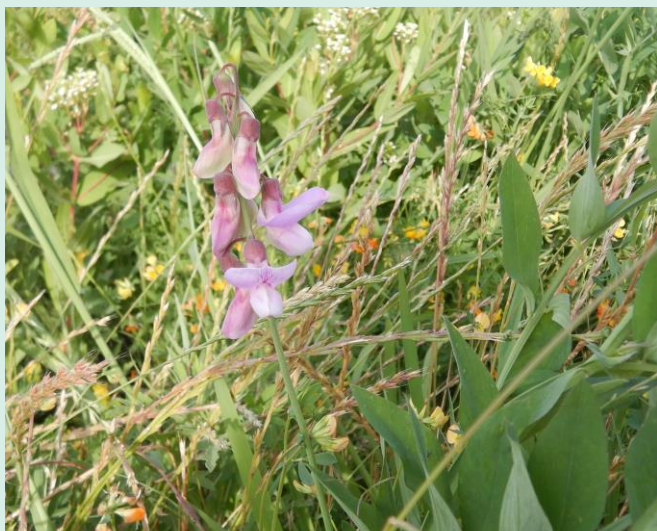


FINAL ◦ JUNE 2024

Initial Study/Mitigated Negative Declaration Hastings Tract Pipe Replacement Project



PREPARED FOR

Reclamation District No. 2060
Hastings Tract
Solano County, CA

PREPARED BY

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Suggested citation:

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Cover photos (counterclockwise from top left): Delta tule pea (*Lathyrus jepsonii*) along Hastings Cut, June 2023; tide gates on Hastings Cut, April 2023; southern end of Hastings Cut, April 2023; Lindsey Slough from Hastings Tract, April 2023.

PROJECT SUMMARY

Hastings Tract Pipe Replacement Project	
Lead agency	Reclamation District No. 2060
Contact person and phone number	Michael N. Kynett, PE Project Engineer MBK Engineers 455 University Avenue, Suite 100 Sacramento, CA 95825 kynett@mbkengineers.com Office: (916) 437-7553 Cell: (916) 799-0641
Project location	Unit 3 Cache Slough and Unit 1 Lindsey Slough levees along Hastings Cut, Hastings Tract, Solano County
Zoning	Agriculture
Description of Project	Removal of two tide gates from the Unit 3 Cache Slough levee at the northeastern end of Hastings Cut and installation of new twin 48-inch tide gates connecting Hastings Cut to the Unit 1 Lindsey Slough levee at its southwestern end
Surrounding land uses and setting	The Project Area is surrounded by land on Hastings Tract that is primarily used for agriculture and recreation, and Cache and Lindsey sloughs, which are used for recreation and transportation.
Other public agencies whose approval is required	• California Department of Water Resources (funding) • California Department of Fish and Wildlife (Lake and Streambed Alteration Agreement) • Central Valley Regional Water Quality Control Board (Clean Water Act Section 401 permit) • U.S. Army Corps of Engineers (Clean Water Act Section 404 permit) • U.S. Army Corps of Engineers (Section 408 permission) • Central Valley Flood Protection Board (Encroachment Permit) • California State Lands Commission (<i>if a lease is required</i>)

PROPOSED MITIGATED NEGATIVE DECLARATION

Project: Hastings Tract Pipe Replacement Project

Lead Agency: Reclamation District No. 2060

Project Location: Unit 3 Cache Slough and Unit 1 Lindsey Slough levees along Hastings Cut, Hastings Tract, Solano County

Project Description: To maintain levee integrity and provide long-term flood protection to Hastings Tract, Reclamation District No. 2060 is planning to install new twin 48-inch diameter tide gates (pipes) in the Unit 1 Lindsey Slough levee where they will connect Hastings Cut with Lindsey Slough, and existing features connecting Hastings Cut and Cache Slough through the Unit 3 Cache Slough levee will be removed or abandoned in place.

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. 2060 has determined that the Project, including conservation measures that are part of the Project design and additional mitigation measures, will not have significant effects on the environment. This conclusion is supported by the following findings:

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

Mandatory Findings of Significance:

- With incorporation of mitigation measures, the Project will 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.
- With incorporation of mitigation measures, the Project will not have environmental effects that are individually limited, but cumulatively considerable.
- With incorporation of mitigation measures, the Project will not have environmental effects which would cause substantial adverse effects on human beings, either directly or indirectly.

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 will ensure that the potential environmental impacts of the Project

are less than significant. Reclamation District No. 2060 has agreed to implement each of the identified mitigation measures, which will 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. 2060 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. 2060. The lead agency further finds that the Project mitigation measures will 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:



Reclamation District No. 2060

August 6, 2024

Date

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Appendix B.	Database Query Results for Special-status Plant Species and Sensitive Natural Communities in the Hastings Tract Pipe Replacement Project Region
Appendix C.	Database Query Results for Special-status Wildlife Species and Sensitive Natural Communities in the Hastings Tract Pipe Replacement Project Region
Appendix D.	Comprehensive List of Plant Species Documented during Special-status Plant Surveys for the Hastings Tract Pipe Replacement Project
Appendix E.	Public Comments and Responses on the Draft IS/MND for the Hastings Tract Pipe Replacement Project
Appendix F.	Hastings Tract Pipe Replacement Project Mitigation Monitoring and Reporting Program

1 INTRODUCTION

Reclamation District No. 2060 (District) is planning to install new twin 48-inch-diameter tide gates (pipes) in the Unit 1 Lindsey Slough levee where they will connect Hastings Cut with Lindsey Slough, and the existing pipes connecting Hastings Cut and Cache Slough through the Unit 3 Cache Slough levee and associated appurtenances will be removed or abandoned in place (Project). The connection and flow of water between Cache Slough and Hastings Cut will not be maintained; instead, a new connection will be established to convey water flow between Lindsey Slough and Hastings Cut. 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.

1.1 Project Purpose

The Project has two primary purposes: (1) to improve long-term flood protection of Hastings Tract by replacing aging infrastructure through the levee and (2) to improve water quality and avoid environmental impacts to Cache Slough. The existing pipes provide both drainage and irrigation flow between Hastings Cut and Cache Slough but show signs of significant, irreparable distress in their current configuration. Pipe failure would cause damage to the Unit 3 Cache Slough levee and, depending on water surface elevation, could lead to a levee breach or flooding of the tract.

1.2 Project Location

Hastings Tract is in the Sacramento-San Joaquin River Delta (Delta), approximately 25 miles southwest of Sacramento, in Solano County, California. Hastings Cut runs roughly northeast-southwest through the tract, connecting to Cache Slough to the north via pipes through the tract's perimeter levee (Figure 1-1). Project work will be centered around these pipes as they are removed from the Cache Slough levee and new pipes are installed in the Lindsey Slough levee.

