2018).

Bouldin Island soils are typically poorly drained mucks and silty-clayey loams (NRCS and UC Davis 2025). The soils within the Project Area are primarily mucky silt loam from the Venice and Rindge series. The marsh deposits in the Project Area are generally thicker than typical Delta sediments and contain interbedded sand layers, particularly near the pump station (Shannon &

[6] An *active fault* is defined by CGS as a fault having surface displacement within the Holocene epoch, or the past 11,700 years (CGS 2018c).
[7] A *potentially active fault* is defined by CGS as a fault that has offset geologic units from the Quaternary period, or the past 1,800,000 years (CGS 2003).

Wilson 2025). In general, Delta island soils have a relatively high potential for shrink-swell behavior, a primary characteristic of expansive soils[8] (ESA 2014). Though Delta soils are unlikely to rupture at the surface, they are prone to liquefaction, when seismic activity causes the ground to lose its strength and exhibit properties of a viscous fluid. This can occur in Delta soils during moderate earthquakes where shallow groundwater and loosely deposited sandy and silty alluvium from current and historical stream channels are present (DCA 2023). Liquefaction or seismically induced waves in Delta channels could cause structural failure of levees on Delta islands. Since 1900, there have been more than 160 levee failures in the Delta (DWR n.d.). The number of these failures due to seismic shaking is not known. However, levee failures can be caused by overtopping from floods, tidal fluctuations, and wind-driven waves, as well as structural failures due to inadequate foundations, subsidence, seepage, erosion, burrowing animals, and soil liquefaction from seismic activity (DWR n.d.).

A geotechnical study confirmed the presence of peat and mineral soils (lean clay, silt, silty and clayey sand, and poorly graded sand with silt) at the interior of Bouldin Island (Hultgren-Tillis Engineers 2021). Marsh deposits below the Project's levee fill, underlain by mineral soils and consisting predominantly of interbedded silt and peat, extend to greater depths than in most other locations in the Delta (Shannon & Wilson 2025). The thick marsh deposits, including peat and organic soils, are highly compressible and prone to long-term deformation. Based on these findings, peat and other organic soils are not suitable for use as levee or toe berm fill; imported fill would be used for levee and toe berm construction to ensure long-term stability.

Groundwater has previously been encountered within 4.5 ft of the ground surface at the interior of Bouldin Island (Hultgren-Tillis Engineers 2021) and at 13 ft below the ground surface near the Project Area (Hultgren-Tillis Engineers 2015). Groundwater beneath the levee is expected to remain near mean tide level (Shannon & Wilson 2025). Groundwater levels are artificially maintained below the island interior by pumping, as well as naturally from evapotranspiration from farmed crops (Hultgren-Tillis Engineers 2021).

2.7.2 Findings

a) Would the Project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area or based on other substantial evidence of a known fault?

The Project Area is not located near a delineated Alquist-Priolo fault zone, and ground rupture hazards are unlikely to affect the Project Area. The Green Valley-Concord fault is the nearest historically active delineated Alquist-Priolo zoned fault and is located 27 mi to the southwest of the Project Area. The Project's levee rehabilitation would result in no operational or land use change that would cause substantial adverse effects due to potential rupture of an earthquake fault. Therefore, the Project would have no impact.

ii) Strong seismic ground shaking?

[8] Expansive soils are characterized by the ability to undergo significant volume change as a result of varying soil-moisture content. The 2010 California Building Code, Title 24, Part 2, Section 1803.5.3: Geotechnical Investigations defines an expansive soil as meeting the following provisions: (1) plasticity index of $\geq$15; (2) >10% soil particles pass a No. 200 sieve (0.075 millimeter); (3) >10% soil particles are <0.005 millimeter; and (4) expansion index of >20.

The Project Area is located 22 mi away from the nearest active faults and, accordingly, lies in a zone with moderately low potential for strong seismic ground shaking. Preliminary seismic analysis indicated a low risk of liquefaction in the levee fill, but a moderate risk in the foundation sands, particularly between Stations 500+00 and 515+00 (Shannon & Wilson 2025). The Project design accounts for these risks by using appropriate fill and staged construction. The Project would not increase the potential for direct or indirect adverse effects related to seismic ground shaking. Therefore, the Project would have no impact.

iii) Seismic-related ground failure, including liquefaction?

The Project Area is located within the Delta, where seismically induced liquefaction has the potential to cause levee failure and flooding. The existing levee segment is considered unstable, with narrow geometry, over-steepened slopes, and associated risks of erosion, seepage, and slope instability. However, the geotechnical investigation indicated that the existing levee consists primarily of fine-grained material resistant to liquefaction. Therefore, the risk of liquefaction within the existing fill is considered low.

To mitigate seepage risks associated with sandy levee materials, the Project would include excavation of an exploratory trench beneath the setback levee crest, which would be backfilled with imported clay. Although liquefaction is possible in the soil beneath the marsh deposits, the Project design would rehabilitate 5,000 linear ft of levee from Stations 500+00 to 550+00 by setting the levee back with a waterside bench. This design is intended to meet the long-term goal of compliance with Bulletin 192-82 levee standards through sustainable rehabilitation.

The levee rehabilitation would not increase the potential for direct or indirect adverse effects due to seismic-related ground failure, including liquefaction. The replacement of the existing pump station would also increase system efficiency to reduce localized flooding and would therefore not increase the potential for direct or indirect adverse effects due to seismic-related ground failure, including liquefaction. The Project would have no impact.

iv) Landslides?

The levees surrounding Bouldin Island are susceptible to landslides. Portions of the Project Area levee have a very high Deep-Seated Landslide Susceptibility Class of VIII (California DOC 2025b). The inner portion of Bouldin Island has flat topography and is not susceptible to landslides. The Project would rehabilitate 5,000 linear ft of levee from Stations 500+00 to 550+00 by constructing a setback levee with a waterside bench, designed to achieve compliance with the Bulletin 192-82 levee standard. The setback levee would also be widened and raised with a 3H:1V landside slope, which would reduce landslide risk. The Project design would therefore not increase the potential for direct or indirect adverse effects related to landslides. The Project would have no impact.

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

The Project would remove topsoil during borrow site excavation (Figure 1-1). Due to the flat topography of Project Area, removal of this material would not result in substantial potential for erosion. During active construction, there would be a minor and temporary increase in the potential for stormwater-related erosion of surficial soil. To minimize the risk of soil erosion

during construction, the Project would implement conservation measure **CM-2** (e.g., develop and implement measures in the SWPPP to minimize erosion and run-off; Section 1.4.7). Upon completion of levee rehabilitation, the landside slope would be hydroseeded with a native grass seed mix for erosion control and ecosystem enhancement. The new setback levee would be widened and raised with a 3H:1V landside slope to meet the Bulletin 192-82 criteria, and the levee crown and roadway would be constructed with a compacted aggregate base to minimize runoff into the adjacent waterway. In the long term, these measures would stabilize the levee slope and reduce the risk of landslides that could result in soil erosion. Impacts of the Project on soil erosion and loss of topsoil would be less than significant.

c) Would the Project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

The existing levees surrounding Bouldin Island overlie potentially unstable geologic units composed of peat and silt-clay loams. The levees may contain high-permeability materials such as sand, gravel, animal burrows, and voids from tree roots, which can facilitate seepage. A geotechnical investigation has been performed to ensure that appropriate fill material from the borrow site would be used to improve levee stability (Shannon & Wilson 2025). To minimize seepage, imported clay would be used in construction of the setback levee.

The Project design would rehabilitate 5,000 linear ft of levee from Stations 500+00 to 550+00 by setting the levee back with a waterside bench, with the long-term goal to meet the Bulletin 192-82 levee standard through sustainable rehabilitation. Fill for the levee crest would be placed in two phases, with a minimum 3-month waiting period between stages, to allow consolidation of marsh soils and reduce the risk of ground movement. The new levee crest is expected to settle approximately 2 ft at its centerline and 2.5–3.5 ft at the landside hinge, and lateral movement and cracking are expected. However, cracking is prevalent throughout the Delta levee system, and overall the Project would enhance stability and would not result in increased potential for on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse. The impact would be less than significant.

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

The area surrounding the levee has expansive soils (i.e., peat and organic materials). The Project has, however, been designed to address the potential for expansive soil. Expansive soils would not be used to rehabilitate the levee or construct the toe berm. The Project design would rehabilitate 5,000 linear ft of levee from Stations 500+00 to 550+00 by setting the levee back with a waterside bench and have the long-term goal to meet the Bulletin 192-82 levee standard through sustainable rehabilitation. The levee improvements would enhance stability, and the Project would not increase long-term deformation or risks to life and property compared with existing conditions. Fill thickness and ground movement would also be monitored during and after construction. Therefore, potential effects from the Project being located on and/or utilizing expansive soils would be less than significant.

e) Would the Project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

Areas surrounding the Project are primarily agricultural, and the domestic residences on Bouldin Island are expected to use septic tanks. The Project would not include installation or disturbance to any existing septic tanks or alternative wastewater disposal system. Therefore, the Project would have no impact.

f) Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

No unique paleontological resources or geologic features are documented on Bouldin Island. Due to their relatively young age, the Holocene muds and peats that cover much of the tract are generally considered to have low potential for the presence of fossils. None of the geologic units known to contain fossils in the Delta, including the Franciscan, Mehrten, Modesto, or San Pablo formations, have been mapped within the Project Area. Excavation would primarily occur within Holocene deposits with low potential for paleontological resources. Haul routes would be restricted to existing roads. Therefore, the Project would have no impact.

2.8 Greenhouse Gas Emissions

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	✓	☐
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	✓

2.8.1 Environmental setting

Greenhouse gases (GHGs) can absorb and emit infrared radiation, trapping energy in the atmosphere and causing it to warm. Impacts from GHGs are more global than regional and are different from air pollutants that impact only the general area near where they are released. GHGs can occur naturally or as a direct result of human activities. State law defines GHGs to include the following emissions: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride (Health and Safety Code, § 38505(g)). The most common GHG resulting from human activity is carbon dioxide, followed by methane and nitrous oxide.

AB 32, the California Global Warming Solutions Act of 2006, went into effect in January 2008 (see also Section 6.2). This bill required a statewide GHG emissions limit, equal to the 1990 level

of 431 million metric tons of carbon dioxide equivalent (MMTCO2e),[9] to be achieved by December 31, 2020. California's GHG emissions have generally decreased after peaking in 2004, remaining below the AB 32 2020 GHG emissions limit since 2014 (CARB 2024d). California's current climate targets include meeting both the Senate Bill 32 emissions target, which includes reducing emissions to 40% below 1990 levels by 2030, and AB 1279 (see also Section 6.2) emissions target, which expanded upon AB 32 by aiming to reduce anthropogenic emissions to 85% below 1990 levels by 2045 and achieve carbon neutrality (CalEPA 2024). In 2022, California's GHG emissions from statewide emitting activities were 371.1 MMTCO2e, which is 9.3 MMTCO2e (2.4%) lower than 2021 levels (CARB 2024d). This continued the long-term trend of declining GHG emissions in California, except for anomalous trends during 2019 to 2021 due to the COVID-19 pandemic. From 2000 to 2022, the carbon intensity of California's economy (carbon pollution per million dollars of gross state product) decreased by 55%, and emissions per gross state product declined by 3% from 2021 to 2022 (CARB 2024d). The transportation sector consistently emits more GHG than any other sector, accounting for almost 38% of state GHG emissions in 2022. When upstream emissions from oil extraction, petroleum refining, and oil pipelines in California are included in this metric, transportation is responsible for 48% of statewide emissions in 2022 (CARB 2024d).

2.8.1.1 Local regulatory setting

The SJVAPCD has developed guidance for performance-based standards, or Best Performance Standards, to assess the significance of GHG emission totals for stationary sources and land use development projects. For these types of projects, adherence to Best Performance Standards or a demonstration of a 29% reduction from business-as-usual emissions would be required to demonstrate less-than-significant GHG emission impacts (SJVAPCD 2009). For construction projects, the SJVAPCD has not established such guidance or quantitative significance thresholds for GHG emissions.

The San Joaquin County General Plan aims to reduce GHG emissions primarily through changes in land use patterns (e.g., alternative transportation systems, sustainable building practices) (San Joaquin County 2016).

2.8.2 Findings

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

Project construction is expected to generate a maximum of 867 metric tons of CO_2e per year during construction, which is below the SJVAPCD annual threshold (Section 2.3). The Project would not result in changes to long-term GHG emissions following construction. Therefore, short-term construction-related impacts involving the generation of GHG emissions from the Project are expected to be less than significant.

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

[9] A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential. Carbon dioxide equivalents are commonly expressed as "million metric tons of carbon dioxide equivalents (MMTCO2e)." The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated global warming potential (EPA 2012).

Emissions associated with Project construction would be temporary and would not inhibit attainment of the statewide GHG emissions reduction targets established by Senate Bill 32 or AB 1279, as described in Section 6.2. The SJVAPCD has not established GHG emissions guidance or quantitative significance thresholds for GHG emissions from construction projects, and construction projects are not a mechanism by which the San Joaquin County General Plan aims to reduce GHG emissions (see Section 2.8.1.1). The Project would not result in changes to long-term GHG emissions following construction. The Project would therefore not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the GHG emissions; there would be no impact.

2.9 Hazards and Hazardous Materials

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	✓	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	✓	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	✓
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	✓
e) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	✓
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	✓

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	☐	☐	☐	✓

2.9.1 Environmental setting

Land uses surrounding the Project Area are predominantly agricultural and open space, along with some residential uses. These lands have the potential to contain hazardous substances. Petroleum products and pesticides are the most likely materials that may have been stored or released into the surrounding environment. Older gas wells and underground storage tanks used to store petroleum products and other hazardous materials may develop leaks. These leaks can lead to soil and groundwater contamination. A query of the California Department of Toxic Substances Control's database reveals that no known sites having cleanup, permitted, or other hazardous materials status are present within the Project Area (CDTSC 2025).

Groundwater at Bouldin Island is hydraulically connected to the surrounding waterways (CGS 2018c). Groundwater has previously been encountered within 4.5 ft of the ground surface at the interior of Bouldin Island (Hultgren-Tillis Engineers 2021). Because the interior of the island is below sea level, it is likely that water flows from the surrounding waterways into storage beneath Bouldin Island; therefore, there is potential for any water that becomes contaminated to be transported to the soils within and near the levees. Potential sources of contamination on the surface of the levees may include trash and debris from litter and illegal dumping, contaminant-laden sediment transported and deposited by the surrounding waterways, and surficial application of herbicides commonly used for weed control. No hazardous materials were detected in either the levee or the borrow site during the geotechnical investigation (Shannon & Wilson 2025).

2.9.2 Findings

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

Hazardous materials (e.g., diesel fuel) would be used by construction equipment during Project implementation. To minimize the risk of hazardous material release, the Project would require development of a SWPPP that would include measures to avoid and minimize potential impacts from hazards, hazardous materials, and/or their spills, as outlined in conservation measures **CM-3** and **CM-4** (Section 1.4.7). All fuels and other hazardous materials would be handled and stored according to the manufacturer's specifications. The construction equipment staging area would consist of bare ground enclosed by containment measures (e.g., berms or absorbent wattles) to limit the spread of any spills. Secondary containment methods would be used during all refueling activities, which would occur within the staging area whenever feasible. In the event of a spill, crew personnel would stop the spillage at its source, contain the spilled material, and notify Project supervisors and appropriate agency representatives.

The Project would have no potential impacts associated with hazardous material use following Project completion. With compliance with applicable regulations and incorporation of conservation measures **CM-3** and **CM-4** (Section 1.4.7), impacts related to the transport, use, or disposal of hazardous materials would be less than significant.

b) Would the Project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Implementation of hazardous material BMPs included in the SWPPP and outlined in conservation measures **CM-3** and **CM-4** (Section 1.4.7) would occur during Project implementation. Because these measures minimize the likelihood of reasonably foreseeable upset or accident conditions, and includes specific responses if such accidents might occur, the potential for the Project to create a significant hazard that could impact the public or environment would be less than significant.

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

The Project would not impact schools because no schools are currently located, or proposed to be constructed, within 0.25 mi of the Project Area. No impact would occur.

d) Would the Project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

No portion of the Project Area is included on a list of hazardous materials sites (CDTSC 2025). Therefore, the Project would not impact the public or environment by posing risk of exposure to hazardous materials pursuant to Government Code § 65962.5. No impact would occur.

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

No public-use airports are located within 2 mi of the Project Area. The Project would therefore have no impact.

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

In the event of an emergency, residents of Bouldin Island would evacuate the tract via routes that do not cross the Project Area; thus, emergency evacuation routes would not be affected by the Project. All roadway traffic supporting the Project would adhere to applicable laws for motor vehicles and with San Joaquin County's Office of Emergency Services. The construction contractor would comply with local fire, police, and medical responders during any emergency. Therefore, the Project would have no impact.

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

Bouldin Island has been designated by the California Department of Forestry and Fire Protection as an unzoned local responsibility area[10] with no moderate, high, or very high fire hazard severity zones (CalFire 2023). Accordingly, the Project would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires. In addition, **CM-5** (fire prevention measures; Section 1.4.7) would be implemented to reduce the potential for a grass fire. Therefore, the Project would have no impact related to wildland fires.

2.10 Hydrology and Water Quality

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	✓	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin?	☐	☐	☐	✓
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i) result in substantial erosion or siltation on- or off-site;	☐	☐	✓	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☐	✓
(iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☐	✓
(iv) impede or redirect flood flows?	☐	☐	☐	✓
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?	☐	☐	☐	✓

[10] Local responsibility areas are lands on which neither the state nor the federal government has any legal responsibility for providing fire protection.