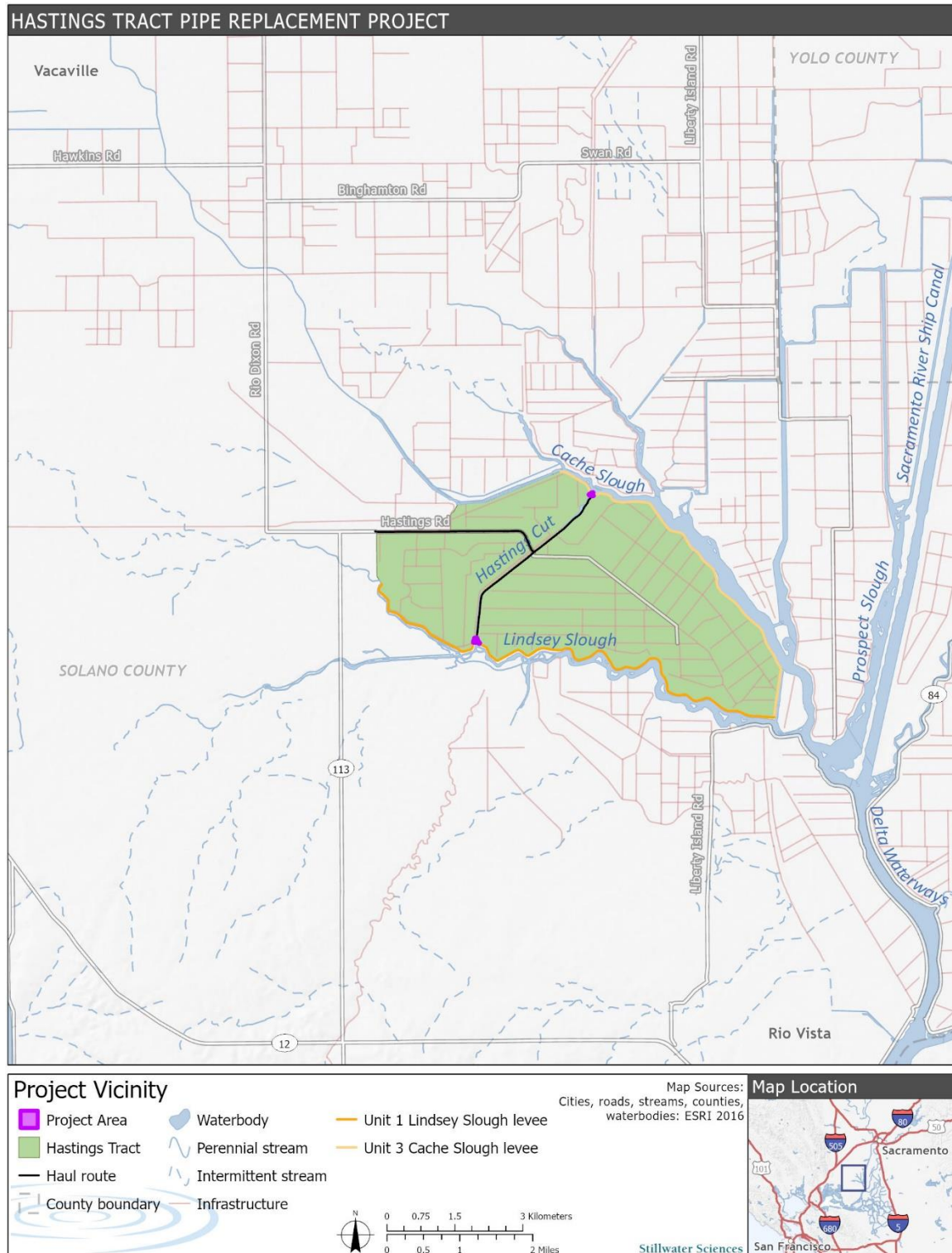


Figure 1-1. Hastings Tract Pipe Replacement Project location and surrounding vicinity.

1.3 Project Area

The Project Area encompasses two distinct sites, the existing pipe location on Cache Slough/Hastings Cut and the proposed location of new pipes on Lindsey Slough/Hastings Cut (Figure 1-2). The Project Area at the existing pipe location on Cache Slough/Hastings Cut aligns with the construction footprint and includes the grading limits, the portions of Cache Slough and Hastings Cut enclosed by temporary turbidity control devices, and a staging area. At the new pipe location on Lindsey Slough/Hastings Cut, the Project Area includes the construction footprint, which includes the grading limits and areas enclosed by the temporary cofferdams in Lindsey Slough and Hastings Cut, and a staging area on the landside of the Lindsey Slough levee. The Project's haul route is along approximately 5.5 miles of Hastings Cut Road and Hastings Road before joining State Route 113 (Figure 1-2).

1.4 Project Description

1.4.1 Construction

1.4.1.1 Site preparation

Site preparation activities will include stripping, clearing, and grubbing upland vegetation within the construction footprint and staging area. Temporary ramps will also be constructed to connect the staging area to the levee crown road along Hastings Cut. Temporary access ramps and staging areas would be located within the levee and adjacent farmland.

1.4.1.2 Pipe removal/abandonment on Cache Slough

Temporary sheet pile cofferdams will be installed inland near Hastings Cut and Cache Slough to ensure a contained work area for pipe removal and abandonment. Sheet pile cofferdams will be installed using a vibratory hammer fitted to an excavator. Silt curtains will be installed in Hastings Cut and Cache Slough to ensure that any sediment potentially resulting from Project activities will be contained. The levee will then be degraded to at least 1 foot (ft) below the existing pipes, and excavated fill material will be stockpiled on site. The existing pipe structure (pipes and appurtenances) will be completely removed; in the event a section of pipe could not be removed it would be backfilled with cement. The excavated area will be backfilled with material stockpiled during excavation, and the levee will be reconstructed to its original grade of approximately 6:1 (horizontal to vertical). Following levee reconstruction, sheet pile cofferdams will be removed, and the levee will be seeded with a native seed mix.

1.4.1.3 Pipe installation on Lindsey Slough

Temporary sheet pile cofferdams will be installed in Hastings Cut and Lindsey Slough to provide a dry work area for pipe installation (Figure 1-2). Cofferdams are anticipated to be constructed by installing a sheet pile wall using a vibratory hammer fitted to an excavator. The area within the cofferdams will be dewatered, and the levee will be degraded to at least 2.0 ft below the proposed pipes. The new 48-inch welded-steel gravity pipes and associated appurtenances (e.g., gates, risers, valves) will be installed with headwalls and gate structures at each end. Rock slope protection 2 ft in depth will extend 17 ft and 10 ft from the inlet/outlet structures in Hastings Cut and Lindsey Slough, respectively, to minimize the potential for erosion. The levee surrounding the pipes will be backfilled with levee embankment fill and reconstructed to its original grade, which varies between approximately 6:1 (horizontal to vertical) near its toe and 3:1 (horizontal to vertical) near its crown. Following levee reconstruction, cofferdams will be removed, and the levee will be seeded with a native seed mix.



Figure 1-2a. Hastings Tract Pipe Replacement Project Area, northern portion along Cache Slough (page 1 of 2).

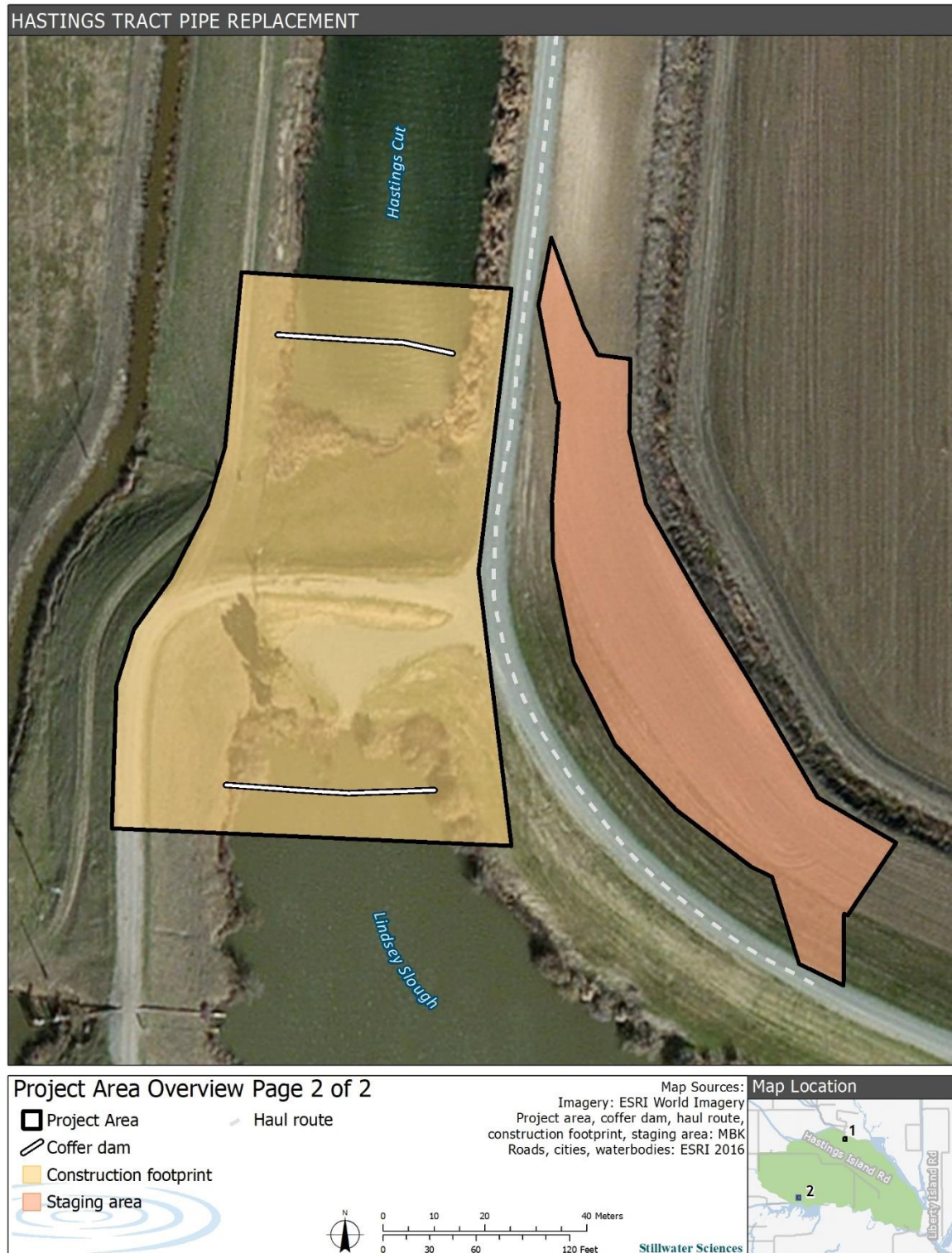


Figure 1-2b. Hastings Tract Pipe Replacement Project Area, southern portion along Lindsey Slough (page 2 of 2).

1.4.2 Staging areas

During pipe removal along the Cache Slough levee, equipment, vehicles, and construction materials will be staged on the levee within the construction footprint (Figure 1-2b). During pipe installation along Lindsey Slough, a staging area will be located along the landside levee toe east of the construction footprint (Figure 1-2a); the staging area will be accessed via temporary ramps at its northern and southern ends, also located along the levee and adjacent farmland.

1.4.3 Equipment

Table 1-1 provides a list of expected equipment for use during each phase of Project implementation.

Table 1-1. Equipment list by work phase for the Hastings Tract Pipe Replacement Project.

Work phase	Equipment type	Number	Estimated days
<i>Entire Project Area</i>			
Throughout Project construction	Water truck	1	66
	Front end loader	1	44
	High lift	1	33
	Foreman/super pick-up trucks	2	66
<i>Pipe Removal/Abandonment on Cache Slough</i>			
Site preparation	Dozer	1	1
Cofferdam installation	Excavator ¹	2	5
	Tractor and box grader	3	5
	Dozer	1	5
Levee excavation and pipe removal	Excavator	2	5
	Tractor and box grader	1	5
	Dozer	1	5
	Pump	1	5
Levee replacement	Excavator	1	10
	Tractor and box grader	3	10
	Dozer	1	10
	Compactor	1	10
	Pump	1	10
<i>Pipe Installation on Lindsey Slough</i>			
Site preparation	Dozer	1	1
Cofferdam installation	Excavator ¹	2	5
	Tractor and box grader	3	5
	Dozer	1	5
Levee excavation	Excavator	1	5
	Tractor and box grader	3	5
	Dozer	1	5
	Pump	1	5
Pipe installation	Excavator	2	10
	Pump	1	10
Levee replacement	Excavator	1	10
	Tractor and box grader	3	10
	Dozer	1	10
	Compactor	1	10
	Pump	1	10

¹ At least one excavator will be fitted with a vibratory hammer for sheet pile installation.

1.4.4 Schedule

Project construction is expected to take approximately 66 working days between May and November 2025, with in-water work planned between August 1 and November 30. A typical workday is assumed to be 8 hours per day, during daylight hours. Work will occur Monday through Saturday with light work (e.g., maintenance of equipment) on Sundays if needed.

1.4.5 Conservation measures

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

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

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

CM-2. If any wildlife is observed in the Project footprint, activities within the immediate vicinity will cease and the animal will be allowed to move out of the area on its own. Prior to beginning Project activities each day or before moving vehicles or equipment, staging areas as well as areas under and around vehicles and equipment will be scanned for wildlife.

CM-3. Prior to Project construction, a Stormwater Pollution Prevention Plan (SWPPP) will be developed that will include, but not be limited to, the following BMPs to avoid and minimize potential impacts on waters from erosion:

- a) Construction will occur only during dry periods. Dry periods are defined as: (1) less than 0.25 inch of precipitation during the preceding 24 hours, and (2) no precipitation falling during active construction.
- b) Prior to storm events, all construction activities will cease, and appropriate erosion control measures implemented.
- c) Soil, silt, or other organic materials will not be placed, stockpiled, or stored where such materials could pass into surface water or surface water drainage courses during unexpected rain events.
- d) All areas disturbed by Project activities will be protected from washout or erosion prior to the onset of the rainy season.

- e) All temporarily affected areas will be restored to pre-construction contours and conditions upon completion of construction activities. Any areas with bare ground will be re-seeded with a native seed mix.
- f) Prior to initiation of any waterside work, erosion control measures will be utilized throughout all phases of operation where silt and/or earthen fill threaten to enter waters of the U.S. and/or state.

CM-4. The Project SWPPP will include, but not be limited to, the following BMPs to avoid and minimize potential effects from hazards and hazardous materials:

- a) No potentially hazardous materials will be stored in a location where there is potential to enter any waterway and/or contaminate aquatic resources.
- b) All construction materials with the potential to pollute runoff will be handled with care and stored under cover or surrounded by berms during wet weather or when rain is forecast.
- c) An effort will be made to store only the amount of a potentially hazardous product necessary to complete the job.
- d) Materials, fuels, liquids and lubricants, and equipment supplies stored on site will be stored in a neat, orderly manner, in their appropriate containers, with the original manufacturer's label, and, if possible, in an enclosure.
- e) Machinery stored on site will have pans or absorbent mats placed underneath potential leak areas.
- f) Any hazardous materials will be stored and labeled according to local, state, and federal regulations.
- g) If drums must be stored without overhead cover, they will be stored at a slight angle to reduce corrosion and ponding of rainwater on the lids.
- h) Substances will not be mixed with one another unless recommended by the manufacturer.
- i) Manufacturer's recommendations for proper use and disposal of a product will be followed.
- j) Whenever possible, all of a product will be used before disposal of its container.
- k) If surplus product must be disposed of, the manufacturer's or the local and state recommended methods for proper disposal will be followed.

CM-5. The SWPPP developed for the Project will include, but not be limited to, the following measures to prevent, control, and minimize impacts from a spill of a hazardous, toxic, or petroleum substance during construction of the Project:

- a) Minor spills are those that can be controlled by on-site personnel. The following actions will occur upon discovery of a minor spill:
 - The spread of the spill will be contained.
 - If the spill occurs on impermeable surfaces, such as any temporary surfaces installed for pollution prevention during construction, it will be cleaned up using "dry" methods (e.g., absorbent materials, cat litter, rags).
 - If the spill occurs in permeable substrate areas, it will be immediately contained by constructing an earthen dike. The contaminated soil will be excavated and properly disposed of.
 - If the spill occurs during rain, the impacted area will be covered to avoid runoff, and appropriate cleanup steps will be taken after precipitation has ceased.
 - All steps taken to report and contain the spill will be recorded.