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	✓

2.10.1 Environmental setting

Bouldin Island is surrounded by navigable waterways and encircled by a flood control levee maintained by the District. Waterways adjacent to Bouldin Island include the South Mokelumne River, Mokelumne River, Potato Slough, and Little Potato Slough (Figure 1-1). This area is within Hydrologic Unit Code 180400121106 (USGS 2020). Project activities along the levee would occur on the levee crown; the landside slope, which would be raised and widened with a 3H:1V slope to meet the Bulletin 192-82 design criteria; and the waterside slope, including a waterside bench of 20 ft within the existing levee footprint. A new pump station would also be constructed, necessitating 300 CY of in-water excavation occurring within the agricultural ditches in the interior of the island. The existing pump and pipes would be removed from the Project Area.

The Project Area experiences a Mediterranean climate characterized by hot, dry summers and cool, wet winters. Mean annual rainfall within the Project Area between 1981 and 2024 was 17 in (PRISM 2025). Rainfall typically occurs between October and April (PRISM 2021). Water levels in the adjacent waterways fluctuate daily with tidal action and episodically during flood events that typically occur in winter and spring. In this part of the Delta, water movement is bi-directional and influenced by westward river flow toward the Mokelumne-San Joaquin confluence, tidal action, and water-supply pumping at the State Water Project intakes in the south Delta. Bouldin Island is currently mapped within Federal Emergency Management Agency's 100-year recurrence floodplain designation (DWR 2025). There are no tsunami risks within the Project Area or vicinity according to the State of California's tsunami inundation map (State of California 2025).

Water quality objectives and beneficial uses for surface water and groundwater are included in the Water Quality Control Plan for the Central Valley (Basin Plan) (CVRWQCB 2019). The water quality objectives apply to all surface waters in the Sacramento and San Joaquin River basins within the Delta hydrologic unit, including the waterways surrounding Bouldin Island (i.e., South Mokelumne River, Mokelumne River, Potato Slough, and Little Potato Slough). Existing and potential beneficial uses for the Delta include municipal and domestic supply, agriculture supply (irrigation and stock watering), industry supply (process and service), recreation (contact and other noncontact), freshwater fish habitat (warm and cold), migration (warm and cold), spawning (warm), wildlife habitat, and navigation.

In accordance with Section 303(d) of the Clean Water Act, the 303(d) list was updated for 2020–2022 and showed a 30% net increase of waterbody-contaminant combinations in the Delta since the 2014–16 update (DSC 2023). The Delta waterways (central portion), including the waterways surrounding Bouldin Island, have been classified as *impaired* for metals (mercury), pesticides

(chlorpyrifos, dichlorodiphenyltrichloroethane [DDT], diazinon, group A pesticides), toxicity (unknown), and invasive aquatic species by the State Water Resources Control Board (SWRCB 2022). This designation, as specified in the Basin Plan, is assigned to water bodies where established water quality objectives are not being met or where beneficial uses are not protected. Classification of a water body as *impaired* on the 303(d) list triggers the development of a pollution control plan, called a Total Maximum Daily Load. The Total Maximum Daily Load for each water body and associated pollutant serves as the means to attain and maintain water quality standards for the *impaired* water body.

2.10.2 Findings

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

Ground disturbance during Project construction could temporarily increase the potential for localized erosion and sediment-laden stormwater runoff. A SWPPP with BMPs would be implemented to minimize the potential for soil erosion and stormwater runoff (conservation measure **CM-2**; Section 1.4.7) and for accidental spills of hazardous materials to enter waterways and groundwater (conservation measures **CM-3** and **CM-4**; Section 1.4.7). To reduce erosion upon completion of the levee construction, the landside slope would be hydroseeded with a native grass seed mix and the levee crown would be covered with compacted aggregate base placed along its surface to create an all-weather roadway. Water pumped from dewatered areas would be discharged into the surrounding fields or back into the District's drainage ditches that act as long line settling basins prior to being pumped through the existing pump station.. The borrow site has flat topography, and pump relocation would occur only within the existing drainage ditch. Excavation would therefore not affect drainage patterns or erosion in the surrounding areas.

Over the long term, the Project would reduce the potential for erosion and sediment-laden runoff through rehabilitation of the levee and toe berm, which would reduce flood risk and erosion susceptibility. The pump station relocation and extension of the associated piping would also improve system efficiency and reduce localized flooding. The new setback levee would be widened and raised with a 3H:1V landside slope to meet Bulletin 192-82 design criteria, decreasing susceptibility to erosion, seepage, and slope instability. With implementation of conservation measures **CM-2** through **CM-4**, impacts to surface water and groundwater quality would be less than significant.

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

The Project would not alter existing groundwater pumping rates or natural recharge potential on Bouldin Island. Therefore, the Project would have no impact.

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

i) result in a substantial erosion or siltation on- or off-site?

Movement of earth and fill material during Project construction would temporarily disturb soils and alter runoff patterns over a small area. Appropriate BMPs included in

the Project SWPPP would be implemented during construction to minimize potential temporary impacts to waters from erosion during Project construction (conservation measure **CM-2**; Section 1.4.7). To reduce erosion upon completion of the levee construction, the landside slope would be hydroseeded with a native grass seed mix, and the levee crown would be covered with a compacted aggregate base to create an all-weather roadway. The roadway would be constructed with approximately 3H:1V landside slope to minimize runoff into the adjacent waterway, meeting Bulletin 192-82 design criteria. The topography of the Project Area would be returned to existing grades and revegetated following Project construction, and no new impervious surfaces would be created. Therefore, there would be no substantial long-term change in erosion or siltation onsite or offsite. The Project would have a less than significant impact related to erosion and siltation.

ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?

The Project would not substantially alter drainage patterns following construction. Earth-moving activities during construction have the potential to cause minor and temporary alterations to existing drainage patterns within the Project Area but would not result in an increased risk of flooding. The Project would not result in flooding impacts to locations within the Project Area or offsite areas. Therefore, the Project would have no impact.

iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

The Project would not create or contribute runoff water or provide additional sources of polluted runoff because it does not add impervious surfaces and would maintain existing drainage patterns; all disturbed areas would be stabilized and revegetated. Appropriate BMPs included in the Project SWPPP would be implemented during construction to minimize potential temporary impacts to waters during Project construction (conservation measures **CM-2** through **CM-4**; Section 1.4.7), Additionally, the existing pump station and drainage system would continue to manage site runoff. Therefore, the Project would have no impact.

iv) impede or redirect flood flows?

Project construction would be completed during late summer or early fall when precipitation and flood risk are extremely low. Construction would occur on the land side of the levee and would not impede or redirect flows in adjacent waterways. Project implementation would not result in long-term changes to flood flow patterns. Therefore, the Project would have no impact.

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

The Project Area is not at risk of tsunamis due to its inland location in the Sacramento-San Joaquin Delta. Although seismically induced earth movements, seiches, and flooding are possible in the Delta, the Project would increase the ability of the levee to protect the interior of the island from such events. In the highly unlikely event of a flood or seiche during Project construction (see Section 2.10.1), implementation of hazardous material BMPs included in the SWPPP

(conservation measures **CM-3** and **CM-4**; Section 1.4.7) would minimize the risk of a pollutant release. The Project would not risk release of pollutants following Project construction. Therefore, the Project would have no impact.

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

The Project would not conflict with or obstruct the implementation of the Basin Plan (CVRWQCB 2019) or sustainable groundwater management plan. The Project is consistent with the Basin Plan because it incorporates measures to protect water quality and maintain identified beneficial uses. Additionally, the Project would implement a SWPPP (**CM-2** through **CM-4**; Section 1.4.7) with measures to protect water quality in adjacent waterways. The Project would not introduce new discharges, alter drainage patterns, or affect groundwater resources, and all work would comply with applicable water quality objectives. Therefore, the Project would have no impact.

2.11 Land Use and Planning

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Physically divide an established community?	☐	☐	☐	✓
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	✓	☐

2.11.1 Environmental setting

The land-use designation for Bouldin Island under the San Joaquin County General Plan is General Agriculture (AG-40) and is not included in a Williamson Act contract (City of Manteca 2024). Bouldin Island has about 5,000 acres of leased agricultural fields, typically used for corn, alfalfa, and sunflower (SWSD 2021). Additional detail regarding farmland designations on Bouldin Island is provided in Section 2.2.

Bouldin Island is also part of the Delta Primary Zone, as defined by the Delta Protection Act of 1992 (see Section 6.2). The Primary Zone includes approximately 500,000 acres of waterways, levees, and farmed lands throughout five counties (DPC 2010). The Land Use and Resource Management Plan for the Primary Zone of the Delta guides planning for the conservation and enhancement of the natural resources of the Delta, while sustaining agriculture and meeting increased recreational demand (DPC 2010).

Bouldin Island is located within the boundary covered by the Delta Plan (DSC 2013), a comprehensive, long-term management plan for the Delta and Suisun Marsh mandated by the

2009 Delta Reform Act (see Section 6.2). The Delta Reform Act also included the creation of the Delta Stewardship Council in 2010, the state agency responsible for developing and implementing the Delta Plan, which includes recommendations for achieving the coequal goals of protecting and enhancing the Delta ecosystem and its unique agricultural, cultural, and recreational characteristics, while providing for a more reliable water supply for California. Delta Plan Policy DP P2 reflects these goals by requiring that local land uses be considered when choosing placement of water or flood facilities or restoring habitats.

Additionally, the San Joaquin County General Plan (San Joaquin County 2016) includes the following goals and policies that are applicable to the Project as it pertains to land use:

> Goal LU 7: Provide for the long-term preservation of productive farmland and to accommodate agricultural services and related activities that support the continued viability of the County's agricultural industry.
>
> Policy LU 7.1 Protect Agricultural Land:
> The County will protect agricultural lands needed for the continuation of viable commercial agricultural production and other agricultural enterprises.

In January 2016, the County of San Joaquin adopted Interim Urgency Ordinance 4472, which provides, in relevant part:

> 9-605.7. PROHIBITED USES. All uses, including, but not limited to flooding inconsistent with generally accepted agricultural practices or which presents or could present a threat to the physical integrity of Delta levees, on land with a general plan designation of AG and located within the Primary Zone of the Sacramento-San Joaquin Delta are prohibited, except:
>
> a. Allowed uses as identified in Tables 9-605.2, 9-605.3 and 9-605.4 of the San Joaquin County Development Title;
> b. The Delta Wetlands Project as defined in the 2011 Delta Wetlands Project Place of Use Environmental Impact Report and reflected in the Protest Dismissal and Settlement Agreement reached in the matter of Central Delta Water Agency et al. v. Semitropic Water Storage District et al., San Francisco County Superior Court Case No. CPF-II-51175; and
> c. Easements obtained under the San Joaquin Multispecies Habitat Conservation Plan, but not greater than 80 cumulative acres by a single entity.

Interim Urgency Ordinance 4472 has since been codified under the Development Title of the San Joaquin County Code (San Joaquin County 2024).

2.11.2 Findings

a) Would the Project physically divide an established community?

The Project would not physically divide any established community because it occurs entirely within an existing levee footprint and nearby agricultural land, with no communities present in the Project Area. Therefore, the Project would have no impact.

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

The Project is not in conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect (e.g., conservation easement).

The western portion of the borrow site is unlikely to be returned to agricultural use following Project completion, resulting in the conversion of approximately 23 acres of agricultural land to wildlife habitat as described in Section 2.2.2. Despite this conversion, the Project aligns with San Joaquin County's goals and policies for agricultural land protection because rehabilitating the levee would reduce the risk of failure and prevent potential flooding across more than 5,500 acres of farmland on Bouldin Island.

Additionally, the Project is consistent with Interim Urgency Ordinance 4472, which permits the use of onsite borrow sites, including excavation reaching the water table, for levee maintenance projects conducted as part of routine Delta levee upkeep to protect agricultural lands from inundation due to levee overtopping or failure.

The Project also aligns with the Delta Plan, including Delta Plan Policy DP P2, by ensuring that flood control improvements protect existing and future land uses (e.g., agriculture, recreation) on Bouldin Island while contributing to a more reliable water supply for California. Therefore, the Project supports the co-equal goals of protecting and enhancing the Delta ecosystem and its unique agricultural, cultural, and recreational characteristics. For these reasons, the impact would be less than significant.

2.12 Mineral Resources

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	✓
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	✓

2.12.1 Environmental setting

Few mineral resources of economic value are present in the Delta. Extraction of peat and sand-gravel occurs on some Delta islands. No mineral extraction activities currently occur on Bouldin Island; however, the Project would extract fill material (i.e., surface mining) consisting of peat

and mineral soils from the borrow site (Figure 1-1). To date, land on Bouldin Island has not been classified into mineral resource zones, as pursuant to the California Surface Mining and Reclamation Act of 1975 (Section 6.2) (CGS 2019, 2025).

2.12.2 Findings

a) Would the Project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

No known mineral resources are present within the Project Area. Therefore, the Project would have no impact.

b) Would the Project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

No known mineral resources are present within the Project Area, and the Project would not conflict with any local plan. Therefore, the Project would have no impact.

2.13 Noise

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	✓
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	✓
c) For a Project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	✓

2.13.1 Environmental setting

Noise can be defined as unwanted or disruptive sound. Pressure waves traveling through air exert a force that is perceived by the human ear as sound, measured in decibels (dB) using monitoring instruments. For context, a whisper measures approximately 30 dB, normal speaking is about

60 dB, and shouting is around 110 dB (CDC 2022). Prolonged exposure to noises above 70 dB can lead to adverse effects, such as hearing loss. Noise levels from localized (i.e., point) sources attenuate with distance at a rate of approximately 6 dB per doubling of distance (FTA 2018).

Ambient noise in the Project Area vicinity is primarily created by boat traffic along adjacent waterways, vehicular traffic on State Route 12, and routine agricultural and maintenance activities on Bouldin Island. The nearest noise-sensitive receptors to the Project Area are the Willow Berm Marina, located across the Mokelumne River about 0.3 mi from the Project Area; several mobile home parks across the Mokelumne River, ranging from 0.2 to 0.6 mi from the Project Area; and the four rural residences on the northern end of Bouldin Island, all further than 1 mi from the Project Area. Other rural residences in the vicinity are greater than 1 mi from the Project Area.

Noise levels for heavy equipment and loaded haul trucks to be used during Project construction would be expected to reach approximately 95 dBA at 50 feet or about 62 dBA at 0.2 mile from the source (i.e., the distance to the nearest sensitive receptor) (FHWA 2017). Because a portion of the Project's pile driving would occur in the Mokelumne River, airborne sound may propagate more efficiently across the water surface than across adjacent land. However, the San Joaquin County Development Title (Section 9-404) states that noise generated from construction activities are exempt from noise level regulations, provided the work takes place between 6:00 a.m. and 9:00 p.m. on any day.

2.13.1.1 Vibration

Vibrations are periodic oscillations of a medium, including groundborne vibrations generated by machinery or construction equipment. These vibrations can lead to groundborne noise, which occurs when objects such as room surfaces resonate in response to ground vibrations. Vibrations are typically measured by their root mean squared velocity, expressed in vibration decibels (VdB). Vibrations become perceptible at approximately 65 VdB, distinctly perceptible around 75 VdB, and become bothersome around 85 VdB (FTA 2018).

Existing vibration levels are relatively low near the Project Area. Vibrations in the vicinity are primarily produced by routine agricultural and maintenance vehicles and equipment, as well as vehicular traffic along State Route 12; however, it is unusual for vibration from trucks or from traffic on smooth roads like State Route 12 to be perceptible, even at adjacent properties (FTA 2018).

Vibration levels for heavy equipment and loaded haul trucks to be used during Project construction are expected to reach up to 112 VdB, 25 ft from the source (FTA 2018). Vibrations would be highest during pump station removal, when sheet piles would be driven using vibratory or impact hammers. The San Joaquin County Development Title (Section 9-1025.5(c)) states that vibration sources associated with construction or demolition of structures or infrastructure are exempt from vibration level regulations.

2.13.2 Findings

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

San Joaquin County Development Title (Chapter 9-404) provides an exemption for construction activities from standard noise level restrictions, provided that such activities occur between 6:00 a.m. and 9:00 p.m. Project construction activities would take place between 6:00 a.m. and 6:00 p.m. (Section 1.4.6). Therefore, the Project would have no impact.

b) Would the Project result in generation of excessive groundborne vibration or groundborne noise levels?

The nearest noise-sensitive receptors to the Project Area are the Willow Berm Marina, located across the Mokelumne River about 0.3 mi from the Project Area; several mobile home parks across the Mokelumne River, ranging from 0.2 to 0.6 mi from the Project Area; and the four rural residences on the northern end Bouldin Island, all farther than 1 mi away from the Project Area.

Vibrations first become perceptible at approximately 65 VdB (FTA 2018). Vibration levels for heavy equipment and loaded haul trucks to be used during Project construction are not expected to exceed 63 VdB 0.2 mi from the source (i.e., the distance to the nearest noise-sensitive receptor) (FTA 2018). No equipment used during Project construction is expected to have detectable vibrations at surrounding land uses, including the nearest sensitive receptor. Vibrations would be highest during pump station removal, when sheet piles would be driven using vibratory or impact hammers, but impacts would be temporary. Noise levels are expected to reach up to 62 dBA at the nearest sensitive receptor during pile driving (FHWA 2017).

Vibration and noise produced by Project construction activities during daytime hours are also exempt from San Joaquin County regulations, and operational vibration or noise levels would not increase following Project construction. No long-term increase in groundborne vibration generation would occur following Project construction. For these reasons, the Project would not result in generation of excessive groundborne vibration. Therefore, the Project would have no impact.

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

The Project is not located within the vicinity of a private airstrip or within 2 mi of a public airport or public use airport. Therefore, the Project would have no impact.