- b) On-site personnel should not attempt to control major spills until the appropriate and qualified emergency response staff have arrived at the site. Failure to report major spills can result in significant fines and penalties.
- If a major spill occurs, the Governor's Office of Emergency Services Warning Center will be notified at (800) 852-7550 in addition to local authorities.
 - For spills of federal reportable quantities, the National Response Center will also be notified at (800) 424-8802. The federal reportable spill quantity for petroleum products is any oil spill that: (1) violates applicable water quality standards, (2) causes a film or sheen upon or discoloration of a water surface or adjoining shoreline, or (3) causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines.
 - A written report will be sent to all notified authorities.
- c) Diesel fuel, oil, gasoline, and lubricants are considered petroleum products. These materials will be handled carefully to minimize their exposure to storm water. The risks in using petroleum products will be reduced by following these steps:
- Waste oil and other petroleum products will not be discharged into the ground or other water bodies.
 - Petroleum products will be stored in tightly sealed containers that are clearly labeled, in a covered area, and in an upland area or within prefabricated spill containment devices, earthen berms, or similar secondary containment features.
 - On-site vehicles will be monitored daily for fluid leaks and receive regular preventative maintenance to reduce the chance of leakage (e.g., check for and fix fuel oil leaks in construction vehicles on a regular basis). Oil, grease, or other fluids will be washed off at designated wash stations prior to entering the Project Area.
 - Bulk fuel or lubricating oil dispensers will have a valve that must be held open to allow the flow of fuel into construction vehicles. During fueling operations, the contractor will have personnel present to detect and contain spills.
- d) The following additional spill control and cleanup practices will be followed:
- Spills will be contained and cleaned up immediately after discovery.
 - Manufacturer's methods for spill cleanup of a material will be followed as described on the material safety data sheets (kept with product containers).
 - Materials and equipment needed for cleanup procedures will be kept readily available on site, either at an equipment storage facility or on the contractor's trucks. Equipment to be kept on site will include, but not be limited to, brooms, dust pans, shovels, granular absorbents, sand, sawdust, absorbent pads and booms, plastic and metal trash containers, gloves, and goggles.
 - On-site personnel will be made aware of cleanup procedures, the location of spill cleanup equipment, and proper disposal procedures.
 - Toxic, hazardous, or petroleum product spills required to be reported by regulations will be documented and a record of the spills will be kept with Project documents.

If a spill occurs that is reportable to the federal, state, or local agencies, the contractor will be responsible for making and recording the reports.

CM-6. The Project SWPPP will include actions to protect water quality in surrounding waterways. These actions will include but not be limited to:

- a) Sediment booms, silt curtains, or other appropriate turbidity control devices will be installed and maintained around in-water work areas not fully enclosed by a sheet pile cofferdam. Turbidity control devices will be inspected regularly, and any sediment removed from them shall be disposed of in designated locations.
- b) If sediment plumes are visible outside the turbidity control devices or sheet pile cofferdams, turbidity levels will be monitored. If turbidity levels exceed applicable water quality objectives, in-water work will be delayed until adequate turbidity control measures are in place.
- c) During in-water work, construction equipment will be operated from a barge, from the adjacent levee slopes, or in dewatered areas with a ground protection mat. The amount of time equipment is stationed, working, or traveling in aquatic habitat will be minimized.

CM-7. The following measures will be implemented to reduce the potential for fire:

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

1.4.6 Mitigation measures

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

MM-1. All contractors and equipment operators will be provided a Worker Environmental Awareness Program training about the environmental resources of the Project Area, including special-status plants, fish, and wildlife species with potential to occur within the Project Area, and required protection measures. Workers will be informed about the presence, life history, and habitat requirements of all special-status species that may be affected by Project activities. Training will also include information on state and federal laws protecting plants, wildlife, fish, nesting birds, cultural resources, and water quality and the consequences of noncompliance with these laws. This training will be conducted prior to construction activities and will be provided to any new staff/contractors added during the Project.

MM-2. Prior to construction, special-status plant surveys will be conducted throughout the Project Area in accordance with *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants* (USFWS 2000) and *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018). Areas with special-status plants will be flagged or otherwise marked (e.g., staked, fenced) for avoidance, including a 10-ft-radius buffer. If work must be conducted within the 10-ft buffer, hand tools will be utilized to the extent possible. A biological monitor will be present during construction activities in areas within a 10-ft buffer of special-status plants to ensure impacts are avoided.

Where avoidance of special-status plants is not possible, a Mitigation and Monitoring Plan will be developed. The plan will describe in detail mitigation for these species on Hastings Tract and/or at an off-site mitigation bank. Mitigation site(s) and methods will be approved by the California Department of Fish and Wildlife (CDFW).

MM-3. A preconstruction survey focusing on the presence and distribution of northwestern pond turtles (*Actinemys marmorata*) and active breeding locations (i.e., nests) will be conducted within

the Project footprint and surrounding 300 ft no earlier than 7 days prior to initiation of activities, or if activities in an area have lapsed for more than 14 days. If an active northwestern pond turtle nest (nesting season is typically May through July) is discovered, the area will be noted, and a no-disturbance buffer will be established and flagged. The recommended no-disturbance buffer is 100 ft; however, the buffer will be determined by the biologist (and if needed, in consultation with CDFW) based on environmental conditions and activities being conducted nearby. No Project activities will 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.

MM-4. The following measures will be implemented for Project activities conducted between March 1 and September 15 to minimize impacts on Swainson's hawk (*Buteo swainsoni*):

- a) Survey timing and methodologies will 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 mile of the Project Area up to construction start date.
- b) As much as feasible, surveys will aim to be conducted during Period II, the early months of the nesting season (March 20 to April 5), to maximize the likelihood of detecting an active nest.
- c) If active nests are found, a no disturbance buffer of 0.25 mile will be established by a biologist in consideration of surrounding waterways. If Project-related activities need to be conducted within the no disturbance buffer, a biological monitor will oversee the work while monitoring the nest. Work will be allowed if individuals are not exhibiting agitated behavior such as defensive flights at intruders, getting up from a brooding position, or flying off the nest. The biological monitor will have the authority to stop work if the raptors are exhibiting agitated behavior. If the birds are tolerant of Project activities, consultation with CDFW will commence for the reduction of the no disturbance buffer.

MM-5. The following measures will be implemented to minimize potential impacts on giant garter snake 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) Initial site preparation and initial ground-disturbing activities within 200 ft of suitable giant garter snake habitat will occur between May 1 and October 1; this is the active period for the snake, lessening the potential for direct mortality. After all initial ground-disturbing work has begun within 200 ft of suitable giant garter snake habitat, ongoing work may continue beyond October 1.
- b) No more than 30 days prior to ground-disturbing activities, a qualified biologist with giant garter snake experience will survey the work area and a minimum 50-ft radius (of the work area) for burrows and crevices in which giant garter snake could be present. It is advised that all potentially suitable burrows and crevices be flagged and avoided by a minimum 50-ft no-disturbance buffer. If a 50-ft radius buffer isn't feasible, consultation with USFWS and CDFW is warranted to discuss how to implement the Project and avoid take.
- c) If a snake species of any kind is observed within the Project Area, all Project activities will halt, and work will not continue until the snake species is identified by a qualified biologist. If a giant garter snake is discovered at any time within the Project site and staging areas, then all Project activities will halt until USFWS and CDFW have been

- notified and the Project complies with ESA and CESA. CDFW may provide additional giant garter snake protection measures in the event of a giant garter snake detection.
- d) During Project dewatering, potential snake prey (e.g., fish and tadpoles) will be removed to the extent feasible so that snakes are not attracted to the construction footprint.
 - e) The Project will prohibit use of erosion control materials potentially harmful to giant garter snake, such as mono-filament netting; alternatively, tightly woven fiber netting or similar material will be used to ensure that giant garter snakes do not get trapped or become entangled.
 - f) All Project Areas will be surveyed and monitored for giant garter snakes by a qualified biologist during all dewatering and backfilling activities and again if there is a lapse in construction activity of two weeks or more.

MM-6. Prior to Project activities, a Fish Capture and Relocation Plan will be developed and submitted to the appropriate state and federal wildlife agencies (e.g., CDFW, USFWS, National Marine Fisheries Service [NMFS]) for review and approval. The plan will describe the proposed lead biologist's qualifications, capture methods, capture and relocation work areas, and reporting requirements, including details in the list below.

- a) This plan will incorporate the latest USFWS and NMFS guidance relating to the capture and relocation of fish, as applicable.
- b) To avoid the introduction or spread of aquatic invasive species, procedures for decontamination of any equipment used in the capture and relocation of fish will be identified.
- c) Prior to the implementation of capture and relocation activities, relocation (or release) sites will be identified by a qualified biologist, based on proximity, access, habitat suitability, and potential to be affected by construction-related disturbance. Suitable habitat for relocation sites will be in the same watershed/subwatershed basin where fish are originally captured. One or more of the following methods will be used to capture protected fish species: electrofishing, dip net, seine, throw net, minnow trap, and hand.
- d) Fish relocation will only be led by a qualified biologist. The qualified biologist will have knowledge and experience in fish biology and ecology (and the special-status species potentially encountered); fish/habitat relationships; biological monitoring; handling, collecting, and relocating fish; or other relevant experience.
- e) Residual surface water associated with the diverted or dewatered habitat will be monitored or sampled for the presence of fish by a qualified biologist as soon as the waters are isolated. If a listed species of fish is observed in the isolated habitat, they will be immediately captured and relocated to the suitable habitat outside of the construction area, but in the same water basin, by the qualified biologist, in accordance with the approved fish capture and relocation plan.
- f) The qualified biologist will relocate any stranded covered fish species to an appropriate place, depending on the life stage of the fish and consistent with the approved rescue and relocation plan.
- g) The qualified biologist will approximate the number of individuals observed in the affected area, the number of individuals relocated, the approximate size of individuals, the location of capture and release, any instances of injury or mortality, and the date and time of the collection and relocation. These data will be collected secondarily to the safe and efficient fish rescue and relocation effort, where the main goal is to prioritize the capture and release of fish. This information will be reported to the appropriate state and/or federal agencies within seven days of completion of the fish capture and relocation effort.

MM-7. The following actions will be implemented during sheet pile cofferdam installation and removal to avoid and minimize potential impacts to fish and aquatic wildlife:

- a) Cofferdam installation will occur during passive tidal outflow, allowing water to drain and fish and wildlife species to leave the area to be enclosed under their own volition, as feasible.
- b) Cofferdams will enclose the minimum area necessary to perform construction activities.
- c) If cofferdam installation requires pile driving, vibratory hammers or low/non-impact (i.e., hydraulic) methods will be used. If impact hammers are required, sound dampening or attenuation devices (e.g., cushioning blocks, air bubble curtains) will be utilized. Pile driving will follow criteria outlined in *Technical Guidance for Assessment and Mitigation of Hydroacoustic Effects of Pile Driving on Fish* (Caltrans 2015).
- d) Cofferdam footings will be installed to a depth appropriate for impeding the amount of subsurface flow necessary for dewatering the streambed.
- e) Fine-meshed block nets or screens with openings no wider than 1/8 inch will be utilized during cofferdam installation to ensure fish and aquatic wildlife do not enter areas to be dewatered. The bottom of the nets or screens will be secured to the channel bed, and the nets will be checked at least twice daily and cleaned of debris, as necessary, to permit free flow of water.
- f) Cofferdams will be removed at the lowest possible tide and in slack water to minimize disturbance. Alteration of the streambed will be minimized, and any imported material that is not part of the Project design will be removed.

MM-8. The following actions will be implemented during dewatering to avoid and minimize potential impacts to fish and aquatic wildlife:

- a) Dewatering equipment will be installed to maintain natural flow in waterways adjacent to (i.e., not enclosed by) cofferdams.
- b) Dewatering will occur for the minimum amount of time required to perform construction activities in the isolated areas.
- c) Dewatering pump intakes will be covered with 3/32-inch mesh and checked periodically to prevent potential entrainment of fish or other aquatic species (e.g., northwestern pond turtles).

MM-9. Construction work will take place outside the February 15 to September 15 bird nesting seasonal window to the maximum extent practicable. If construction is conducted during the nesting season, a biologist will conduct one focused pre-construction nesting bird survey throughout the Project Area no more than five days prior to the initiation of Project activities. The survey will be conducted in all potential habitat located in the Project Area and the minimum survey radii surrounding the Project Area. The minimum survey radii surrounding the work Project Area will be 250 ft for passerines and 1,000 ft for raptors such as *Buteo* spp. If there is a lapse in construction activities for seven days or more during the nesting season, a biologist will conduct an additional focused pre-construction nesting bird survey in areas of potential habitat again before Project activities can be reinitiated. If an active nest is found, a no-disturbance “Active Nest Buffer” will be established around the nest. The biologist may consult with CDFW, if needed, regarding appropriate action to comply with Fish and Game Code.

- a) Active Nest Buffers. Active nest sites and protective buffer zones will be designated as “ecologically sensitive areas” where no Project activities may occur or personnel may enter (while occupied or “active”) during the course of nesting bird season with the

establishment of a fence barrier or flagging surrounding the nest site, if needed. The qualified biologist will determine the necessary buffer, in consultation with CDFW if needed, to protect nesting birds based on existing site conditions, such as construction activity, topography, and line of sight, and will increase buffers as needed to provide sufficient protection of nesting birds and their natural behaviors.

- b) Active Nests. If work needs to be conducted within an active nest buffer, a qualified biologist will monitor the nest to detect any signs of disturbance and behavioral changes as a result of the Project. If signs of disturbance and behavioral changes are observed, the qualified biologist will halt Project activities causing that change until the nestlings have fledged, and the nest is determined to be inactive.

MM-10. Western burrowing owl (*Athene cunicularia hypugaea*) could occur in or near the work area. No more than 14 days prior to the start of construction, a biologist will conduct a pre-construction survey for active burrowing owl burrows using methods recommended by CDFW in the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012). Occupied habitat includes areas burrowing owls may use for breeding/nesting (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*) will be established by a biologist in consideration of surrounding waterways. Project-related activities necessary within the buffer will be monitored by a qualified biologist to ensure the owls are not detrimentally affected by Project construction. The on-site biologist will have the authority to stop work if the owls are exhibiting agitated behavior.

MM-11. Call-back/response surveys for California black rail will be performed by a qualified biologist using the most up-to-date methodologies in areas of suitable rail habitat within 700 ft of the Project Area. If an active breeding location is identified during surveys, a 700-ft no-disturbance buffer will be implemented for the duration of the rail breeding season. If work must occur within the no-disturbance buffer, a biological monitor will be on site for all activities and will stop work if the breeding rails are showing signs of distress (e.g., distress vocalizations, flying away from the nest location).

MM-12. A preconstruction survey for special-status bumble bees (*Bombus* spp.) and their nests will be conducted no more than 7 days in advance of construction activities within the Project Area. If an active bumble bee nest is identified, a 25 ft no-disturbance buffer will be established and will remain in place until the biologist is able to determine the nest is no longer active.

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 will be implemented to ensure potential impacts are reduced to less than significant levels.

Table 2-1. Summary of 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?	☐	☐	✓	☐
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, such as of a scenic view, open space, or architectural facade. The aesthetic value of an area is a measure of its visual character and visual quality combined with viewer response (FHWA 1983). This combination may be affected by the components of a project (e.g., buildings constructed at heights that obstruct views, hillsides cut and graded, open space changed to an urban setting) or by the length or frequency of viewer exposure to a setting. Aesthetic impacts are changes in viewer response because of Project construction and operation.

The levees along the perimeter of Hastings Tract provide scenic views of the Delta, including Cache Slough and Lindsey Slough. Views of the tract interior are largely agricultural and include ruderal vegetation, managed agricultural fields, and small patches of Riparian Forest and Scrub-shrub habitat. Viewers include recreational visitors to Hastings Island Hunting Preserve, the few residents of the tract, District employees who maintain the tract’s infrastructure, and farmers who manage the tract’s agricultural fields. People boating in waterways surrounding the tract are not generally able to see the tract’s interior because of the existing levees.

2.1.2 Findings

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

Project implementation will not alter the scenic views of Cache Slough or Lindsey Slough from Hastings Tract. Views of the tract interior are not scenic, as described above, and will not change following Project construction. There will be no impact.

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

No state scenic highways pass through the Project Area, nor is the Project Area visible from any state scenic highways. There will be no impact.

c) In nonurbanized areas, would the Project substantially degrade the existing visual character or quality of public views of the site and its surroundings?