2.14 Population and Housing

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	✓
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	✓

2.14.1 Environmental setting

The Project Area is located in a rural region of San Joaquin County with a low population density. The nearest town is Terminous, located across Little Potato Slough, with a population of 357 as of 2023. The surrounding landscape is primarily agricultural. Nearby residential uses include the Willow Berm Marina, approximately 0.3 mi across the Mokelumne River from the Project Area; several mobile home parks on the opposite side of the river, located between 0.2 and 0.6 mi away from the Project Area; and four rural residences at the northern end of Bouldin Island, all farther away than 1 mi from the Project Area.

2.14.2 Findings

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

Although the levee rehabilitation is an infrastructure improvement, this Project does not include any elements that would induce population growth. Therefore, the Project would have no impact.

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

The Project would not displace any existing housing or necessitate the construction of replacement housing elsewhere. Therefore, the Project would have no impact.

2.15 Public Services

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
1. Would the Project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:	☐	☐	☐	✓
Fire protection?	☐	☐	☐	✓
Police protection?	☐	☐	☐	✓
Schools?	☐	☐	☐	✓
Parks?	☐	☐	☐	✓
Other public facilities?	☐	☐	☐	✓

2.15.1 Environmental setting

Bouldin Island is owned by the Metropolitan Water District of Southern California, and its levees are maintained by Reclamation District No. 756. The island is managed for agriculture, and no government facilities, public resources, or services are located on the island.

2.15.2 Findings

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

The Project would not affect public services including fire protection, police protection, schools, parks, or other public facilities. None of these services currently exist on Bouldin Island, and access routes would be maintained to allow fire and police protection services to reach residences near the Project Area. Therefore, the Project would have no impact.

2.16 Recreation

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	✓
b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	✓

2.16.1 Environmental setting

The Delta waterways surrounding Bouldin Island are a recreational resource for boating, fishing, wildlife viewing, and hunting. Bouldin Island is owned by the Metropolitan Water District of Southern California, and although local homeowners use the island for private access to surrounding waterways, it is not specifically designated by San Joaquin County for recreational use.

2.16.2 Findings

a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

The Project would not change the current use of waterways or recreational facilities near Bouldin Island. Therefore, the Project would have no impact.

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

The Project does not include public recreational facilities or require the construction or expansion of recreational facilities. Therefore, the Project would have no impact.

2.17 Transportation

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	☐	☐	☐	✓
b) Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?	☐	☐	☐	✓
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	✓
d) Result in inadequate emergency access?	☐	☐	☐	✓

2.17.1 Environmental setting

The Project Area is accessible from State Route 12, which runs east–west across Bouldin Island. The existing levee also has a road along its crown that is used for levee maintenance, and this road would be restored on the crown of the rehabilitated levee. During construction, workers would use State Route 12 and private roads within Bouldin Island to access the work site. Haul routes would be restricted to existing roads. The Project would not use adjacent waterways for construction access or navigation. The Project would temporarily increase traffic in the vicinity of the Project during construction but would not result in long-term changes to any traffic or transportation circulation system.

2.17.2 Findings

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

There is no specific circulation or transit program, plan, ordinance, or policy for Bouldin Island. The island is primarily agricultural and accessed via State Route 12, which serves as the main transportation corridor. There are no public transit services, bicycle facilities, or pedestrian infrastructure beyond private farm and levee maintenance roads. Broader planning documents, such as the San Joaquin County General Plan and the Delta Plan, provide regional land use and resource management guidance but do not include circulation or transit-specific policies for Bouldin Island. Therefore, the Project would not conflict with any adopted circulation or transit plan. There would be no impact.

b) Would the Project conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?

Construction would not require roadway closures or detours and would not affect passenger vehicle travel patterns. The Project would not generate new passenger vehicle trips or change land uses or circulation during operation. Therefore, the Project would not increase VMT and would be consistent with CEQA Guidelines § 15064.3(b). There would be no impact.

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

The design features of the improved levee road would be similar to the existing road and would be compatible with existing uses of the island. There would be no impact.

d) Would the Project result in inadequate emergency access?

Emergency services would continue to have access to Bouldin Island via State Route 12 throughout Project construction. Levee roads are typically gated and not used for routine emergency access; however, they could be made available if needed during an emergency on Bouldin Island. Project personnel, including haul truck drivers and equipment operators, would comply with local fire, police, and medical responders during any emergency. Additionally, the improvements to the Project's levee would reduce the likelihood of a catastrophic flood or levee breach that could potentially impact emergency access to areas accessed via State Route 12. The Project would not result in inadequate emergency access. There would be no impact.

2.18 Tribal Cultural Resources

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
a) Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	☐	☐	☐	✓
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code § 5020.1(k), or	☐	☐	☐	✓

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☐	✓

2.18.1 Environmental setting

Natural Investigations conducted cultural resources investigations for the Project Area. The study is documented in a report titled *Cultural Resources Assessment for the Reclamation District No. 756: Bouldin Island Multi-Benefit Levee Setback Project, San Joaquin County, California* (Natural Investigations 2025) which includes a records search of the CHRIS conducted by the CCIC, located on the campus of California State University, Stanislaus; an SLF search conducted by the NAHC; geoarchaeological sensitivity analyses; and a pedestrian survey of the Project Area. The cultural resources report includes detailed precontact, ethnographic, and historic information for the Project Area.

The Project Area is in the ethnographic territory of the Eastern Miwok and lies near the traditional homelands of the Southern Wintun or Patwin to the north and the Northern Valley Yokuts to the south. The Eastern Miwok are divided into several different regional groups, including the Bay, Coast, Lake, Plains, and Sierra Miwok (Levy 1978). The Project Area falls primarily in the territory of the Plains Miwok. Several ethnographic village sites, including Tanquimne, Locolomne, Musupumne, and Seqamne, are located along the Mokelumne River in proximity to the Project Area (Levy 1978).

Many Tribes, regardless of federal recognition status, maintain enduring traditional and cultural affiliations with the Project Area and its surrounding lands. These communities have deep spiritual, cultural, and physical connections to their ancestral lands and continue to serve as contemporary stewards of their heritage and landscapes. Tribal presence remains rooted in these homelands, embodying the resilience and continuity of their ancestors through sustained relationships with sacred sites, cultural practices, and history. Each tribe is committed to preserving and revitalizing its cultural legacy for present and future generations by continuing to live and thrive throughout the San Francisco Bay Area, affirming their presence and cultural vitality in the region today.

2.18.1.1 Results of Tribal Resources investigation

The CCIC records search (No.: 13387L) identified three previously recorded cultural resources, P-39-000031 (a pump house foundation), P-39-005454 (a levee), and P-39-005483 (irrigation ditches), in the Project Area. The NAHC search of the SLF was negative. In response to the Native American outreach letter, Natural Investigations received emails from the Wilton Rancheria and Lucy Beyhan, Cultural Resource Manager II of the Confederated Villages of Lisjan Nation, requesting formal consultation. However, neither Wilton Rancheria nor Ms. Beyhan identified any culturally sensitive resources in the Project area. The general proposed Project vicinity is sensitive for buried deposits of cultural resources, but the Project Area exhibits a low sensitivity for buried cultural resources because it primarily includes previously disturbed contexts consisting of fill and landforms such as marshes, sloughs, and river channels that are not optimal settings for precontact or historic occupation sites. Pedestrian surface survey of the entire Project Area identified the three previously recorded historic cultural resources, P-39-000031, P-39-005454, and P-39-005483, but did not identify any new cultural resources or any indication of buried deposits of cultural resources in the Project Area.

Sites P-39-005454 and P-39-005483 were previously recommended not eligible for the NRHP or CRHR. Natural Investigations concurs with the previous NRHP and CRHR determinations for these two sites and also determined that site P-39-000031 is not eligible for the NRHP/CRHR.

In summary, cultural resources investigations for the proposed project identified three historic sites, P-39-000031, P-39-005454, and P-39-005483, that do not appear to meet the criteria for inclusion on the NRHP/CRHR. Cultural resources investigations (i.e., archival research, pedestrian survey, and Native American outreach) did not identify any indigenous resources or tribal cultural resources pursuant to PRC Section 21074 in the Project Area.

2.18.2 Findings

a) Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code § 5020.1(k), or

ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Cultural resources investigations for the Project did not identify any indigenous cultural resources in the Project Area and Native American outreach did not identify any culturally sensitive resources in it. Therefore, the Project would not impact any tribal cultural resources.

2.19 Utilities and Service Systems

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
Would the Project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment, or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☐	✓
b) Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☐	☐	☐	✓
c) Result in a determination by the wastewater treatment provider, which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	✓
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	✓	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	✓

2.19.1 Environmental setting

No public wastewater treatment facilities, stormwater drainage facilities, or other public utilities or service systems are located on Bouldin Island. Wastewater is managed by private septic systems. Solid waste can be disposed of at landfills and recycling facilities in nearby cities (e.g., Lodi, Stockton). Pacific Gas and Electric Company provides electricity to Bouldin Island via local distribution lines.

The San Joaquin County General Plan includes goals to reduce solid waste totals 75% from 1990 levels by 2020 and 90% by 2035 (San Joaquin County 2016). To achieve these goals, San Joaquin County Ordinance 4370 requires applicable projects to divert 50% of construction and demolition debris and 90% of inert and organic materials from the landfill through reuse and recycling.

2.19.2 Findings

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

The Project would not require or result in relocation, construction, or expansion of facilities including water, wastewater treatment, stormwater drainage, power, gas, or telecommunications facilities. There would be no impact.

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

The Project would use water trucks for dust control (see Section 1.4.7). Sufficient water for dust control is expected to be available onsite (e.g., pumped from the borrow site) during construction. The Project would not result in a need for increased water supply for continued agricultural operations. There would be no impact.

c) Would the Project result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?

The Project would not create a need for increased wastewater treatment capacity, and no wastewater treatment facilities exist on Bouldin Island. There would be no impact.

d) Would the Project generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Fill and aggregate base removed during levee excavation would not be salvaged. Ruderal vegetation would be stripped, stockpiled beyond the work area, and respread over the levee when earthwork is completed. Woody debris would be disposed of at an offsite waste facility. All materials from the existing pump station would become property of the contractor and disposed of offsite in compliance with applicable local, state, and federal laws. Project activities would comply with California's solid-waste reduction mandates under AB 939 and AB 341, which establish statewide diversion goals to reduce landfill reliance. The Project would also adhere to San Joaquin County Ordinance 4370, which requires the diversion of 50% of construction and demolition debris and 90% of inert and organic material. Therefore, solid waste generated during the construction phase would not exceed local or state standards, overwhelm local infrastructure, or impair the attainment of solid waste reduction goals. The impact would be less than significant.

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

As indicated in item d above, the Project would comply with state and local solid-waste reduction mandates, including AB 939, AB 341, and San Joaquin County Ordinance 4370. The Project would also comply with federal solid-waste reduction mandates, such as the Resource Conservation and Recovery Act (RCRA), which establishes federal requirements for the proper handling and disposal of solid waste. There would be no impact.

2.20 Wildfire

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

2.20.1 Environmental setting

Within San Joaquin County, the highest wildfire risk is in the southern portion of the county where foothill or mountain areas have potentially large fuel loads. The Project Area has generally flat topography and primarily includes agricultural land surrounded by waterways. The Project Area is in an un-zoned state responsibility area and does not contain lands classified as moderate, high, or very high fire hazard severity zones (CalFire 2023).

2.20.2 Findings

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

The Project Area is not located within or near a state responsibility area or on land classified as a very high fire hazard severity zone. State Route 12 through Bouldin Island is not designated by San Joaquin County for emergency evacuation (San Joaquin County 2019). There would be no impact.

b) If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

The Project is not located within or near a state responsibility area or on land classified as a very high fire hazard severity zone. The Project does not include any components that would exacerbate wildfire risk. There would be no impact.

c) If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

The Project is not located within or near a state responsibility area or on land classified as a very high fire hazard severity zone and does not require the installation of associated infrastructure. There would be no impact.

d) If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

The Project is not located within or near a state responsibility area or on land classified as a very high fire hazard severity zone. The topography within the Project Area is generally flat and would not result in increased runoff or slope instability, and the levee rehabilitation would provide increased flood protection to Bouldin Island. There would be no impact.

2.21 Mandatory Findings of Significance

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

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

As discussed in Section 2.4, the Project has the potential to impact special-status plant and wildlife species as well as their habitats within the Project Area. Impacts to these resources would be limited to a less than significant level with the incorporation of mitigation measures **MM-1** through **MM-11.**

As discussed in Sections 2.5, the potential for cultural resources to be impacted by the Project is low; however, conservation measure **CM-6** and mitigation measure **MM-12** describe procedures for an unanticipated discovery of human remains or cultural resources or during the excavation.

Therefore, the Project would not substantially degrade the quality of the environment, substantially reduce the habitat of a wildlife species, cause a wildlife population to drop below

self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory. Potential impacts to biological and cultural resources would be less than significant with incorporation of the mitigation measures described above.

b) Does the Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a Project are considerable when viewed in connection with the effects of past Projects, the effects of other current Projects, and the effects of probable future Projects.)

The Project has been determined to have no impact on mineral resources, noise, population and housing, public services, recreation, transportation, tribal cultural resources, and wildfire. Because the Project would not affect these resources, it would not contribute any incremental effects that could combine with past, present, or reasonably foreseeable future projects. As a result, there is no potential for cumulatively considerable impacts to these resource areas.

The Project has been determined to have the potential for less-than-significant impacts to aesthetics, agriculture and forestry resources, air quality, energy, geology and soils, GHG emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, and utilities and service systems. These impacts would occur temporarily during construction and would not meaningfully contribute to cumulative conditions in the Delta. Additionally, the Project does not exceed applicable SJVAPCD air quality and GHG thresholds, which are designed to identify emissions that would contribute to cumulative air-quality degradation within the San Joaquin Valley Air Basin. The potential for cumulatively considerable hydrology and water quality impacts would be minimized by implementation of a SWPPP during construction (**CM-2** through **CM-4**; Section 1.4.7). As described in (a) above, implementation of conservation measure **CM-6** and mitigation measures **MM-1** through **MM-12** during construction (e.g., preconstruction surveys) would prevent impacts to biological and cultural resources that have the potential to be cumulatively considerable.

Another levee rehabilitation Project is planned on Bouldin Island, with construction occurring in either 2026 or 2027; however, it would occur on a different levee segment and would not overlap in time or location with the proposed Project. As such, the proposed Project's temporary and mitigated construction effects would not combine with those of the separate levee rehabilitation effort to produce cumulatively considerable impacts.

For the reasons described above, the Project would not have environmental impacts that are individually limited but cumulatively considerable; cumulative impacts would be less than significant with mitigation.

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

As discussed in this IS/MND, the Project, including conservation and mitigation measures that are incorporated into its design, would have no impact or a less-than-significant impact on aesthetics, agriculture, air quality, cultural resources, energy, geology and soils, GHG emissions, hazards or hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation, tribal cultural resources, utilities and services, and wildfire. As such, the Project's environmental impacts would

not cause substantial, adverse impacts to humans, either directly or indirectly; impacts would be less than significant with mitigation.

3 DETERMINATION

On the basis of this evaluation:

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

4 LIST OF PREPARERS

The table below lists the preparers of this IS/MND and participants in the related planning, data gathering, and analytical tasks.

Name	Title	Affiliation	Project role
Tina Anderson	Senior Project Manager	MBK Engineers	Project management and support
Alli Hauger	Project Engineer	MBK Engineers	Engineering, Project design
Michael Kynett	Supervising Engineer	MBK Engineers	Engineering, Project design
Nathan Hershey	Principal Engineer	MBK Engineers	Engineering, Project design
Rob Thoms	Botanist/ Plant Ecologist	Stillwater Sciences	Project Manager
Cooper Walton	Wildlife Biologist	Stillwater Sciences	Deputy Project Manager
Kayla Fitzpatrick	Environmental Scientist	Stillwater Sciences	Environmental Analysis
Skylar Rousseau	Fisheries Biologist	Stillwater Sciences	Fish Section Author
Joelle Canto-Adams	Botanist	Stillwater Sciences	Botanical Section Author
Shayda Abidi	Wildlife/Fisheries Biologist	Stillwater Sciences	Wildlife Section Author
Krista Orr	Senior Ecologist	Stillwater Sciences	Wildlife Senior Editor
AJ Keith	Senior Aquatic Ecologist	Stillwater Sciences	Fisheries Senior Editor
Christine Champe	Senior Wildlife Biologist	Stillwater Sciences	Senior Editor
Coreen Johnson	Senior Technical Editor	Stillwater Sciences	Technical Editor
Kelli Wheat Dawson	Document Production	Stillwater Sciences	Formatting
Anne Maher	Environmental Scientist	Stillwater Sciences	Wetland Section Author
John A. Nadolski	Archaeologist	Natural Investigations Company	Cultural resources, tribal cultural resources
Dylan Stapleton	Archaeologist	Natural Investigations Company	Cultural resources, tribal cultural resources

5 CONSULTATION AND COORDINATION

The Draft IS/MND was circulated to agencies, individuals, and/or organizations known to have a special interest in the proposed Project and was made available to the public for a xx-day review period. The public was notified as follows:

- A Notice of Intent (NOI) to adopt an MND was posted for publication in a local newspaper and filed with _____.
- The proposed IS/MND, NOI, and Notice of Completion (NOC), were electronically submitted to the State Clearinghouse via the CEQAnet Web Portal for distribution.
- The proposed IS/MND was distributed electronically by the State Clearinghouse to interested parties.
- Copies of the proposed IS/MND were made available for public review at _____.

6 COMPLIANCE WITH FEDERAL AND STATE ENVIRONMENTAL LAWS AND REGULATIONS

6.1 Federal

Clean Air Act. Section 176(c) of this act prohibits federal action or support of activities that do not conform to a State Implementation Plan. The Project is not expected to violate any air quality standard, increase air quality violations in the Project region, exceed the U.S. Environmental Protection Agency's general conformity *de minimis* threshold, or hinder the attainment of air quality objectives in the local air basin. The Project would have no adverse effect on the future air quality of the Project Area and is compliant with this act.