Construction activities will temporarily disrupt the visual character of the Project Area. During Project construction, vegetation within the construction footprint will be removed and portions of the Cache Slough and Lindsey Slough levees will be excavated, which will temporarily degrade the visual quality of the site. Construction equipment may be visible to boaters using the adjacent waterways or the limited number of visitors to or residents of the tract. These impacts will occur for a short period of time (i.e., approximately three months). After Project completion, construction equipment will be removed, and the levee slopes or other disturbed areas will be revegetated with a native seed mix. The Project will therefore not substantially permanently degrade the visual character or aesthetic quality of the Project Area or surrounding areas, and impacts will 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?

There will be no nighttime construction or creation of a new source of substantial light or glare because of the Project. There will be no impact.

2.2 Agriculture and Forestry Resources

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
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

The Project's location in the Sacramento Valley near Cache and Lindsey sloughs has allowed for the development of deep, rich agricultural soil over time. This rich soil and a climate with a lengthy growing season promote extensive agricultural production in Solano County. The county contains approximately 360,000 acres of land in agricultural production, most of which are in active production for fruit and nut crops, vegetable crops, or livestock (Solano County 2008). Much of the approximately 6,400 acres on the interior of Hastings Tract is in agricultural production for field or vegetable crops.

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 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 2023a).

The majority of Hastings Tract is designated as Prime Farmland or Farmland of Statewide Importance (California DOC 2022). The Project Area includes 1.7 acres of land designated as

Prime Farmland, 0.4 acre of Unique Farmland, and 0.2 acre of Grazing Land. Of the 1.7 acres of Prime Farmland in the Project Area, 0.3 acre is in the staging area near Lindsey Slough.

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?

The Project Area includes 1.7 acres of land designated as Prime Farmland, 0.4 acre of Unique Farmland, and 0.2 acre of Grazing Land. Although much of the construction footprint is classified as Farmland by the FMMP, this area is primarily composed of levees that protect the adjacent agricultural fields. The levees are not in agricultural production and will be restored to their current use following Project construction. The staging area near Lindsey Slough, which includes 0.3 acre of Prime Farmland regularly used for production of field crops, will be temporarily unavailable for agricultural use during Project construction but will remain available for agricultural use over the long term. The impact will be less than significant.

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

The Project Area is currently zoned for agricultural use and included in a Williamson Act contract. However, the Project's construction footprint only includes the Cache Slough, Lindsey Slough, and Hastings Cut levees and portions of the adjacent waterways, and is not used for agricultural production. The Project's 0.65-acre staging area near Lindsey Slough is regularly cultivated with field crops but is separated from the large agricultural parcels on the interior of the tract by an irrigation ditch. Land use in the Project Area will not change following Project construction, and the footprint of the staging area will remain available for agricultural use. The impact of the Project will 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. There will be no impact.

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

The Project will not result in the loss of forest land or conversion of forest land to non-forest use. There will be no impact.

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?

Land use in the Project Area and vicinity will not change following Project construction; therefore, the Project will not involve other changes in the existing environment which could result in conversion of Farmland to non-agricultural use. There will be no impact.

2.3 Air Quality

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
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 Project is in the Sacramento Valley Air Basin (SVAB), which includes Butte, Colusa, Glenn, Placer (western), Sacramento, Shasta, Solano (eastern), Sutter, Tehama, Yolo, and Yuba counties, and is administered by the Yolo-Solano Air Quality Management District (YSAQMD). The SVAB is bounded by mountainous areas to the east, west, and north, with an opening to the south into the Delta. 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 CARB have established air quality standards for several common pollutants: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, sulfur dioxide, sulfates, and hydrogen sulfide (CARB 2023a). Air quality data for some criteria air pollutants in the SVAB are summarized for 2017 to 2021 in Table 2-2.

Table 2-2. Summary air quality statistics for the Sacramento Valley Air Basin, 2017 to 2021.

Year	Pollutant (averaging time)	Maximum concentration	No. of days exceeding federal standards	No. of days exceeding state standards
2017	Ozone (1-hour)	0.121 ppm	n/a	7
	Ozone (8-hour)	0.091 ppm	34	35
	PM _{2.5} (daily)	85.9 µg/m ³	12	n/a
	PM ₁₀ (daily)	237.7 µg/m ³	6	19
2018	Ozone (1-hour)	0.117 ppm	n/a	11
	Ozone (8-hour)	0.098 ppm	36	42
	PM _{2.5} (daily)	411.7 µg/m ³	24	n/a
	PM ₁₀ (daily)	454.0 µg/m ³	9	60
2019	Ozone (1-hour)	0.103 ppm	n/a	3
	Ozone (8-hour)	0.082 ppm	12	15
	PM _{2.5} (daily)	41.4 µg/m ³	3	n/a
	PM ₁₀ (daily)	174.7 µg/m ³	1	45
2020	Ozone (1-hour)	0.137 ppm	n/a	9
	Ozone (8-hour)	0.097 ppm	29	33
	PM _{2.5} (daily)	329.3 µg/m ³	34	n/a
	PM ₁₀ (daily)	391.3 µg/m ³	10	77
2021	Ozone (1-hour)	0.114 ppm	n/a	13
	Ozone (8-hour)	0.097 ppm	52	56
	PM _{2.5} (daily)	265.7 µg/m ³	26	n/a
	PM ₁₀ (daily)	218.2 µg/m ³	1	48

Source: CARB (2023b)

n/a = not applicable

PM_{2.5} = respirable particulate matter less than 2.5 microns in diameterPM₁₀ = respirable particulate matter less than 10 microns in diameter

ppm = parts per million

µg/m³ = micrograms per cubic meter of air

The SVAB does not consistently meet all applicable air quality standards (CARB 2023c). The portion of Solano County within the SVAB is currently designated as nonattainment for state ozone and PM₁₀¹ standards (CARB 2023c) and for federal ozone standards (USEPA 2023a). Otherwise, the Project Area is designated as attainment for carbon monoxide, lead, nitrogen dioxide, PM_{2.5},² and sulfur dioxide standards. Therefore, criteria air pollutants and precursors of primary concern for construction activity in the Project Area include ozone precursors (e.g., nitrogen oxides, reactive organic gases) and fugitive/exhaust dust particulate matter (PM₁₀).

YSAQMD has established an Air Quality Attainment Plan to aid in the attainment of federal and state ozone standards, largely through emissions reductions (YSAQMD 2019). In accordance with this plan and state and federal air quality standards, YSAQMD has developed emissions thresholds for criteria pollutants for which the Project region is designated as non-attainment to be used in determining the significance of Project-related air quality impacts (YSAQMD 2007). Since YSAQMD emissions thresholds are more stringent than U.S. Environmental Protection Agency (USEPA) thresholds, emissions would be considered significant if they exceeded the

¹ Respirable particulate matter less than 10 microns in diameter² Respirable particulate matter less than 2.5 microns in diameter

local thresholds. Thresholds established by YSAQMD are 10 tons per year of nitrogen oxides, 80 pounds per day of PM₁₀, and 10 tons per year of reactive organic gases..

In addition to thresholds for criteria pollutants, YSAQMD has adopted a threshold of significance for odors. A project is considered to have a significant adverse odor impact if it “generates odorous emissions in such quantities as to cause detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which may endanger the comfort, repose, health, or safety of any such person or the public, or which may cause, or have a natural tendency to cause, injury or damage to business or property.”

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 receptor to the Project Area is the rural residence on the opposite side of Cache Slough from the Project Area, approximately 650 ft away. Other rural residences in the vicinity are greater than 1 mile from the Project Area.

2.3.2 Findings

Project construction details (e.g., duration, timing, equipment use) were analyzed using the California Emissions Estimator Model Version 2022.1.1.14 (CalEEMod) to estimate 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 there will be no change in operations or maintenance activity following Project construction. The CalEEMod data entry and emissions summary sheet is included as Appendix A.

The modeling was based on the emission sources in Table 2-3 below and the construction equipment and phasing 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 on-site water truck, speed limits on unpaved roads).

Table 2-3. Project quantities used to determine Project emissions.