Clean Water Act (Sections 401 and 404). Section 404 of this act requires that prior to Project implementation, a permit be obtained from the USACE for fill of Waters of the United States, including wetlands. In compliance with Section 401 of the act, a water quality certification or a waiver of water quality certification needs to be obtained from the Central Valley Regional Water Quality Control Board. Due to the required fill within Waters of the United States (as footings for the pipe replacements), Section 404 and 401 permits would be secured prior to Project implementation, in compliance with this act.

Endangered Species Act. The ESA prohibits unauthorized take of species listed or proposed for listing as threatened or endangered. The ESA also ensures that the actions of federal agencies do not jeopardize the continued existence of threatened and endangered species. The mitigation measures incorporated into the Project would ensure compliance with the ESA.

Migratory Bird Treaty Act. Protection of migratory birds, their occupied nests, and their eggs is required by the MBTA (16 United States Code 703 et seq.), Title 50 CFR Part 10. The full list of the species protected under the MBTA appears in Title 50 CFR Section 10.13 and includes federally and state-listed migratory birds as well as other non-listed migratory birds. Mitigation measures incorporated into the Project would ensure compliance with the MBTA.

Resource Conservation and Recovery Act. The Resource Conservation and Recovery Act (RCRA) grants EPA the authority to control hazardous waste from cradle to grave. This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA framework ensures that hazardous materials are managed to prevent environmental contamination. All waste generated by Project activities would be managed in compliance with RCRA requirements.

Rivers and Harbors Act (Sections 10 and 14 [codified in Section 408]). The Rivers and Harbors Act prohibits the unauthorized obstruction of any navigable Water of the United States. All features below mean high water are subject to Section 10 of the Rivers and Harbors Act, which requires authorization for the construction of any structure in or over navigable waters. The Mokelumne River is considered a TNW by USACE. Section 14 of the Rivers and Harbors Act (codified in and commonly referred to as Section 408) regulates permanent or temporary modifications to USACE public works projects, including federal levees. The Project would not require a Section 10 permit because it would not obstruct a TNW. Additionally, the Project's levee does not fall under federal jurisdiction and would therefore not require a Section 408 Permission Letter from the USACE.

6.2 State

Assembly Bills 32 and 1279. AB 32 required the California Air Resources Board to develop regulations to address global climate change due to GHG emissions. The bill also required attainment of a statewide GHG emissions limit, equal to the 1990 level, by December 31, 2020. As of 2019, statewide GHG emissions (418.4 $MMTCO_2e$) (CARB 2021) were below the 2020 GHG emissions limit (431 $MMTCO_2e$) (CARB 2018). Signed into law in 2022, AB 1279 expanded upon AB 32 by specifying an emissions limit that further requires California to reduce statewide GHG emissions to 85% below the 1990s level by 2045. Emissions associated with Project construction would be temporary and would not inhibit attainment of the statewide GHG emissions limits established by these bills.

Assembly Bill 52. AB 52 provides a method for incorporation of Native American tribal knowledge into the CEQA review process via formal consultation. In compliance with AB 52, tribal members or organizations, provided by the Native American Heritage Commission, were contacted for information on the potential for indigenous resources within or near the Project Area. Results of tribal outreach efforts undertaken in support of the Project gave no indication that tribal cultural resources are present within the Project Area.

Assembly Bill 341. AB 341 established regulations requiring commercial business and multi-family residences to implement recycling programs. AB 341 also updated the statewide goal from AB 939 (see Integrated Waste Management Act below) from a 50% reduction in solid waste disposal to a 75% reduction by 2020. The Project would reuse or recycle materials where feasible and would only generate solid waste over the short-term during Project construction, so it would not impair the attainment of solid waste reduction goals.

California Endangered Species Act. Generally, CDFW administers the state laws providing protection of fish and wildlife resources, including the California ESA. The California ESA parallels the federal ESA and was written to protect state endangered and threatened species. Mitigation measures incorporated into the Project would ensure compliance with the California ESA.

California Environmental Quality Act. This IS/MND has been prepared to comply with CEQA.

California Fish and Game Code Section 1600 et seq. California Fish and Game Code Section 1600 et seq. gives authority to CDFW to regulate activities that would interfere with the natural flow of, or substantially alter, the channel, bed, or bank of a lake, river, or stream. Because the Project would include work on the waterside levee below the hinge point or waterside crest, the District is required to notify CDFW. If CDFW were to determine that the Project would have potential adverse effects on fish and wildlife resources, it would issue a Lake and Streambed Alteration Agreement that would include conditions to protect these resources. The Project would therefore comply with this Fish and Game Code section.

California Fish and Game Code Sections 86, 3503, and 3513. California Fish and Game Code Section 86 defines take as hunting, pursuing, catching, capturing, or killing, or attempting to hunt, pursue, catch, capture, or kill. Under Section 3503, it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as otherwise provided. Section 3503.5 protects all birds-of-prey (raptors) and their eggs and nests, and Section 3513 makes it is unlawful to take or possess any migratory non-game bird designated under the MBTA. Mitigation measures incorporated into the Project would ensure compliance with these Fish and Game Code sections.

California Fish and Game Code Sections 3511, 4700, 5050, and 5515. California Fish and Game Code Sections 3511, 4700, 5050, and 5515 designated rare fish and wildlife species as Fully Protected in California. This designation provides additional protection to these species from unauthorized take or possession. Mitigation measures incorporated into the Project would ensure compliance with these Fish and Game Code sections.

California Health and Safety Code Section 7050.5, PRC Section 5097.98. California Public Resources Code § 5097.98 mandates that if Native American human remains are discovered, the landowner must stop work and coordinate with the Most Likely Descendants (MLD) identified by the Native American Heritage Commission (NAHC) to determine treatment or disposition. Whenever the NAHC is unable to identify a descendant, or the descendants identified fail to make a recommendation, or the landowner or his or her authorized representative rejects the recommendation of the descendants and the mediation provided for in subdivision (k) of Section 5097.94, if invoked, fails to provide measures acceptable to the landowner, the landowner or his or her authorized representative shall reinter the human remains and items associated with Native American human remains with appropriate dignity on the property in a location not subject to further and future subsurface disturbance. Conservation measure **CM-6** would ensure Project compliance with this statute.

Delta Protection Act. The Delta Protection Act was established in recognition of the increasing threats to the resources of the Primary Zone of the Delta from urban and suburban encroachment and their potential to impact agriculture, wildlife habitat, and recreational uses. Pursuant to this act, the Land Use and Resource Management Plan for the Primary Zone of the Delta was completed and adopted by the Delta Protection Commission in 1995 (updated in 2002). The Project would not result in urban or suburban encroachment and would, therefore, be in compliance with this act.

Delta Reform Act. The Delta Reform Act created the Delta Stewardship Council to oversee the management of water and environmental resources in the Delta through the development and implementation of the Delta Plan. If it were to be determined that the Project is a covered action, a consistency determination would be obtained from the Delta Stewardship Council.

Integrated Waste Management Act (AB 939). The Integrated Waste Management Act made California cities and counties responsible for enacting plans to divert 25% of solid waste by 1995 and 50% by 2000. The Project would reuse or recycle materials where feasible and would only generate solid waste over the short-term during Project construction so would not impair the attainment of solid waste reduction goals.

Native Plant Protection Act. This act directed CDFW to preserve, protect, and enhance native plants. It gave CDFW the authority to designate native plants as endangered or rare and require that landowners who have been notified of state-listed species on their property, and who wish to destroy those plants and their habitat, to provide CDFW with notice to salvage the plants no less than 10 days before destruction occurs. Many of the species designated under the act were subsumed by the California ESA, but there is a subset of species, subspecies, and varieties of plants that were not and are protected as rare under the act. Mitigation measures that are incorporated into the Project would ensure compliance with this act.

Porter-Cologne Water Quality Control Act. This act was established to protect water quality and beneficial uses of water in California. It requires that National Pollutant Discharge Elimination System and Waste Discharge Requirement permits for point and nonpoint source

discharges, respectively, be obtained from the Central Valley Regional Water Quality Control Board to protect water quality in surface waters, groundwater, and wetlands. If it were to be determined that the Project may impact Waters of the United States, then National Pollutant Discharge Elimination System and Waste Discharge Requirement permits would be secured prior to Project implementation, in compliance with this act.

Surface Mining and Reclamation Act. This act includes policies for the regulation of surface mining operations to balance production of state mineral resources with minimization of adverse environmental impacts associated with these activities. In support of these goals, state lands are classified into mineral resource zones based on known or inferred mineral resources. No land on Bouldin Island has been classified into mineral resource zones, so the Project would not conflict with the policies in this act.

Warren-Alquist Act. This act established the California Energy Commission, the state's primary energy policy and planning agency. The California Energy Commission works to advance state energy policy, encourage energy efficiency, and develop renewable energy. The Project would only use fossil fuels on a short-term basis during construction activities and would include BMPs for energy conservation (e.g., limiting idling time, properly maintaining equipment).

Williamson Act (also known as the California Land Conservation Act). This act allows for the formation of contracts between local governments and private landowners to restrict use of specific parcels to agricultural or related open space land uses. The Project Area is covered by a Williamson Act contract, and land use within the Project Area would not change over the long-term following Project construction.

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Appendices

Appendix A
Road Construction Emissions Model Data Entry and Emissions Summary Sheets

Bouldin Island Summary Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Bouldin Island
Construction Start Date	5/31/2025
Lead Agency	Reclamation District No. 756
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.40
Precipitation (days)	31.2
Location	38.10203, -121.559945
County	San Joaquin
City	Unincorporated
Air District	San Joaquin Valley APCD
Air Basin	San Joaquin Valley
TAZ	2118
EDFZ	4
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.29

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description

User Defined Linear	0.18	Mile	0.00	0.00	—	—	—	Total extent of levee rehabilitation area, haul route, borrow site, and access road.

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-9	Use Dust Suppressants
Construction	C-10-A	Water Exposed Surfaces
Construction	C-11	Limit Vehicle Speeds on Unpaved Roads

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

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

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	11.0	9.16	80.6	81.7	0.18	2.83	56.7	59.5	2.60	11.2	13.8	—	18,081	18,081	0.69	0.50	6.01	18,254
Mit.	11.0	9.16	80.6	81.7	0.18	2.83	19.9	22.7	2.60	4.22	6.82	—	18,081	18,081	0.69	0.50	6.01	18,254
% Reduced	—	—	—	—	—	—	65%	62%	—	62%	51%	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	11.0	9.14	80.8	81.7	0.18	2.83	56.7	59.5	2.60	11.2	13.8	—	18,077	18,077	0.69	0.50	0.16	18,245
Mit.	11.0	9.14	80.8	81.7	0.18	2.83	19.9	22.7	2.60	4.22	6.82	—	18,077	18,077	0.69	0.50	0.16	18,245
% Reduced	—	—	—	—	—	—	65%	62%	—	62%	51%	—	—	—	—	—	—	—

Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.16	2.63	23.1	23.4	0.05	0.82	15.0	15.8	0.75	3.16	3.92	—	5,190	5,190	0.20	0.14	0.71	5,237
Mit.	3.16	2.63	23.1	23.4	0.05	0.82	5.30	6.12	0.75	1.20	1.95	—	5,190	5,190	0.20	0.14	0.71	5,237
% Reduced	—	—	—	—	—	—	65%	61%	—	62%	50%	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.58	0.48	4.22	4.27	0.01	0.15	2.73	2.88	0.14	0.58	0.71	—	859	859	0.03	0.02	0.12	867
Mit.	0.58	0.48	4.22	4.27	0.01	0.15	0.97	1.12	0.14	0.22	0.36	—	859	859	0.03	0.02	0.12	867
% Reduced	—	—	—	—	—	—	65%	61%	—	62%	50%	—	—	—	—	—	—	—

6. Climate Risk Detailed Report

6.2. Initial Climate Risk Scores

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

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

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

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

7. Health and Equity Details

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	81.0
Healthy Places Index Score for Project Location (b)	39.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

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

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

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3.5. Setback levee and pump station construction (2026) (2026) - Unmitigated

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4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

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6. Climate Risk Detailed Report

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7.6. Health & Equity Custom Measures

8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Bouldin Island
Construction Start Date	5/31/2025
Lead Agency	Reclamation District No. 756
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.40
Precipitation (days)	31.2
Location	38.10203, -121.559945
County	San Joaquin
City	Unincorporated
Air District	San Joaquin Valley APCD
Air Basin	San Joaquin Valley
TAZ	2118
EDFZ	4
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.29

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description

User Defined Linear	0.18	Mile	0.00	0.00	—	—	—	Total extent of levee rehabilitation area, haul route, borrow site, and access road.

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-9	Use Dust Suppressants
Construction	C-10-A	Water Exposed Surfaces
Construction	C-11	Limit Vehicle Speeds on Unpaved Roads

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

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

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	11.0	9.16	80.6	81.7	0.18	2.83	56.7	59.5	2.60	11.2	13.8	—	18,081	18,081	0.69	0.50	6.01	18,254
Mit.	11.0	9.16	80.6	81.7	0.18	2.83	19.9	22.7	2.60	4.22	6.82	—	18,081	18,081	0.69	0.50	6.01	18,254
% Reduced	—	—	—	—	—	—	65%	62%	—	62%	51%	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	11.0	9.14	80.8	81.7	0.18	2.83	56.7	59.5	2.60	11.2	13.8	—	18,077	18,077	0.69	0.50	0.16	18,245
Mit.	11.0	9.14	80.8	81.7	0.18	2.83	19.9	22.7	2.60	4.22	6.82	—	18,077	18,077	0.69	0.50	0.16	18,245
% Reduced	—	—	—	—	—	—	65%	62%	—	62%	51%	—	—	—	—	—	—	—

Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.16	2.63	23.1	23.4	0.05	0.82	15.0	15.8	0.75	3.16	3.92	—	5,190	5,190	0.20	0.14	0.71	5,237
Mit.	3.16	2.63	23.1	23.4	0.05	0.82	5.30	6.12	0.75	1.20	1.95	—	5,190	5,190	0.20	0.14	0.71	5,237
% Reduced	—	—	—	—	—	—	65%	61%	—	62%	50%	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.58	0.48	4.22	4.27	0.01	0.15	2.73	2.88	0.14	0.58	0.71	—	859	859	0.03	0.02	0.12	867
Mit.	0.58	0.48	4.22	4.27	0.01	0.15	0.97	1.12	0.14	0.22	0.36	—	859	859	0.03	0.02	0.12	867
% Reduced	—	—	—	—	—	—	65%	61%	—	62%	50%	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

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

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	11.0	9.16	80.6	81.7	0.18	2.83	56.7	59.5	2.60	11.2	13.8	—	18,081	18,081	0.69	0.50	6.01	18,254
2026	6.30	5.25	44.3	42.7	0.11	1.78	56.7	58.5	1.64	11.2	12.9	—	12,633	12,633	0.46	0.46	5.66	12,787
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	11.0	9.14	80.8	81.7	0.18	2.83	56.7	59.5	2.60	11.2	13.8	—	18,077	18,077	0.69	0.50	0.16	18,245
2026	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	3.16	2.63	23.1	23.4	0.05	0.82	15.0	15.8	0.75	3.16	3.92	—	5,190	5,190	0.20	0.14	0.71	5,237
2026	1.21	1.01	8.53	8.18	0.02	0.34	10.2	10.5	0.32	2.08	2.40	—	2,422	2,422	0.09	0.09	0.47	2,451
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2025	0.58	0.48	4.22	4.27	0.01	0.15	2.73	2.88	0.14	0.58	0.71	—	859	859	0.03	0.02	0.12	867
2026	0.22	0.18	1.56	1.49	< 0.005	0.06	1.86	1.92	0.06	0.38	0.44	—	401	401	0.01	0.01	0.08	406

2.3. Construction Emissions by Year, Mitigated

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

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	11.0	9.16	80.6	81.7	0.18	2.83	19.9	22.7	2.60	4.22	6.82	—	18,081	18,081	0.69	0.50	6.01	18,254
2026	6.30	5.25	44.3	42.7	0.11	1.78	19.9	21.7	1.64	4.22	5.86	—	12,633	12,633	0.46	0.46	5.66	12,787
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	11.0	9.14	80.8	81.7	0.18	2.83	19.9	22.7	2.60	4.22	6.82	—	18,077	18,077	0.69	0.50	0.16	18,245
2026	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	3.16	2.63	23.1	23.4	0.05	0.82	5.30	6.12	0.75	1.20	1.95	—	5,190	5,190	0.20	0.14	0.71	5,237
2026	1.21	1.01	8.53	8.18	0.02	0.34	3.59	3.93	0.32	0.79	1.10	—	2,422	2,422	0.09	0.09	0.47	2,451
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.58	0.48	4.22	4.27	0.01	0.15	0.97	1.12	0.14	0.22	0.36	—	859	859	0.03	0.02	0.12	867
2026	0.22	0.18	1.56	1.49	< 0.005	0.06	0.65	0.72	0.06	0.14	0.20	—	401	401	0.01	0.01	0.08	406

3. Construction Emissions Details

3.1. Site preparation (2025) - Unmitigated

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

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

Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	5.22	4.39	36.1	36.2	0.08	1.55	—	1.55	1.42	—	1.42	—	8,604	8,604	0.35	0.07	—	8,634
Dust From Material Movement	—	—	—	—	—	—	14.2	14.2	—	6.85	6.85	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	0.12	0.99	0.99	< 0.005	0.04	—	0.04	0.04	—	0.04	—	236	236	0.01	< 0.005	—	237
Dust From Material Movement	—	—	—	—	—	—	0.39	0.39	—	0.19	0.19	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.02	0.18	0.18	< 0.005	0.01	—	0.01	0.01	—	0.01	—	39.0	39.0	< 0.005	< 0.005	—	39.2
Dust From Material Movement	—	—	—	—	—	—	0.07	0.07	—	0.03	0.03	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.33	0.00	0.00	1.23	1.23	0.00	0.13	0.13	—	61.8	61.8	< 0.005	< 0.005	0.23	62.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	0.03	0.03	0.00	< 0.005	< 0.005	—	1.57	1.57	< 0.005	< 0.005	< 0.005	1.59
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	0.26	0.26	< 0.005	< 0.005	< 0.005	0.26
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.2. Site preparation (2025) - Mitigated