Emission source	Project quantities
Imported soil fill	1,667 cubic yards
Imported aggregate base	250 cubic yards
Imported rip rap	227 cubic yards
Employee commute trips	6 employee trips/day 20 miles one way

Model results for total anticipated Project emissions of criteria pollutants for which the Project region is designated as non-attainment are shown in Table 2-4 and included in detail in Appendix A.

Table 2-4. Total estimated Project construction emissions of criteria pollutants for which the Project region is designated as non-attainment.

	NO_x (tons/year)	PM₁₀ (lbs/day)	ROG (tons/year)
Maximum Project emissions	0.56	58.2	0.07
Emissions threshold	10	80	10

Notes:

lbs = pounds

NO_x = nitrogen oxidesPM₁₀ = respirable particulate matter (less than 10 microns in diameter)

ROG = reactive organic gases

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

Based on the air quality modeling, Project construction is expected to result in temporary emissions of ozone precursors (i.e., nitrogen oxides and reactive organic gases) that are below YSAQMD standards and therefore do not conflict with emissions reductions goals outlined in the applicable YSAQMD Air Quality Attainment Plan (YSAQMD 2019). Although the applicable air quality plan does not outline specific requirements for mobile emission sources used during Project construction (i.e., equipment, vehicles), the Project will implement BMPs as part of conservation measure **CM-1** (Section 1.4.5) to ensure emissions of ozone precursors are minimized. There will be no change in long-term operational emissions. The Project will therefore not conflict with or obstruct implementation of an applicable air quality plan; there will be no impact.

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 model results summarized in Table 2-4 demonstrate that Project construction emissions are not expected to exceed thresholds for criteria air pollutants for which the SVAB is currently designated as nonattainment (including PM₁₀ and ozone precursors [i.e., nitrogen oxides, reactive organic gases]), and implementation of BMPs in **CM-1** (Section 1.4.5) will ensure emissions are minimized. There will be no change in long-term operational emissions because of the Project. Although Project construction will result in some emissions for which the SVAB is not in attainment, the minimal amount and temporary nature of these emissions will not result in a cumulatively considerable net increase of these pollutants. Therefore, the impact will be less than significant.

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

The nearest sensitive receptor to the Project Area is the rural residence on the opposite side of Cache Slough from the Project Area, approximately 650 ft away. Other rural residences in the vicinity are greater than 1 mile from the Project Area.

The Project will not result in substantial diesel particulate emissions. Maximum exhaust emissions are 1.21 pounds per day PM₁₀ and 1.11 pounds per day PM_{2.5}, and average exhaust emissions are 0.14 pounds per day PM₁₀ and 0.12 pounds per day PM_{2.5} (Appendix A). Implementation of BMPs included in **CM-1** (Section 1.4.5) will minimize diesel emissions, and

Project construction will be temporary, resulting in increased diesel exhaust for approximately 66 days. Therefore, the Project's impact on exposing sensitive receptors to substantial pollutant concentrations will 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, adversely affecting a substantial number of people. Post-construction, the Project will not result in any change to current operation or maintenance activities that would result in additional emissions. The Project will 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 identify sensitive biological resources or available habitat within or near the Project Area. These evaluations included land cover classification and vegetation mapping, surveys for special-status plants, habitat assessments for special-status fish and wildlife species, and a delineation of potentially jurisdictional waters/wetlands. Results from these evaluations were used to inform impact analyses and the development of appropriate conservation measures.

2.4.1.1 Special-status species

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

- CDFW's California Natural Diversity Database (CNDDDB; CDFW 2023a) for the United States Geological Survey (USGS) 7.5-minute quadrangle in which the Project Area is located (Dozier) and the surrounding eight quadrangles (i.e., Allendale, Birds Landing, Denverton, Dixon, Elmira, Liberty Island, Rio Vista, and Saxon),
- USFWS's Information for Planning and Conservation (IPaC) portal (USFWS 2023a),
- National Marine Fisheries Service's (NMFS's) West Coast Region, California Species List Tool (NMFS 2016), and
- California Native Plant Society's online Inventory of Rare and Endangered Vascular Plants of California (CNPS 2023a).

Database query results are presented in Appendix B (for special-status plants) and Appendix C (for 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 in the Project Area, resulting in a refined list of species that may be impacted by the Project. 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.

Plants

Stillwater Sciences biologists (E. Applequist and C. Bilodeau) conducted special-status plant surveys on April 21 and June 5, 2023. Botanical surveys for special-status plants were comprehensive, conducted during appropriate bloom periods, and followed accepted protocols (USFWS 2000, CDFW 2018).

Three special-status plant species (Delta tule pea [*Lathyrus jepsonii*], Mason's lilaeopsis [*Lilaeopsis masonii*], and Suisun Marsh aster [*Symphotrichum lentum*]) were documented in and adjacent to the Project Area during 2023 botanical surveys (Table 2-5, Figure 2-1). An additional special-status plant species, Parry's rough tarplant (*Centromadia parryi* subsp. *rudis*), was observed outside of the Project Area along the haul route. A comprehensive list of all plants documented in the Project Area during the botanical surveys is included in Appendix D.

Table 2-5. Special-status plant populations documented in or near the Project Area.

Scientific name	Common name	Status ¹ Federal/State/ CRPR	Patch ID	Number of individuals or net patch area	
				Total patch	In Project Area
<i>Centromadia parryi</i> subsp. <i>rudis</i>	Parry’s rough tarplant	–/–/4.2	CEPA01	170	--
<i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	Delta tule pea	–/–/1B.2	LAJE01	20	20
			LAJE02	10	--
			LAJE03	10	--
			LAJE04	25	25
Total				65	45
<i>Lilaeopsis masonii</i>	Mason’s lilaeopsis	–/CR/1B.1	LIMA01	0.3 ft²	0.3 ft²
			LIMA02	6.4 ft²	0.5 ft²
Total				6.7 ft²	0.8 ft²
<i>Symphyotrichum lentum</i>	Suisun Marsh aster	–/–/1B.2	SYLE01	40	20
			SYLE02	10	--
Total				50	20

ft² = square feet¹ Status:**State List**

CR State Listed as Rare

California Rare Plant Rank (CRPR):

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

4 Plants of limited distribution, a watch list

CRPR Threat Rank:

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

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



Figure 2-1a. Special-status plants in the Project Area, northern portion along Cache Slough (page 1 of 2).