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

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

Off-Road Equipment	5.22	4.39	36.1	36.2	0.08	1.55	—	1.55	1.42	—	1.42	—	8,604	8,604	0.35	0.07	—	8,634
Dust From Material Movement	—	—	—	—	—	—	5.52	5.52	—	2.67	2.67	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	0.12	0.99	0.99	< 0.005	0.04	—	0.04	0.04	—	0.04	—	236	236	0.01	< 0.005	—	237
Dust From Material Movement	—	—	—	—	—	—	0.15	0.15	—	0.07	0.07	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.02	0.18	0.18	< 0.005	0.01	—	0.01	0.01	—	0.01	—	39.0	39.0	< 0.005	< 0.005	—	39.2
Dust From Material Movement	—	—	—	—	—	—	0.03	0.03	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.33	0.00	0.00	1.23	1.23	0.00	0.13	0.13	—	61.8	61.8	< 0.005	< 0.005	0.23	62.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	0.03	0.03	0.00	< 0.005	< 0.005	—	1.57	1.57	< 0.005	< 0.005	< 0.005	1.59
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	0.26	0.26	< 0.005	< 0.005	< 0.005	0.26
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Setback levee and pump station construction (2025) (2025) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	10.9	9.07	77.4	80.5	0.17	2.78	—	2.78	2.56	—	2.56	—	15,600	15,600	0.63	0.13	—	15,653

Dust From Material Movement	—	—	—	—	—	—	14.2	14.2	—	6.85	6.85	—	—	—	—	—	—	—
Onsite truck	0.02	0.02	0.39	0.24	< 0.005	< 0.005	30.9	30.9	< 0.005	3.09	3.09	—	108	108	0.01	0.02	0.18	113
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	10.9	9.07	77.4	80.5	0.17	2.78	—	2.78	2.56	—	2.56	—	15,600	15,600	0.63	0.13	—	15,653
Dust From Material Movement	—	—	—	—	—	—	14.2	14.2	—	6.85	6.85	—	—	—	—	—	—	—
Onsite truck	0.02	0.01	0.41	0.24	< 0.005	< 0.005	30.9	30.9	< 0.005	3.09	3.09	—	109	109	0.01	0.02	< 0.005	114
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.98	2.49	21.2	22.1	0.05	0.76	—	0.76	0.70	—	0.70	—	4,274	4,274	0.17	0.03	—	4,289
Dust From Material Movement	—	—	—	—	—	—	3.89	3.89	—	1.88	1.88	—	—	—	—	—	—	—
Onsite truck	0.01	< 0.005	0.11	0.07	< 0.005	< 0.005	7.75	7.75	< 0.005	0.77	0.77	—	29.7	29.7	< 0.005	< 0.005	0.02	31.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.54	0.45	3.87	4.03	0.01	0.14	—	0.14	0.13	—	0.13	—	708	708	0.03	0.01	—	710

Dust From Material Movement	—	—	—	—	—	—	0.71	0.71	—	0.34	0.34	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	1.41	1.41	< 0.005	0.14	0.14	—	4.91	4.91	< 0.005	< 0.005	< 0.005	5.16
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.33	0.00	0.00	1.23	1.23	0.00	0.13	0.13	—	61.8	61.8	< 0.005	< 0.005	0.23	62.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.09	0.05	2.77	0.66	0.02	0.04	10.3	10.4	0.04	1.14	1.18	—	2,311	2,311	0.05	0.36	5.60	2,424
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.24	0.00	0.00	1.23	1.23	0.00	0.13	0.13	—	55.7	55.7	< 0.005	< 0.005	0.01	56.4
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.09	0.04	2.96	0.67	0.02	0.04	10.3	10.4	0.04	1.14	1.18	—	2,312	2,312	0.05	0.36	0.15	2,421
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	< 0.005	0.01	0.07	0.00	0.00	0.31	0.31	0.00	0.03	0.03	—	15.7	15.7	< 0.005	< 0.005	0.03	15.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.03	0.01	0.79	0.18	< 0.005	0.01	2.60	2.61	0.01	0.29	0.30	—	633	633	0.01	0.10	0.66	664
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	2.59	2.59	< 0.005	< 0.005	< 0.005	2.63
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.14	0.03	< 0.005	< 0.005	0.47	0.48	< 0.005	0.05	0.05	—	105	105	< 0.005	0.02	0.11	110

3.4. Setback levee and pump station construction (2025) (2025) - Mitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	10.9	9.07	77.4	80.5	0.17	2.78	—	2.78	2.56	—	2.56	—	15,600	15,600	0.63	0.13	—	15,653
Dust From Material Movement	—	—	—	—	—	—	5.54	5.54	—	2.67	2.67	—	—	—	—	—	—	—
Onsite truck	0.02	0.02	0.39	0.24	< 0.005	< 0.005	2.77	2.78	< 0.005	0.28	0.28	—	108	108	0.01	0.02	0.18	113
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	10.9	9.07	77.4	80.5	0.17	2.78	—	2.78	2.56	—	2.56	—	15,600	15,600	0.63	0.13	—	15,653
Dust From Material Movement	—	—	—	—	—	—	5.54	5.54	—	2.67	2.67	—	—	—	—	—	—	—
Onsite truck	0.02	0.01	0.41	0.24	< 0.005	< 0.005	2.77	2.78	< 0.005	0.28	0.28	—	109	109	0.01	0.02	< 0.005	114
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.98	2.49	21.2	22.1	0.05	0.76	—	0.76	0.70	—	0.70	—	4,274	4,274	0.17	0.03	—	4,289
Dust From Material Movement	—	—	—	—	—	—	1.52	1.52	—	0.73	0.73	—	—	—	—	—	—	—

Onsite truck	0.01	< 0.005	0.11	0.07	< 0.005	< 0.005	0.70	0.70	< 0.005	0.07	0.07	—	29.7	29.7	< 0.005	< 0.005	0.02	31.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.54	0.45	3.87	4.03	0.01	0.14	—	0.14	0.13	—	0.13	—	708	708	0.03	0.01	—	710
Dust From Material Movement	—	—	—	—	—	—	0.28	0.28	—	0.13	0.13	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.13	0.13	< 0.005	0.01	0.01	—	4.91	4.91	< 0.005	< 0.005	< 0.005	5.16
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.33	0.00	0.00	1.23	1.23	0.00	0.13	0.13	—	61.8	61.8	< 0.005	< 0.005	0.23	62.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.09	0.05	2.77	0.66	0.02	0.04	10.3	10.4	0.04	1.14	1.18	—	2,311	2,311	0.05	0.36	5.60	2,424
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.24	0.00	0.00	1.23	1.23	0.00	0.13	0.13	—	55.7	55.7	< 0.005	< 0.005	0.01	56.4
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.09	0.04	2.96	0.67	0.02	0.04	10.3	10.4	0.04	1.14	1.18	—	2,312	2,312	0.05	0.36	0.15	2,421
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	< 0.005	0.01	0.07	0.00	0.00	0.31	0.31	0.00	0.03	0.03	—	15.7	15.7	< 0.005	< 0.005	0.03	15.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.03	0.01	0.79	0.18	< 0.005	0.01	2.60	2.61	0.01	0.29	0.30	—	633	633	0.01	0.10	0.66	664
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	2.59	2.59	< 0.005	< 0.005	< 0.005	2.63

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.14	0.03	< 0.005	< 0.005	0.47	0.48	< 0.005	0.05	0.05	—	105	105	< 0.005	0.02	0.11	110

3.5. Setback levee and pump station construction (2026) (2026) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	6.17	5.17	41.2	41.5	0.10	1.74	—	1.74	1.60	—	1.60	—	10,203	10,203	0.41	0.08	—	10,238
Dust From Material Movement	—	—	—	—	—	—	14.2	14.2	—	6.86	6.86	—	—	—	—	—	—	—
Onsite truck	0.02	0.02	0.38	0.24	< 0.005	< 0.005	30.9	30.9	< 0.005	3.09	3.09	—	106	106	0.01	0.02	0.17	111
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.18	0.99	7.91	7.96	0.02	0.33	—	0.33	0.31	—	0.31	—	1,957	1,957	0.08	0.02	—	1,963
Dust From Material Movement	—	—	—	—	—	—	2.73	2.73	—	1.32	1.32	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.08	0.05	< 0.005	< 0.005	5.42	5.42	< 0.005	0.54	0.54	—	20.4	20.4	< 0.005	< 0.005	0.01	21.4

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.22	0.18	1.44	1.45	< 0.005	0.06	—	0.06	0.06	—	0.06	—	324	324	0.01	< 0.005	—	325
Dust From Material Movement	—	—	—	—	—	—	0.50	0.50	—	0.24	0.24	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.99	0.99	< 0.005	0.10	0.10	—	3.37	3.37	< 0.005	< 0.005	< 0.005	3.54
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.30	0.00	0.00	1.23	1.23	0.00	0.13	0.13	—	60.5	60.5	< 0.005	< 0.005	0.21	61.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.09	0.04	2.69	0.65	0.02	0.04	10.3	10.4	0.04	1.14	1.18	—	2,264	2,264	0.04	0.36	5.29	2,377
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.05	0.00	0.00	0.22	0.22	0.00	0.02	0.02	—	10.7	10.7	< 0.005	< 0.005	0.02	10.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	0.01	0.54	0.13	< 0.005	0.01	1.82	1.83	0.01	0.20	0.21	—	434	434	0.01	0.07	0.43	455
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	0.04	0.04	0.00	< 0.005	< 0.005	—	1.78	1.78	< 0.005	< 0.005	< 0.005	1.80
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.10	0.02	< 0.005	< 0.005	0.33	0.33	< 0.005	0.04	0.04	—	71.9	71.9	< 0.005	0.01	0.07	75.4

3.6. Setback levee and pump station construction (2026) (2026) - Mitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	6.17	5.17	41.2	41.5	0.10	1.74	—	1.74	1.60	—	1.60	—	10,203	10,203	0.41	0.08	—	10,238
Dust From Material Movement	—	—	—	—	—	—	5.55	5.55	—	2.67	2.67	—	—	—	—	—	—	—
Onsite truck	0.02	0.02	0.38	0.24	< 0.005	< 0.005	2.77	2.78	< 0.005	0.28	0.28	—	106	106	0.01	0.02	0.17	111
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.18	0.99	7.91	7.96	0.02	0.33	—	0.33	0.31	—	0.31	—	1,957	1,957	0.08	0.02	—	1,963
Dust From Material Movement	—	—	—	—	—	—	1.06	1.06	—	0.51	0.51	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.08	0.05	< 0.005	< 0.005	0.49	0.49	< 0.005	0.05	0.05	—	20.4	20.4	< 0.005	< 0.005	0.01	21.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.22	0.18	1.44	1.45	< 0.005	0.06	—	0.06	0.06	—	0.06	—	324	324	0.01	< 0.005	—	325

Dust From Material Movement	—	—	—	—	—	—	0.19	0.19	—	0.09	0.09	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.09	0.09	< 0.005	0.01	0.01	—	3.37	3.37	< 0.005	< 0.005	< 0.005	3.54
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.30	0.00	0.00	1.23	1.23	0.00	0.13	0.13	—	60.5	60.5	< 0.005	< 0.005	0.21	61.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.09	0.04	2.69	0.65	0.02	0.04	10.3	10.4	0.04	1.14	1.18	—	2,264	2,264	0.04	0.36	5.29	2,377
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.05	0.00	0.00	0.22	0.22	0.00	0.02	0.02	—	10.7	10.7	< 0.005	< 0.005	0.02	10.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	0.01	0.54	0.13	< 0.005	0.01	1.82	1.83	0.01	0.20	0.21	—	434	434	0.01	0.07	0.43	455
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	0.04	0.04	0.00	< 0.005	< 0.005	—	1.78	1.78	< 0.005	< 0.005	< 0.005	1.80
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.10	0.02	< 0.005	< 0.005	0.33	0.33	< 0.005	0.04	0.04	—	71.9	71.9	< 0.005	0.01	0.07	75.4

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

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

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

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

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

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

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

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

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

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

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

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

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

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

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

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

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

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

Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site preparation	Linear, Grubbing & Land Clearing	6/2/2025	6/12/2025	6.00	10.0	Clear vegetation, strip aggregate base, raise siphons and pipes
Setback levee and pump station construction (2025)	Linear, Grading & Excavation	6/16/2025	10/9/2025	6.00	100	Setback levee construction (2025)
Setback levee and pump station construction (2026)	Linear, Grading & Excavation	6/2/2026	8/21/2026	6.00	70.0	Setback levee construction (2026)

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site preparation	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Site preparation	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Site preparation	Graders	Diesel	Average	2.00	8.00	148	0.41
Site preparation	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37

Site preparation	Off-Highway Trucks	Diesel	Average	3.00	8.00	376	0.38
Setback levee and pump station construction (2025)	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Setback levee and pump station construction (2025)	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Setback levee and pump station construction (2025)	Graders	Diesel	Average	2.00	8.00	148	0.41
Setback levee and pump station construction (2025)	Plate Compactors	Diesel	Average	2.00	8.00	8.00	0.43
Setback levee and pump station construction (2025)	Off-Highway Trucks	Diesel	Average	3.00	8.00	376	0.38
Setback levee and pump station construction (2025)	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Setback levee and pump station construction (2025)	Cranes	Diesel	Average	1.00	8.00	367	0.29
Setback levee and pump station construction (2025)	Generator Sets	Diesel	Average	2.00	8.00	14.0	0.74
Setback levee and pump station construction (2025)	Pumps	Diesel	Average	4.00	8.00	376	0.38
Setback levee and pump station construction (2026)	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Setback levee and pump station construction (2026)	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Setback levee and pump station construction (2026)	Graders	Diesel	Average	2.00	8.00	148	0.41

Setback levee and pump station construction (2026)	Plate Compactors	Diesel	Average	2.00	8.00	8.00	0.43
Setback levee and pump station construction (2026)	Off-Highway Trucks	Diesel	Average	3.00	8.00	376	0.38
Setback levee and pump station construction (2026)	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Setback levee and pump station construction (2026)	Cranes	Diesel	Average	1.00	8.00	367	0.29
Setback levee and pump station construction (2026)	Generator Sets	Diesel	Average	2.00	8.00	14.0	0.74
Setback levee and pump station construction (2026)	Pumps	Diesel	Average	4.00	8.00	11.0	0.74

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site preparation	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Site preparation	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Site preparation	Graders	Diesel	Average	2.00	8.00	148	0.41
Site preparation	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Site preparation	Off-Highway Trucks	Diesel	Average	3.00	8.00	376	0.38
Setback levee and pump station construction (2025)	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Setback levee and pump station construction (2025)	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40

Setback levee and pump station construction (2025)	Graders	Diesel	Average	2.00	8.00	148	0.41
Setback levee and pump station construction (2025)	Plate Compactors	Diesel	Average	2.00	8.00	8.00	0.43
Setback levee and pump station construction (2025)	Off-Highway Trucks	Diesel	Average	3.00	8.00	376	0.38
Setback levee and pump station construction (2025)	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Setback levee and pump station construction (2025)	Cranes	Diesel	Average	1.00	8.00	367	0.29
Setback levee and pump station construction (2025)	Generator Sets	Diesel	Average	2.00	8.00	14.0	0.74
Setback levee and pump station construction (2025)	Pumps	Diesel	Average	4.00	8.00	376	0.38
Setback levee and pump station construction (2026)	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Setback levee and pump station construction (2026)	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Setback levee and pump station construction (2026)	Graders	Diesel	Average	2.00	8.00	148	0.41
Setback levee and pump station construction (2026)	Plate Compactors	Diesel	Average	2.00	8.00	8.00	0.43
Setback levee and pump station construction (2026)	Off-Highway Trucks	Diesel	Average	3.00	8.00	376	0.38

Setback levee and pump station construction (2026)	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Setback levee and pump station construction (2026)	Cranes	Diesel	Average	1.00	8.00	367	0.29
Setback levee and pump station construction (2026)	Generator Sets	Diesel	Average	2.00	8.00	14.0	0.74
Setback levee and pump station construction (2026)	Pumps	Diesel	Average	4.00	8.00	11.0	0.74

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site preparation	—	—	—	—
Site preparation	Worker	4.00	20.0	LDA,LDT1,LDT2
Site preparation	Vendor	0.00	0.00	HHDT,MHDT
Site preparation	Hauling	0.00	0.00	HHDT
Site preparation	Onsite truck	0.00	0.00	HHDT
Setback levee and pump station construction (2025)	—	—	—	—
Setback levee and pump station construction (2025)	Worker	4.00	20.0	LDA,LDT1,LDT2
Setback levee and pump station construction (2025)	Vendor	0.00	0.00	HHDT,MHDT
Setback levee and pump station construction (2025)	Hauling	33.0	20.0	HHDT
Setback levee and pump station construction (2025)	Onsite truck	21.0	1.00	HHDT

Setback levee and pump station construction (2026)	—	—	—	—
Setback levee and pump station construction (2026)	Worker	4.00	20.0	LDA,LDT1,LDT2
Setback levee and pump station construction (2026)	Vendor	0.00	0.00	HHDT,MHDT
Setback levee and pump station construction (2026)	Hauling	33.0	20.0	HHDT
Setback levee and pump station construction (2026)	Onsite truck	21.0	1.00	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site preparation	—	—	—	—
Site preparation	Worker	4.00	20.0	LDA,LDT1,LDT2
Site preparation	Vendor	0.00	0.00	HHDT,MHDT
Site preparation	Hauling	0.00	0.00	HHDT
Site preparation	Onsite truck	0.00	0.00	HHDT
Setback levee and pump station construction (2025)	—	—	—	—
Setback levee and pump station construction (2025)	Worker	4.00	20.0	LDA,LDT1,LDT2
Setback levee and pump station construction (2025)	Vendor	0.00	0.00	HHDT,MHDT
Setback levee and pump station construction (2025)	Hauling	33.0	20.0	HHDT
Setback levee and pump station construction (2025)	Onsite truck	21.0	1.00	HHDT
Setback levee and pump station construction (2026)	—	—	—	—
Setback levee and pump station construction (2026)	Worker	4.00	20.0	LDA,LDT1,LDT2

Setback levee and pump station construction (2026)	Vendor	0.00	0.00	HHDT,MHDT
Setback levee and pump station construction (2026)	Hauling	33.0	20.0	HHDT
Setback levee and pump station construction (2026)	Onsite truck	21.0	1.00	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site preparation	—	—	0.00	0.00	—
Setback levee and pump station construction (2025)	22,000	—	0.00	0.00	—
Setback levee and pump station construction (2026)	52,500	—	0.00	0.00	—

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt

User Defined Linear	0.00	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2025	0.00	204	0.03	< 0.005
2026	0.00	204	0.03	< 0.005

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
Other	Histosol	0.00	23.0

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
Other	Histosol	0.00	23.0

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres
Shrubland	0.00	23.0

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres
Shrubland	0.00	23.0

5.18.2. Sequestration

5.18.2.1. Unmitigated

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

5.18.2.2. Mitigated

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

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

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

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	22.9	annual days of extreme heat
Extreme Precipitation	1.65	annual days with precipitation above 20 mm
Sea Level Rise	1.54	meters of inundation depth
Wildfire	0.00	annual hectares burned

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

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

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

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

6.3. Adjusted Climate Risk Scores

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

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

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

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

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	45.1
AQ-PM	44.2
AQ-DPM	42.9
Drinking Water	98.4
Lead Risk Housing	47.8
Pesticides	86.7
Toxic Releases	16.5
Traffic	54.0
Effect Indicators	—
CleanUp Sites	20.5
Groundwater	84.0
Haz Waste Facilities/Generators	72.6
Impaired Water Bodies	97.5
Solid Waste	52.9
Sensitive Population	—
Asthma	22.4

Cardio-vascular	42.0
Low Birth Weights	74.4
Socioeconomic Factor Indicators	—
Education	82.2
Housing	28.2
Linguistic	75.2
Poverty	90.4
Unemployment	93.1

7.2. Healthy Places Index Scores

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

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	20.47991788
Employed	35.60887976
Median HI	20.67239831
Education	—
Bachelor's or higher	25.84370589
High school enrollment	7.211600154
Preschool enrollment	88.36134993
Transportation	—
Auto Access	73.42486847
Active commuting	67.86860003
Social	—
2-parent households	88.38701399
Voting	77.37713332
Neighborhood	—
Alcohol availability	58.78352368

Park access	2.194276915
Retail density	1.437187219
Supermarket access	12.78070063
Tree canopy	64.51944052
Housing	—
Homeownership	49.62145515
Housing habitability	67.86860003
Low-inc homeowner severe housing cost burden	55.48569229
Low-inc renter severe housing cost burden	75.08020018
Uncrowded housing	50.73784165
Health Outcomes	—
Insured adults	43.44924933
Arthritis	0.0
Asthma ER Admissions	87.8
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	8.4
Cognitively Disabled	41.3
Physically Disabled	33.4
Heart Attack ER Admissions	74.2
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	98.9

Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	64.0
Elderly	16.5
English Speaking	25.5
Foreign-born	66.1
Outdoor Workers	2.9
Climate Change Adaptive Capacity	—
Impervious Surface Cover	94.8
Traffic Density	52.2
Traffic Access	0.0
Other Indices	—
Hardship	77.9
Other Decision Support	—
2016 Voting	55.8

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	81.0
Healthy Places Index Score for Project Location (b)	39.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No

Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

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

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	Project construction is expected to take 12 months between May and November over a two-year period. An estimated 180 working days will be necessary to complete the Project. Work is expected to occur Monday through Saturday with light work (e.g., maintenance of equipment) on Sundays if needed.
Construction: Off-Road Equipment	Per estimates given by MBK in Project Description.
Construction: Trips and VMT	Estimates per Project Description from MBK. Worker and hauling trip length is assumed to be 20 miles. Onsite trucks are assumed to stay on site (~1 mile per trip).
Construction: On-Road Fugitive Dust	Worker and hauling is assumed to be predominantly on paved road. Onsite trucks are assumed to be on unpaved road.

Appendix B

Database Query Results for Special-status Plant Species and Sensitive Natural Communities Previously Documented in the Project Region

Table B-1. Database query results for special-status plant species previously documented in the Project Region.

Scientific name	Common name	Status[1] (Federal / State / CRPR)	Query source	Blooming period	Elevation range (ft)	Habitat associations	Potential to occur in the Project Area
Amsinckia grandiflora	large-flowered fiddleneck	FE/CE/1B.1	–/–/USFWS	(March) April–May	886–1,804	Cismontane woodland, and valley and foothill grassland	None; outside of elevation range
Astragalus tener var. *tener*	alkali milk-vetch	None/None/1B.2	CNPS/CNDDB/–	March–June	0–195	Alkaline areas in playas, valley and foothill grassland with adobe clay soils, and vernal pools	Unlikely; suitable habitat likely not present
Atriplex coronata var. *coronata*	crownscale	None/None/4.2	CNPS/–/–	March–October	0–1,935	Alkaline, often clay, areas in chenopod scrub, valley and foothill grassland, and vernal pools	Unlikely; suitable habitat likely not present
Azolla microphylla	Mexican mosquito fern	None/None/4.2	CNPS/–/–	August	100–330	marshes and swamps (ponds, slow water)	None; outside of elevation range
Blepharizonia plumosa	big tarplant	None/None/1B.1	CNPS/CNDDB/–	July–October	95–1,655	Usually clay areas in valley and foothill grassland	None; outside of elevation range
Brasenia schreberi	watershield	None/None/2B.3	CNPS/CNDDB/–	June–September	95–7,220	Freshwater marshes and swamps	Yes; suitable habitat is present. An occurrence from 1893 that overlaps with the Project Area is extirpated
Carex comosa	bristly sedge	None/None/2B.1	CNPS/CNDDB/–	May–September	0–2,050	Coastal prairie, lake margins of marshes and swamps,and valley and foothill grassland	Yes; suitable habitat is present

Scientific name	Common name	Status[1] (Federal / State / CRPR)	Query source	Blooming period	Elevation range (ft)	Habitat associations	Potential to occur in the Project Area
Chloropyron molle subsp. *molle*	soft bird's-beak	FE/CR/1B.2	CNPS/CNDDB/–	June–November	0–10	Coastal salt marshes and swamps	Unlikely; suitable habitat likely not present
Cicuta maculata var. *bolanderi*	Bolander's water-hemlock	None/None/2B.1	CNPS/CNDDB/–	July–September	0–655	Marshes and swamps, and coastal, fresh or brackish water	Yes; suitable habitat is present
Eryngium racemosum	Delta button-celery	None/CE/1B.1	CNPS/CNDDB/–	June–October	5–100	Vernally mesic clay depressions in riparian scrub	Unlikely; suitable habitat likely not present
Eryngium spinosepalum	spiny-sepaled button-celery	None/None/1B.2	CNPS/–/–	April–June	260–3,200	valley and foothill grassland, vernal pools	None; outside of elevation range
Erysimum capitatum var. *angustatum*	Contra Costa wallflower	FE/CE/1B.1	CNPS/–/–	March–July	10–65	Inland dunes	None; suitable habitat not present
Extriplex joaquinana	San Joaquin spearscale	None/None/1B.2	CNPS/CNDDB/–	April–October	0–2,740	Alkaline areas in chenopod scrub, meadows and seeps, playas, and valley and foothill grassland	Unlikely; suitable habitat likely not present
Fritillaria agrestis	stinkbells	None/None/4.2	CNPS/CNDDB/–	March–June	30–5,100	Clay, sometimes serpentinite, areas in chaparral, cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland	Unlikely; suitable habitat likely not present
Hesperolinon breweri	Brewer's western flax	None/None/1B.2	CNPS/CNDDB/–	May–July	95–3,100	Usually serpentinite areas in chaparral, cismontane woodland, and valley and foothill grassland	None; outside of elevation range

Scientific name	Common name	Status[1] (Federal / State / CRPR)	Query source	Blooming period	Elevation range (ft)	Habitat associations	Potential to occur in the Project Area
Hibiscus lasiocarpos var. *occidentalis*	woolly rose-mallow	None/None/1B.2	CNPS/CNDDB/–	June–September	0–395	Often in riprap on sides of levees of freshwater marshes and swamps	Yes; suitable habitat is present
Lasthenia ferrisiae	Ferris' goldfields	None/None/4.2	CNPS/CNDDB/–	February–May	65–2,295	Alkaline and clay areas in vernal pools	Unlikely; suitable habitat likely not present
Lathyrus jepsonii var. *jepsonii*	Delta tule pea	None/None/1B.2	CNPS/–/–	May–July (August–September)	0–15	Freshwater and brackish marshes and swamps	Yes; previously documented near the Project Area
Lilaeopsis masonii	Mason's lilaeopsis	None/CR/1B.1	CNPS/CNDDB/–	April–November	0–35	Brackish or freshwater marshes and swamps, and riparian scrub	Yes; suitable habitat is present
Limosella australis	Delta mudwort	None/None/2B.1	CNPS/CNDDB/–	May–August	0–10	Usually mud banks in freshwater or brackish marshes and swamps, and riparian scrub	Yes; suitable habitat is present
Oenothera deltoides subsp. *howellii*	Antioch Dunes evening-primrose	FE/CE/1B.1	CNPS/CNDDB/–	March–September	0–100	Inland dunes	None; suitable habitat not present
Potamogeton zosteriformis	eel-grass pondweed	None/None/2B.2	CNPS/CNDDB/–	June–July	0–6,100	Assorted freshwater marshes and swamps	Yes; suitable habitat is present
Sagittaria sanfordii	Sanford's arrowhead	None/None/1B.2	CNPS/CNDDB/–	May–October (November)	0–2,135	Assorted shallow freshwater marshes and swamps	Yes; suitable habitat is present
Scutellaria galericulata	marsh skullcap	None/None/2B.2	CNPS/CNDDB/–	June–September	0–6,890	Lower montane coniferous forest, mesic meadows and seeps, and marshes and swamps	Yes; suitable habitat is present

Scientific name	Common name	Status[1] (Federal / State / CRPR)	Query source	Blooming period	Elevation range (ft)	Habitat associations	Potential to occur in the Project Area
Scutellaria lateriflora	side-flowering skullcap	None/None/2B.2	CNPS/CNDDB/–	July–September	0–1,640	Mesic meadows and seeps, marshes and swamps	Yes; suitable habitat is present. An occurrence from 1892 overlaps with the Project Area
Symphyotrichum lentum	Suisun Marsh aster	None/None/1B.2	CNPS/CNDDB/–	(April) May–November	0–10	Brackish and freshwater marshes and swamps	Yes; previously documented within the Project Area
Tropidocarpum capparideum	caper-fruited tropidocarpum	None/None/1B.1	CNPS/CNDDB/–	March–April	0–1,495	Alkaline hills in valley and foothill grassland	Unlikely; suitable habitat likely not present

[1] Status:

Federal

FE Federally listed as endangered

– No federal status

State

CE State listed as endangered

CR State listed as rare

– No state status

California Rare Plant Rank (CRPR)

1B Plants rare, threatened, or endangered in California and elsewhere

2B Plants rare, threatened, or endangered in California, but more common elsewhere

4 Plants of limited distribution, a watch list

CRPR Threat Ranks:

0.1 Seriously threatened in California (high degree/immediacy of threat)

0.2 Fairly threatened in California (moderate degree/immediacy of threat)

0.3 Not very threatened in California (low degree/immediacy of threats or no current threats known)

Table B-2. CNDDB query results for sensitive natural communities previously documented in the Project region.

Natural community (Holland 1986)	Status	Distribution[1]	Habitat description[1]	Potential corresponding sensitive natural communities, as MCV Alliances[2]	State rank	Potential to occur in the Project Area
Alkali Meadow	S2.1	Occurs in valley bottoms and on the lower portions of alluvial slopes east of the Cascades and Sierra Nevada, around Alkali Seeps from Kern to Placer counties, and the salty grasslands of the western Sacramento Valley from San Joaquin to Glenn and Colusa counties at elevations of 3,500 to 7,000 feet	On fine-textured, more or less permanently moist, alkaline soils	*Anemopsis californica - Helianthus nuttallii - Solidago spectabilis* Herbaceous Alliance (Yerba mansa - Nuttall's sunflower - Nevada goldenrod alkaline wet meadows)	S2	None; characteristic species not present
				Cressa truxillensis - Distichlis spicata Herbaceous Alliance (Alkali weed - salt grass playas and sinks)	S2	None; characteristic species not present
				Frankenia salina Herbaceous Alliance (Alkali heath marsh)	S3	None; characteristic species not present
				Sporobolus airoides - Muhlenbergia asperifolia - Spartina gracilis Herbaceous Alliance (Alkali sacaton - scratchgrass - alkali cordgrass alkaline wet meadow)	S2	None; characteristic species not present
Alkali Seep	S2.1	Scattered throughout the desert regions of California; less common in other areas	Temporarily exposed to permanently flooded alkali marshes	*Ruppia* (*cirrhosa, maritima*) Herbaceous Alliance (Ditch-grass or widgeon-grass mats)	S2	None; characteristic species not present
Cismontane Alkali Marsh	S1.1	Occurs in lake beds and other areas on the floodplains of the Sacramento and San Joaquin rivers, and low-lying areas of Kings and Kern counties at elevations below 1,000 feet	Standing water or saturated alkaline soil	*Anemopsis californica - Helianthus nuttallii - Solidago spectabilis* Herbaceous Alliance (Yerba mansa - Nuttall's sunflower - Nevada goldenrod alkaline wet meadows)	S2	None; characteristic species not present
				Frankenia salina Herbaceous Alliance (Alkali heath marsh)	S3	None; characteristic species not present
				Grindelia (*stricta*) Provisional Herbaceous Alliance (Gum plant patches)	S2S3	None; characteristic species not present
				Ruppia (*cirrhosa, maritima*) Herbaceous Alliance (Ditch-grass or widgeon-grass mats)	S2	None; characteristic species not present
				Sarcocornia pacifica (*Salicornia depressa*) Herbaceous Alliance (Pickleweed mats)	S3	None; characteristic species not present
				Schoenoplectus (*acutus, californicus*) Herbaceous Alliance (Hardstem and California bulrush marshes)	S3S4	High; documented in Project Area

Natural community (Holland 1986)	Status	Distribution[1]	Habitat description[1]	Potential corresponding sensitive natural communities, as MCV Alliances[2]	State rank	Potential to occur in the Project Area
Coastal and Valley Freshwater Marsh	S2.1	Remnant stands are most extensive in the upper portion of the Sacramento-San Joaquin River Delta, in river oxbows and other areas on the floodplain. Occurs occasionally along the coast, in coastal valleys near river mouths, and around the margins of lakes and springs	Quiet sites (lacking significant current) permanently flooded by fresh water (rather than brackish, alkaline, or variable)	*Carex obnupta - Oenanthe sarmentosa - Scirpus microcarpus* Herbaceous Alliance (Slough sedge - Water-parsley - Small-fruited bulrush marsh)	S3	None; characteristic species not present
				Deschampsia cespitosa - Hordeum brachyantherum - Danthonia californica Herbaceous Alliance (Coastal tufted hair grass - Meadow barley - California oatgrass meadow)	S3	None, habitat not present or of low quality
				Equisetum (*arvense, variegatum, hyemale*) Herbaceous Alliance (Field horsetail - scouringrush horsetail - variegated scouringrush wet meadow)	S3S4	High; documented in Project Area
				Hydrocotyle (*ranunculoides, umbellata*) Herbaceous Alliance (Mats of floating pennywort)	S3?	None; characteristic species not present
				Isoetes (*bolanderi, echinospora, howellii, nuttallii, occidentalis*) Provisional Herbaceous Alliance (Quillwort beds)	S3?	None; characteristic species not present
				Nuphar lutea Provisional Herbaceous Alliance (Yellow pond-lily mats)	S3	None; characteristic species not present
				Schoenoplectus (*acutus, californicus*) Herbaceous Alliance (Hardstem and California bulrush marshes)	S3S4	High; documented in Project Area
				Schoenoplectus americanus Herbaceous Alliance (Common Three-square marsh)	S3.2	None; characteristic species not present

Natural community (Holland 1986)	Status	Distribution[1]	Habitat description[1]	Potential corresponding sensitive natural communities, as MCV Alliances[2]	State rank	Potential to occur in the Project Area
Great Valley Valley Oak Riparian Forest	S1.1	Occurs in the low gradient, depositional portions of the Sacramento-San Joaquin River Delta. Remanent stands are scattered in the lower portion of the San Joaquin watershed and the floodplain of the Kings and Kaweah Rivers.	On fine-textured, depositional soils, but restricted to the higher sections of the floodplain where there is less flood disturbance.	*Carex barbarae* Herbaceous Alliance (White-root beds)	S2?	None; characteristic species not present
				Quercus lobata Riparian Forest & Woodland Alliance (Valley oak riparian forest and woodland)	S3	None; characteristic species not present

Notes: S1 = Critically Imperiled: At very high risk of extinction due to extreme rarity, very steep declines, or other factors
S2 = Imperiled: At high risk of extinction or elimination due to very restricted range, very few populations, steep declines, or other factors
0.1 = Very threatened

[1] Source: Holland (1986)
[2] Source: CNPS (2025b)

Appendix C

Database Query Results for Special-status Fish and Wildlife Species Previously Documented in the Project Region

Table C-1. Database query results for special-status fish and wildlife species previously documented in the Project Region.

Common name *Scientific name*	Query sources	Status[a] Federal/ State	Distribution in California	Habitat association	Likelihood to occur in Project Area
Invertebrates					
Vernal pool fairy shrimp *Branchinecta lynchi*	USFWS, CDFW	FT/–	Central Valley, central and south Coast Ranges from Tehama County to Santa Barbara County; isolated populations also in Riverside County	Vernal pools; also found in sandstone rock outcrop pools	None; no vernal pool habitat in Project Area and no observations within 10 mi of Project Area. Critical habitat has been designated for this species, but is not present within the Project Area
Vernal pool tadpole shrimp *Lepidurus packardi*	USFWS	FE/–	Shasta County south to Merced County	Vernal pools and ephemeral stock ponds	None; no vernal pool habitat in Project Area and no observations within 10 mi of Project Area. Critical habitat has been designated for this species, but is not present within the Project Area
Western bumble bee *Bombus occidentalis*	CDFW	–/SCE	Historically throughout northern California and adjacent states; the once common populations of central California have largely disappeared (Evans et al. 2008)	Forages on flowering plants in meadows and forested openings; abandoned rodent burrows are used for nests and hibernation sites for queens; wide variety of host plant genera	None; Project Area is outside the species' current known range (Evans et al. 2008)
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	USFWS, CDFW	FT/–	Riparian habitat in the Central Valley below 3,000 ft, most commonly in lowlands between 0 and 500 ft	Riparian and oak savanna habitats with host plant *Sambucus mexicana* (blue elderberry)	None; the Project Area does not contain the primary host plant for the species.
Monarch butterfly *Danaus plexippus*	USFWS	FPT/–	Range includes most of California; breeds throughout California and overwinters in suitable groves along the California coast	Adults forage on a variety of flowering plants during breeding and migration; larvae (caterpillars) require milkweed (*Asclepias* spp.) as a host plant. Overwinter groves are typically eucalyptus (*Eucalyptus* sp.), Monterey pine (*Pinus radiata*), and Monterey cypress (*Cupressus macrocarpa*)	Low; the Project Area does not contain milkweed and has few flowering plants; no overwintering tree sites near the Project Area (The Xerces Society 2025)
Fish					
Pacific lamprey *Entosphenus tridentatus*	CDFW	–/SSC	Coastal watersheds along the Pacific Coast, between Mexico and Oregon	Spawn and rear in rivers for up to seven years before emigrating to the ocean. Spawning occurs in coarse gravel near pool tails or low gradient riffles, while the larval rearing life stage requires low velocity areas with fine substrate and water temperatures of 22 degrees Celsius or below.	Low; River conditions near the Project Area are likely too swift and warm to support lamprey spawning or larval rearing, though the rivers likely serve as a migratory corridor. Very few lamprey have been observed in the San Joaquin or Mokelumne rivers near the Project Area since 2000, though they are present in the Sacramento River (CDFW 2025a,c,d).
North American green sturgeon: southern DPS *Acipenser medirostris*	NMFS, CDFW	FT/SSC	San Francisco, San Pablo, Suisun, and Humboldt bays; Sacramento-San Joaquin Delta; Sacramento River, Feather River, and Yuba River	Spawns in pools of large freshwater river mainstems with cool water and cobble, clean sand, or bedrock; in San Francisco Bay adults tend to utilize water depths less than 10 m (33 ft) to swim near the surface or forage along the sea floor	High; additional assessment provided in Section 2.4.1.6 of the document
White sturgeon *Acipenser transmontanus*	CDFW	–/SSC/SPT	Found in large river systems from Sacramento – San Joaquin and north; spawning occurs in the Sacramento and Feather Rivers	Adult and juveniles reside primarily in the brackish and freshwater regions of the San Francisco Estuary and Delta. Spawns in freshwater pools with cobble, sand, or bedrock in river mainstems. Juveniles and adults use all portions of the water column throughout estuary life history.	High; additional assessment provided in Section 2.4.1.6 of the document
Sacramento splittail *Pogonichthys macrolepidotus*	CDFW	–/SSC	Lower portions of the Napa, Petaluma, Sacramento and San Joaquin rivers; Sacramento-San Joaquin Delta including Suisun Bay, Suisun Marsh	Low elevation mainstem rivers and estuaries with low to moderate salinity (0-18 ppt); shallow, flooded vegetated habitat for spawning and foraging	High; additional assessment provided in Section 2.4.1.6 of the document
Delta smelt *Hypomesus transpacificus*	USFWS, CDFW	FT/SE	Found only in the Sacramento-San Joaquin Estuary, including the lower reaches of Sacramento and Napa rivers; the Delta including Suisun Bay, Goodyear, Suisun, Cutoff, First Mallard, and Montezuma sloughs	Estuarine or brackish waters up to 18 parts per thousand (ppt); spawn in shallow brackish water upstream of the mixing zone (zone of saltwater-freshwater interface) where salinity is around 2 ppt	Moderate; additional assessment provided in Section 2.4.1.6 of the document
Longfin smelt, San Francisco Bay-Delta DPS *Spirnichus thaleichthys*	USFWS, CDFW	FE/ST	San Francisco estuary from Rio Vista or Medford Island in the Delta as far downstream as South Bay; concentrated in Suisun, San Pablo, and North San Francisco bays	Adults in large bays, estuaries, and nearshore coastal areas; migrate into freshwater rivers to spawn; salinities of 15–30 ppt	High; additional assessment provided in Section 2.4.1.6 of the document

Common name *Scientific name*	Query sources	Status[a] Federal/ State	Distribution in California	Habitat association	Likelihood to occur in Project Area
Chinook salmon, Central Valley spring-run ESU *Oncorhynchus tshawytscha*	NMFS, CDFW	FT/ST	Sacramento River and its tributaries (Deer, Mill, Antelope, Battle, Beegum, Butte, and Big Chico creeks and the Feather and Yuba rivers)	Low- to mid-elevation rivers and streams with cold water, clean gravel of appropriate size for spawning and adequate rearing habitat; typically rear in freshwater for one or more years before migrating to the ocean	Moderate; additional assessment provided in Section 2.4.1.6 of the document
Chinook salmon, Sacramento River winter-run ESU *Oncorhynchus tshawytscha*	NMFS, CDFW	FE/SE	Sacramento River and its tributaries; Sacramento-San Joaquin Delta; San Francisco, San Pablo and Suisun bays	Mainstem river reaches with cool water and available spawning gravel; most spawning occurs in the mainstem Sacramento River downstream of Keswick Dam; juveniles rear five to ten months in the river and estuary; migrate to the ocean to feed and grow until sexually mature	Moderate; additional assessment provided in Section 2.4.1.6 of the document
Chinook salmon, Central Valley fall-/late-fall run ESU *Oncorhynchus tshawytscha*	NMFS	FSC/SSC	Sacramento River and its tributaries. San Joaquin River below Hills Ferry	Spawning and rearing occurs in cold, deep mainstem river reaches	Moderate; additional assessment provided in Section 2.4.1.6 of the document
Steelhead, Central Valley DPS *Oncorhynchus mykiss irideus*	NMFS, CDFW	FT/SSC	The Sacramento and San Joaquin rivers and their tributaries	Rivers and streams with cold water, clean gravel of appropriate size for spawning, and suitable rearing habitat; typically rear in freshwater for one or more years before migrating to the ocean	Moderate; additional assessment provided in Section 2.4.1.6 of the document
Amphibians					
California tiger salamander, central California DPS *Ambystoma californiense*	USFWS, CDFW	FT/ST	Fragmented populations in the Central Valley and Sierra foothills from northern Yolo County to northwestern Kern County and Tulare County, and along the Coast Ranges from San Mateo County to Central San Luis Obispo.	Grassland, oak savannah, or edges of woodland that provide subterranean refuge (typically mammal burrows); breeds in nearby temporary ponds, vernal pools, or slow-moving parts of streams	Low; no suitable breeding or refuge habitat within the Project Area and no observations within 10 mi of Project Area. Critical habitat has been designated for this species but is not present within the Project Area (70 FR 49380)
Western spadefoot *Spea hammondii*	USFWS, CDFW	FPT/SSC	Near Redding, south throughout the Central Valley and nearby foothills; Coast Ranges south of Monterey Bay; and coastal southern California south of the Transverse Mountains and west of the Peninsular Mountains	Areas with sparse vegetation and/or short grasses in friable soils; primarily in washes, river floodplains, alluvial fans, playas, alkali flats, among grasslands, chaparral, or pine-oak woodlands; breeds in ephemeral pools, cattle ponds, slow sections of streams, and other shallow water bodies with low levels of canopy cover.	None; the Project Area lacks suitable aquatic breeding habitat; no observations within 10 mi of Project Area
California red-legged frog *Rana draytonii*	CDFW	FT/SSC	Largely restricted to coastal drainages on the central coast from Mendocino County to Baja California; in the Sierra foothills south to Tulare and possibly Kern counties	Breeds in still or slow-moving water with emergent and overhanging vegetation, including wetlands, wet meadows, ponds, lakes, and low-gradient, slow moving stream reaches with permanent pools; uses adjacent uplands for dispersal and summer retreat	None; Project Area is outside the species' known range (CDFW 2021)
Reptiles					
Northwestern pond turtle *Actinemys marmorata*	CDFW	FPT/SSC	From the Oregon border along the coast ranges to the northern San Francisco Bay area as well as the Central Valley, Cascades, and Sierras	Permanent, slow-moving fresh or brackish water with available basking sites and adjacent open habitats or forest for nesting	High; additional assessment included in Section 2.4.1.7 of the document
Northern California legless lizard *Anniella pulchra*	CDFW	–/SSC	Fragmented populations in the San Joaquin Valley, from Contra Costa County to Ventura County	Sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces; warm, moist, loose soil for burrowing	None; the Project Area lacks suitable habitat, and no observations have been made within 10 mi. The edge of the species' range is just northwest of Project Area (CDFW 2021)
Coast horned lizard *Phrynosoma blainvillii*	CDFW	-/SSC	West of deserts and Cascade-Sierran highlands, as far north as Shasta Reservoir	Found in grasslands, coniferous forests, woodlands, and chaparral amongst open or low vegetation and patches of loose sandy soil such as along dirt roads and sandy washes; forages on ants at ant hills	None; limited suitable habitat within Project Area and no observations within 20 mi (CDFW 2025c)

Common name *Scientific name*	Query sources	Status[a] Federal/ State	Distribution in California	Habitat association	Likelihood to occur in Project Area
Giant garter snake *Thamnophis gigas*	USFWS, CDFW	FT/ST	Central Valley from the vicinity of Burrel in Fresno County north to near Chico in Butte County; has been extirpated from areas south of Fresno	Sloughs, canals, low- gradient streams and freshwater marsh habitats where there is a prey base of small fish and amphibians; also found in irrigation ditches and rice fields; requires grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter	High; additional assessment included in Section 2.4.1.7 of the document
Birds					
Numerous bird species	MBTA		Range encompasses California	Variable including, but not limited to, grasses, shrubs, and trees	High; See Section 2.4.1.7 of the document
American white pelican *Pelecanus erythrorhyncos*	CDFW	–/SSC	Breeds on lakes in the Klamath Basin, winters along the Pacific coast from Sonoma County south to Baja California and in the Central Valley	Salt ponds, large lakes, and estuaries; loafs on open water during the day; roosts along water's edge at night	High (foraging only); additional assessment included in Section 2.4.1.7 of the document
White-tailed kite *Elanus leucurus*	CDFW	–/SFP	Year-round resident; found in nearly all lowlands of California west of the Sierra Nevada mountains and the southeast deserts	Lowland grasslands and wetlands with open areas; nests in trees near open foraging area	High (foraging only); additional assessment included in Section 2.4.1.7 of the document
Bald eagle *Haliaeetus leucocephalus*	USFWS	FD, BGEPA/ SE, SFP	Permanent resident and uncommon winter migrant, found nesting primarily in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity counties	Large bodies of water or rivers with abundant fish, uses snags or other perches; nests in advanced-successional conifer forest near open water.	High (foraging only); additional assessment included in Section 2.4.1.7 of the document
Northern harrier *Circus hudsonius*	CDFW	–/SSC	Year-round resident; scattered throughout California; in the northwest, nests largely within coastal lowlands from Del Norte County south to Bodega Head in Sonoma County, inland to Napa County	Nests, forages, and roosts in wetlands or along rivers or lakes, but also in grasslands, meadows, or grain fields	High (foraging only); additional assessment included in Section 2.4.1.7 of the document
Swainson's hawk *Buteo swainsoni*	CDFW	–/ST	Summer resident; breeds in lower Sacramento and San Joaquin valleys, the Klamath Basin, and Butte Valley; highest nesting densities occur near Davis and Woodland, Yolo County	Nests in oaks or cottonwoods within or near riparian habitats; forages in grasslands, irrigated pastures, and grain fields	High (foraging only); additional assessment included in Section 2.4.1.7 of the document
Golden eagle *Aquila chrysaetos*	USFWS, CDFW	BGEPA/ SFP	Species is an uncommon permanent resident and migrant throughout California, except center of Central Valley.	Open woodlands and oak savannahs, grasslands, chaparral, sagebrush flats; nests on steep cliffs or medium to tall trees	Low (foraging only); habitat is suboptimal and disturbed
California black rail *Laterallus jamaicenis coturniculus*	CDFW	–/ST, SFP	Northern San Francisco Bay area (primarily San Pablo and Suisun bays) and Sacramento-San Joaquin Delta	Large tidally-influenced marshes with saline to brackish water, typically with a high proportion of pickleweed (*Salicornia virginica*); also can be associated with bulrush (*Schoenoplectus* spp.), cattail (*Typha* spp.), or rushes (*Juncus* spp.); peripheral vegetation at and above mean high higher water necessary to protect nesting birds during extremely high tides	Low; only marsh habitat within the Project Area is too small to provide suitable habitat; no observations within 15 mi of the Project Area (CDFW 2025c)
California Ridgway's rail *Rallus obsoletus obsoletus*	USFWS	FE/SE, SFP	Predominantly in the tidal marshes of the San Francisco estuary: South San Francisco Bay, North San Francisco Bay, San Pablo Bay, and sporadically throughout the Suisun Marsh area east to Browns Island	Salt and brackish water marshes, typically dominated by pickleweed (*Salicornia virginica*) and Pacific cordgrass (*Spartina foliosa*).	None; Project Area is outside the species' known current range (USFWS 2013)
Greater sandhill crane *Grus canadensis tabida*	CDFW	–/ST, SFP	Winter visitor and migrant; scattered locations in the Central Valley; breeds at high elevation in meadows of the Sierra Nevada and deserts in the northeastern corner of California.	Forages in freshwater marshes and grasslands as well as harvested rice fields, corn stubble, barley, and newly planted grain fields	High (winter only/non-breeding); additional assessment included in Section 2.4.1.7 of the document
Lesser sandhill crane *Grus canadensis canadensis*	CDFW	–/SSC	Winter visitor and migrant in scattered Central Valley locations; breeds in northern Canada and Alaska.	Forages in freshwater marshes and grasslands as well as harvested rice fields, corn stubble, barley, and newly planted grain fields	High (winter only/non-breeding); additional assessment included in Section 2.4.1.7 of the document

Common name ***Scientific name***	**Query sources**	**Status[a]** **Federal/ State**	**Distribution in California**	**Habitat association**	**Likelihood to occur in Project Area**
Mountain plover *Charadris montanus*	CDFW	–/SSC	Winter visitor; found in the Central Valley south of Yuba County, along the coast in parts of San Luis Obispo, Santa Barbara, Ventura, and San Diego counties; parts of Imperial, Riverside, Kern, and Los Angeles counties	Occupies open plains or rolling hills with short grasses or very sparse vegetation; nearby bodies of water are not needed; may use newly plowed or sprouting grain fields	Low (foraging only); limited, only marginally suitable habitat within the Project Area; no observations within 10 mi of Project Area (CDFW 2025c).
Western burrowing owl *Athene cunicularia hypugaea*	CDFW	–/SCE, SSC	Year-round resident throughout much of the state; Central Valley, northeastern plateau, southeastern deserts, and coastal areas; rare along south coast	Level, open, dry, heavily grazed or low- stature grassland or desert vegetation with available burrows	Moderate; additional assessment included in Section 2.4.1.7 of the document
Long-eared owl *Asio otus*	CDFW	–/SSC	Uncommon resident throughout the state, does not occupy the Central Valley and Southern California deserts	Riparian habitat; nests in dense vegetation close to open grassland, meadows, riparian, or wetland areas for foraging	None; Project Area is outside the species' known range (CDFW 2021)
Short-eared owl *Asio flammeus*	CDFW	–/SSC	Year-round resident in certain areas; breeding in California episodic and a widespread winter migrant, found primarily in the Central Valley, in the western Sierra Nevada foothills, and along the coastline	Salt or freshwater marshlands, ungrazed grasslands, old pastures, and irrigated alfalfa or grain fields. Feeds on small mammals and nests on ground.	Moderate (foraging only); additional assessment included in Section 2.4.1.7 of the document
Loggerhead shrike *Lanius ludovicianus*	CDFW	–/SSC	Year-round resident in most of California except for the forested coastal slope and the high elevations of the Sierra Nevada, southern Cascade, and Transverse Ranges	Open shrubland or woodlands with short vegetation and and/or bare ground for hunting; some tall shrubs, trees, fences, or power lines for perching; typically nest in isolated trees or large shrubs	High; additional assessment included in Section 2.4.1.7 of the document
Bank swallow *Riparia riparia*	CDFW	–/ST	Summer resident; occurs along the Sacramento River from Tehama County to Sacramento County, along the Feather and lower American rivers; and in the plains east of the Cascade Range in Modoc, Lassen, and northern Siskiyou counties; small populations near the coast from San Francisco County to Monterey County	Nests in vertical bluffs or banks, usually adjacent to water, where the soil consists of sand or sandy loam	None; Project Area is outside the species' known range (CDFW 2021)
Yellow warbler *Setophaga petechia*	CDFW	–/SSC	Summer resident; nests in most of California, except most of the Central Valley, high Sierras, and Mojave and Colorado deserts	Deciduous riparian woodland with an open canopy and close to water, along streams or wet meadows	Moderate (foraging only); additional assessment included in Section 2.4.1.7 of the document
Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*	CDFW	–/SSC	San Francisco Bay region	Brackish marsh, riparian woodland/swamp, freshwater marsh, and salt marsh often near upland habitats	None; Project Area is outside the species' known range (Shuford and Gardali 2008)
Yellow-breasted chat *Icteria virens*	CDFW	–/SSC	Uncommon summer resident and migrant in coastal California and in foothills of the Sierra Nevada	Early-successional riparian habitats with a dense shrub layer and an open canopy	Moderate; (foraging only); additional assessment included in Section 2.4.1.7 of the document
Grasshopper sparrow *Ammodramus savannarum*	CDFW	–/SSC	Summer resident; nests in Mendocino, Trinity, and Tehama counties south, west of the Cascade–Sierra Nevada axis and southeastern deserts, to San Diego County	Typically found in moderately open grasslands with scattered shrubs	Low; only sub-optimal habitat present within the Project Area, no historical CNDDB observations within 20 mi (CDFW 2025c)
Song sparrow ("Modesto" population) *Melospiza melodia*	CDFW	–/SSC	Year-round resident; north-central portion of the Central Valley	Emergent freshwater marshes, riparian willow thickets, and riparian forests	High; additional assessment included in Section 2.4.1.7 of the document
Suisun song sparrow *Melospiza melodia maxillaris*	CDFW	–/SSC	Resident of Suisun Bay	Brackish-water marshes	None; Project Area is outside the species' known range (CDFW 2021)
Tricolored blackbird *Agelaius tricolor*	CDFW	–/ST, SSC	Permanent resident, but makes extensive migrations both in breeding season and winter; common locally throughout Central Valley and in coastal areas in and south of Sonoma County	Feeds in grasslands and agriculture fields; nesting habitat components include open accessible water, a protected nesting substrate (including flooded or thorny vegetation), and a suitable nearby foraging space with adequate insect prey	High (foraging only); additional assessment included in Section 2.4.1.7 of the document

Common name *Scientific name*	Query sources	Status[a] Federal/ State	Distribution in California	Habitat association	Likelihood to occur in Project Area
Yellow-headed blackbird *Xanthocephalus xanthocephalus*	CDFW	–/SSC	Primarily a migrant and summer resident, though small numbers remain in winter; Central Valley, northeastern California, central and southern coasts, and southern deserts	Breeds almost entirely in open marshes with relatively deep water and tall emergent vegetation, such as bulrush (*Schoenoplectus* spp.) or cattails (*Typha* spp.); nests are typically in moderately dense vegetation; forage within wetlands and surrounding grasslands and croplands	Moderate (foraging only); additional assessment included in Section 2.4.1.7 of the document
Mammals					
Riparian brush rabbit *Sylvilagus bachmani riparius*	CDFW	FE/SE	Single, known extant population restricted to the Stanislaus River in Caswell Memorial State Park	Brushy understory of valley riparian forests	None; Project Area is outside the species' known range (CDFW 2020)
Western red bat *Lasiurus frantzii*	CDFW	–/SSC	Near the Pacific Coast, Central Valley, and the Sierra Nevada	Roosts in foliage, primarily in riparian trees, such as sycamores and cottonwoods, while less in shrubs; woodlands near streams, fields and orchards; feeds over a wide variety of habitats including grasslands, shrublands, open woodlands and forests, and croplands	Moderate (foraging only); additional assessment included in Section 2.4.1.7 of the document
San Joaquin kit fox *Vulpes macrotis mutica*	CDFW	FE/ST	San Joaquin Valley floor and surrounding foothills of the coastal ranges, Sierra Nevada, and Tehachapi mountains	Annual grasslands or open areas dominated by scattered brush, shrubs, and scrub	None; Project Area is outside the species' known range (CDFW 2021)
American Badger *Taxidea taxus*	CDFW	–/SSC	Throughout the state except in the humid coastal forests of Del Norte County and the northwest portion of Humboldt County	Shrubland, open grasslands, fields, and alpine meadows with friable soils	Low; the Project Area contains only suboptimal suitable habitat and lacks friable soils; closest observations are approximately 15 mi southwest near Antioch in 2002, 2006, 2007 (CDFW 2025c)

[a] Status codes:

Federal
FE = Listed as endangered under the federal Endangered Species Act
FT = Listed as threatened under the federal Endangered Species Act
FPT = Federally proposed as threatened
FC = Federal candidate species
FD = Federally delisted
FSC = Federal species of concern
BGEPA = Federally protected under the Bald and Golden Eagle Protection Act

State
SE = Listed as Endangered under the California Endangered Species Act
ST = Listed as Threatened under the California Endangered Species Act
SPT = Proposed as Threatened under the California Endangered Species Act
SCE = State Candidate Endangered
SSC = CDFW Species of Special Concern
SFP = CDFW Fully Protected species

Appendix D

Comprehensive List of Plant Species Documented during Special-status Botanical Surveys for the Project

Table D-1. Comprehensive list of plant species documented during special-status botanical surveys for the Project.

Scientific name	Common name	Family	Nativity	Cal-IPC rating[1]
Abutilon theophrasti	velvet-leaf	Malvaceae	Introduced	
Achillea millefolium	common yarrow	Asteraceae	Native	
Agrostis avenacea	Pacific bent grass	Poaceae	Introduced	Limited
Alnus rhombifolia	white alder	Betulaceae	Native	
Alternanthera philoxeroides	alligator weed	Amaranthaceae	Introduced	High
Amaranthus albus	tumbleweed	Amaranthaceae	Introduced	
Amaranthus blitoides	procumbent pigweed	Amaranthaceae	Native	
Amaranthus retroflexus	redroot pigweed	Amaranthaceae	Introduced	
Ammannia coccinea	valley redstem	Lythraceae	Native	
Amsinckia menziesii	common fiddleneck, small-flowered fiddleneck	Boraginaceae	Native	
Apocynum cannabinum	hemp dogbane	Apocynaceae	Native	
Artemisia douglasiana	mugwort	Asteraceae	Native	
Atriplex prostrata	fat-hen	Chenopodiaceae	Introduced	
Avena fatua	wild oat	Poaceae	Introduced	Moderate
Azolla filiculoides	mosquitofern	Azollaceae	Native	
Baccharis pilularis	coyote brush	Asteraceae	Native	
Bidens frondosa	sticktight	Asteraceae	Native	
Bromus diandrus	ripgut grass	Poaceae	Introduced	Moderate
Bromus hordeaceus	soft chess	Poaceae	Introduced	Limited
Bromus rubens	red brome	Poaceae	Introduced	High
Calandrinia menziesii	red maids	Montiaceae	Native	
Calystegia sepium	hedge bindweed	Convolvulaceae	Native	
Capsella bursa-pastoris	shepherd's purse	Brassicaceae	Introduced	
Carduus pycnocephalus subsp. *pycnocephalus*	Italian thistle	Asteraceae	Introduced	Moderate
Centaurea solstitialis	yellow star-thistle	Asteraceae	Introduced	High
Cephalanthus occidentalis	California button willow	Rubiaceae	Native	
Chenopodium album	lamb's quarters	Chenopodiaceae	Introduced	
Cirsium vulgare	bull thistle	Asteraceae	Introduced	Moderate
Claytonia perfoliata	miner's lettuce	Montiaceae	Native	
Conium maculatum	poison hemlock	Apiaceae	Introduced	Moderate
Convolvulus arvensis	bindweed, orchard morning-glory	Convolvulaceae	Introduced	
Cotula coronopifolia	brass-buttons	Asteraceae	Introduced	Limited
Cynodon dactylon	Bermuda grass	Poaceae	Introduced	Moderate
Cyperus eragrostis	tall flatsedge	Cyperaceae	Native	
Cyperus erythrorhizos	redroot flatsedge	Cyperaceae	Native	
Cyperus esculentus var. *leptostachyus*	yellow nutsedge	Cyperaceae	Native	
Dittrichia graveolens	stinkwort	Asteraceae	Introduced	Moderate
Dysphania ambrosioides	Mexican tea	Chenopodiaceae	Introduced	
Echinochloa crus-galli	barnyardgrass	Poaceae	Introduced	
Eichhornia crassipes	common water hyacinth	Pontederiaceae	Introduced	High
Elymus triticoides	beardless wild-rye	Poaceae	Native	
Epilobium brachycarpum	tall annual willowherb	Onagraceae	Native	
Epilobium ciliatum	fringed willowherb	Onagraceae	Native	

Scientific name	Common name	Family	Nativity	Cal-IPC rating[1]
Equisetum laevigatum	smooth scouring rush	Equisetaceae	Native	
Erigeron bonariensis	flax-leaved horseweed	Asteraceae	Introduced	
Erigeron canadensis	horseweed	Asteraceae	Native	
Erodium cicutarium	redstem filaree	Geraniaceae	Introduced	Limited
Erodium moschatum	greenstem filaree	Geraniaceae	Introduced	
Erythranthe guttata	common monkeyflower, seep monkeyflower	Phrymaceae	Native	
Eschscholzia californica	California poppy	Papaveraceae	Native	
Euthamia occidentalis	western goldenrod	Asteraceae	Native	
Festuca myuros	rattail sixweeks grass	Poaceae	Introduced	Moderate
Festuca perennis	rye grass	Poaceae	Introduced	Moderate
Foeniculum vulgare	fennel	Apiaceae	Introduced	Moderate
Galium aparine	goose grass	Rubiaceae	Native	
Geranium dissectum	cutleaf geranium	Geraniaceae	Introduced	Limited
Gnaphalium palustre	western marsh cudweed	Asteraceae	Native	
Grindelia camporum	Great Valley gumweed	Asteraceae	Native	
Heliotropium curassavicum var. *oculatum*	seaside heliotrope, alkali heliotrope	Heliotropiaceae	Native	
Helminthotheca echioides	bristly ox-tongue	Asteraceae	Introduced	Limited
Hirschfeldia incana	shortpod mustard	Brassicaceae	Introduced	Moderate
Hordeum brachyantherum	meadow barley	Poaceae	Native	
Hordeum marinum subsp. *gussoneanum*	Mediterranean barley	Poaceae	Introduced	Moderate
Hordeum murinum	wall barley	Poaceae	Introduced	Moderate
Hypochaeris glabra	smooth cat's-ear	Asteraceae	Introduced	Limited
Iris pseudacorus	paleyellow iris	Iridaceae	Introduced	Limited
Juglans hindsii	Northern California black walnut	Juglandaceae	Native	
Juncus bufonius	toad rush	Juncaceae	Native	
Juncus effusus	soft or lamp rush	Juncaceae	Native	
Juncus patens	spreading rush	Juncaceae	Native	
Lactuca serriola	prickly lettuce	Asteraceae	Introduced	
Lasthenia glabrata subsp. *glabrata*	yellow-ray goldfields	Asteraceae	Native	
Lathyrus jepsonii var. californicus	California pea	Fabaceae	Native	
Leersia oryzoides	rice cutgrass	Poaceae	Native	
Lemna	duckweed	Araceae	Native	
Lepidium didymum	lesser swine cress	Brassicaceae	Introduced	
Lepidium latifolium	perennial pepperweed	Brassicaceae	Introduced	High
Leptochloa fusca subsp. *fascicularis*	bearded sprangletop	Poaceae	Native	
Ligustrum lucidum	Chinese privet	Oleaceae	Introduced	Limited
Limosella acaulis	Owyhee mudwort	Scrophulariaceae	Native	
Ludwigia hexapetala	Uruguayan primrose-willow	Onagraceae	Introduced	High
Lycopus americanus	American water horehound	Lamiaceae	Native	
Lythrum hyssopifolia	hyssop loosestrife	Lythraceae	Introduced	Moderate

Scientific name	Common name	Family	Nativity	Cal-IPC rating[1]
Malva parviflora	cheeseweed, little mallow	Malvaceae	Introduced	
Malvella leprosa	alkali-mallow, white-weed	Malvaceae	Native	
Matricaria discoidea	pineapple weed, rayless chamomile	Asteraceae	Native	
Medicago polymorpha	California burclover	Fabaceae	Introduced	Limited
Melilotus albus	white sweetclover	Fabaceae	Introduced	
Persicaria hydropiperoides	false waterpepper	Polygonaceae	Native	
Persicaria lapathifolia	willow weed	Polygonaceae	Native	
Persicaria maculosa	lady's thumb	Polygonaceae	Introduced	
Persicaria punctata	dotted smartweed	Polygonaceae	Native	
Phalaris minor	little-seeded canary grass	Poaceae	Introduced	
Phragmites australis	common reed	Poaceae	Native	
Plagiobothrys	popcornflower	Boraginaceae	Native	
Poa annua	annual blue grass	Poaceae	Introduced	
Polygonum aviculare	knotweed, knotgrass	Polygonaceae	Introduced	
Polygonum aviculare subsp. *depressum*	oval-leaf knotweed	Polygonaceae	Introduced	
Polypogon monspeliensis	rabbitsfoot grass	Poaceae	Introduced	
Polypogon viridis	water beard grass	Poaceae	Introduced	
Populus fremontii subsp. *fremontii*	Fremont cottonwood	Salicaceae	Native	
Portulaca oleracea	purslane	Portulacaceae	Introduced	
Potentilla rivalis	brook or river cinquefoil	Rosaceae	Native	
Pseudognaphalium luteoalbum	Jersey cudweed	Asteraceae	Introduced	
Ranunculus sceleratus var. *sceleratus*	cursed buttercup	Ranunculaceae	Introduced	
Raphanus sativus	radish	Brassicaceae	Introduced	Limited
Rorippa curvipes	bluntleaf yellowcress	Brassicaceae	Native	
Rorippa curvisiliqua	curvepod yellowcress	Brassicaceae	Native	
Rorippa palustris	bog yellowcress	Brassicaceae	Native	
Rubus armeniacus	Himalayan blackberry	Rosaceae	Introduced	High
Rumex conglomeratus	clustered dock	Polygonaceae	Introduced	
Rumex crispus	curly dock	Polygonaceae	Introduced	Limited
Salix exigua	narrowleaf willow	Salicaceae	Native	
Salix gooddingii	Goodding's black willow	Salicaceae	Native	
Salix laevigata	red willow	Salicaceae	Native	
Salvia columbariae	chia	Lamiaceae	Native	
Schoenoplectus acutus var. *occidentalis*	common tule	Cyperaceae	Native	
Schoenoplectus californicus	southern bulrush	Cyperaceae	Native	
Senecio vulgaris	common groundsel	Asteraceae	Introduced	
Sesbania punicea	scarlet sesban	Fabaceae	Introduced	High
Silybum marianum	blessed milkthistle	Asteraceae	Introduced	Limited
Sisymbrium	mustard	Brassicaceae	Introduced	
Solanum americanum	American black nightshade	Solanaceae	Native	
Sonchus asper subsp. *asper*	prickly sow thistle	Asteraceae	Introduced	
Sonchus oleraceus	common sow thistle	Asteraceae	Introduced	

Scientific name	Common name	Family	Nativity	Cal-IPC rating[1]
Sorghum bicolor	sorghum	Poaceae	Introduced	
Sorghum halepense	Johnson grass	Poaceae	Introduced	
Spergularia marina	saltmarsh sand-spurrey	Caryophyllaceae	Native	
Spergularia rubra	red sand-spurrey	Caryophyllaceae	Introduced	
Stellaria media	common chickweed	Caryophyllaceae	Introduced	
Stipa pulchra	purple needle grass	Poaceae	Native	
Symphyotrichum subulatum	annual saltmarsh aster	Asteraceae	Native	
Taraxacum officinale	common dandelion	Asteraceae	Introduced	
Tribulus terrestris	puncturevine	Zygophyllaceae	Introduced	Limited
Trifolium variegatum	whitetip clover	Fabaceae	Native	
Typha angustifolia	narrow-leaved cattail	Typhaceae	Native OR Introduced	
Typha domingensis	southern cattail	Typhaceae	Native	
Typha latifolia	broad-leaved cattail	Typhaceae	Native	
Ulmus	elm	Ulmaceae	Introduced	
Urtica dioica	stinging nettle	Urticaceae	Native	
Urtica urens	dwarf nettle	Urticaceae	Introduced	
Verbena bonariensis	purpletop vervain	Verbenaceae	Introduced	
Veronica peregrina subsp. *xalapensis*	purslane speedwell	Plantaginaceae	Native	
Washingtonia robusta	Mexican fan palm	Arecaceae	Introduced	Moderate
Xanthium orientale	common cocklebur	Asteraceae	Native	
Zantedeschia aethiopica	calla-lily	Araceae	Introduced	Limited

[1] Cal-IPC ratings (Cal-IPC 2025):

- High — Species having severe ecological impacts on physical processes, plant and animal communities, and vegetation structure.
- Moderate — Species having substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure.
- Limited — Species having minor ecological impacts on a statewide level or for which there is not enough information to justify a higher score.