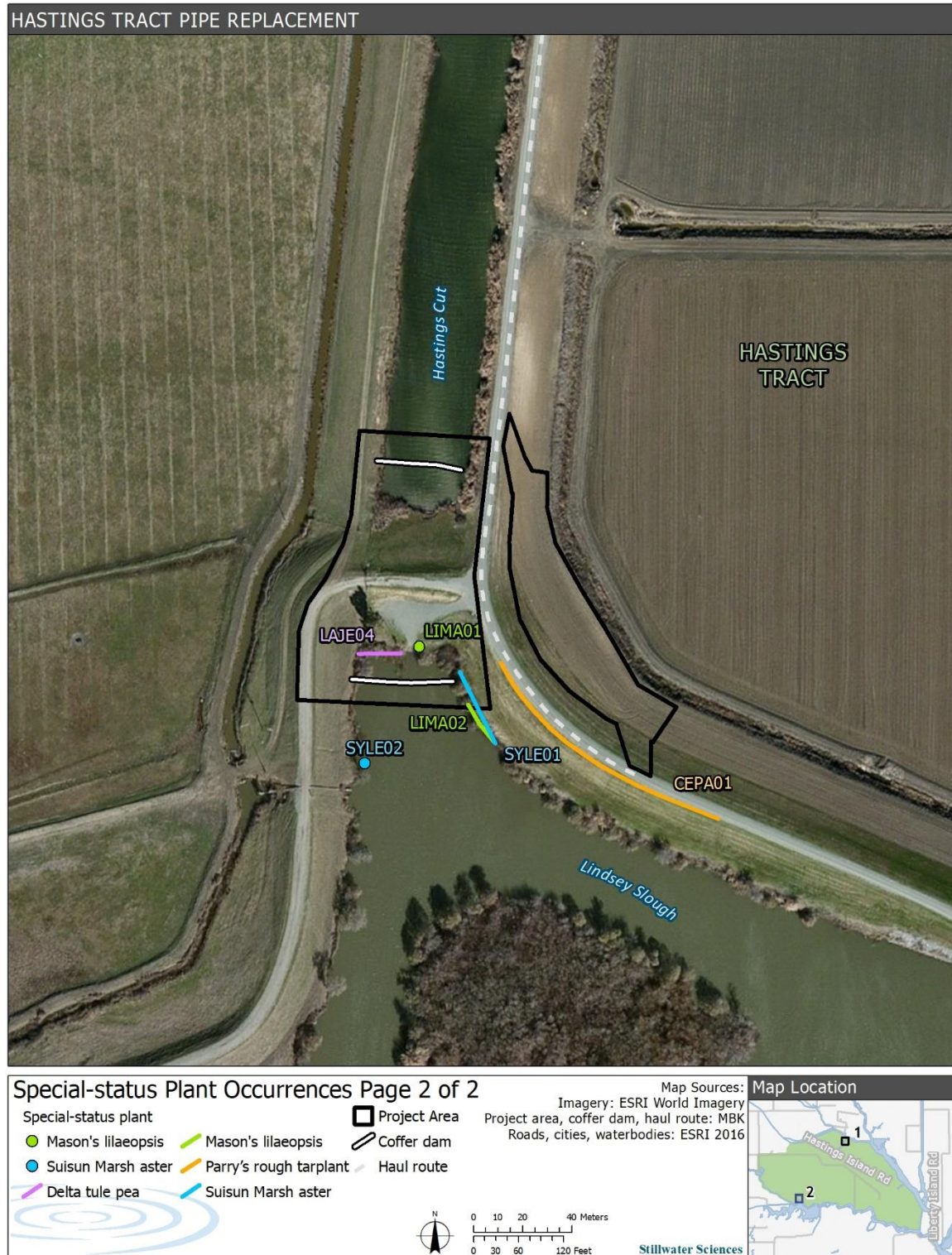


Figure 2-1b. Special-status plants in the Project Area, southern portion along Lindsey Slough (page 2 of 2).

Parry's rough tarplant

A population of 170 Parry's rough tarplant individuals was documented outside of the Project Area, growing adjacent to the haul route near Lindsey Slough (Table 2-5, Figure 2-1).

Parry's rough tarplant is an annual herb in the Asteraceae family and is endemic to California. It has a California Rare Plant Rank (CRPR) of 4.2. It grows in alkaline areas of vernal pools and seeps and vernal mesic areas of valley and foothill grasslands and roadsides. It occurs at elevations of 0 to 330 ft and blooms from May to October. Populations are threatened by development, habitat alteration, habitat disturbance, grazing, and roadside maintenance (CNPS 2023a).

Delta tule pea

Two patches of Delta tule pea were documented in the Project Area, growing above the mean high water line (i.e., 6.1 ft North American vertical datum 1988) along the waterside toe of the Lindsey Slough levee and the northeastern end of Hastings Cut (Figure 2-1). A total of 45 Delta tule pea plants were documented in the Project Area in these two patches (Table 2-5). Another two patches were documented along Cache Slough and Hastings Cut adjacent to the northern portion of the Project Area. These patches are part of the previously documented occurrences #52 and #53 and (CDFW 2023a).

Delta tule pea is a perennial herb in the Fabaceae family and is endemic to California. It has a CRPR of 1B.2. It grows in brackish and freshwater marshes and swamps at elevations from 0 to 16 ft and blooms from May to July (sometimes to August and September). Most populations are small and are threatened by agriculture, water diversions, and erosion (CNPS 2023a).

***Mason's lilaeopsis***

The population of Mason's lilaeopsis documented in the Project Area was found in two discrete patches growing in the intertidal zone below the mean high water line along the Lindsey Slough levee (Figure 2-1). The combined net patch size was 6.7 square feet, with a total of 0.8 square feet in the Project Area (Table 2-5). This population is part of the previously documented occurrence #70 (CDFW 2023a).



Mason's lilaeopsis is a perennial rhizomatous herb in the Apiaceae family and is endemic to California. It is state listed as Rare and has a CRPR of 1B.1. It occurs in freshwater and brackish marshes and swamps and riparian scrub at elevations ranging from 0 to 32 ft and blooms from April to November (CNPS 2023a). It is threatened by erosion, channel stabilization, development, flood control projects, recreation, agriculture, shading resulting from marsh succession, and competition with non-native water hyacinth (*Eichhornia crassipes*) (CNPS 2023a). Many populations are ephemeral, occupying newly deposited or exposed sediments (CNPS 2023a).

Suisun Marsh aster

The Suisun Marsh aster population documented along the waterside toe of the Lindsey Slough levee at or just above mean higher high water was found across two discrete patches, one of which included 20 plants in the Project Area (Table 2-5, Figure 2-1). This population is part of the previously documented occurrence #28 (CDFW 2023a).

Suisun Marsh aster is a perennial rhizomatous herb in the sunflower (Asteraceae) family that has a CRPR of 1B.2. It is endemic to California, occurring below 10 ft in elevation within the southern Sacramento Valley, the Delta, and eastern San Francisco Bay in Contra Costa, Napa, Sacramento, San Joaquin, Solano, and Yolo counties (CNPS 2023a). Suisun Marsh aster typically occurs in brackish and freshwater marshes and swamps and blooms from May (sometimes as early as April) to November (CNPS 2023a). This species is threatened by habitat alteration and loss as well as erosion, and possibly threatened by herbicide application and competition from non-native plants (CNPS 2023a).

**Fish**

Database queries identified eight special-status fish species that have the potential to occur in the Project region (Appendix C). Of these, seven have a moderate potential to occur within the Project Area (Table 2-6) during specific times of year (Table 2-7). The single remaining species has no potential to occur in or near the Project Area because the Project Area is outside of the species' known range.

Table 2-6. Special-status fish with moderate or greater potential to occur in the Project Area.

Common name Scientific name	Status ¹ Federal/ State	Likelihood to occur in the Project Area
Fishes		
North American green sturgeon: southern DPS <i>Acipenser medirostris</i>	FT/–	Moderate. The Project Area likely contains suitable rearing and migration habitat for juveniles and adults in Lindsey Slough but lacks suitable spawning habitat. 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 (70 FR 17386). Critical habitat for this species is present in the Project Area (NMFS 2009).
Sacramento splittail <i>Pogonichthys macrolepidotus</i>	–/SSC	Moderate. The larger Cache-Lindsey Complex contains suitable habitat. Non-reproductive adult splittail are most abundant in moderately shallow, brackish tidal sloughs but can also be found in freshwater areas with tidal or riverine flow (Moyle et al. 2004). Young-of-the-year and yearling splittail are generally most abundant in shallow water (Moyle 2002). Individuals have been periodically caught in Cache Slough near the confluence with Lindsey Slough (at 20-mm Survey Station 716) within 5 miles of the Project Area (CDFW 2023a) and in Lindsey Slough in 2014 (Young et al. 2015).

Common name Scientific name	Status ¹ Federal/ State	Likelihood to occur in the Project Area
Delta smelt <i>Hypomesus transpacificus</i>	FT/SE	Moderate. Spawning may occur within the Project Area in Cache Slough or Lindsey Slough (inferred from larval catches) (Moyle 2002, Bennett 2005). Cache Slough is considered key habitat for the species (Merz et al. 2011). 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). Juvenile delta smelt were captured upstream of the Project Area in Barker Slough (at 20-mm Survey Station 720) in 2019, and larvae have been found in the Barker-Lindsey slough complex (Bennett 2005). Critical habitat for delta smelt is present in the Project Area (USFWS 2004).
Longfin smelt, San Francisco Bay-Delta DPS <i>Spirinchus thaleichthys</i>	FPE/ST	Moderate. Although longfin smelt populations in the San Francisco Bay-Delta are concentrated in Suisun, San Pablo, and North San Francisco bays, they also infrequently occur upstream of Rio Vista or Medford Island in the Delta (Moyle 2002). Individuals were captured several times in Barker Slough and Lindsey Slough (at 20-mm Survey Stations 720 and 718, respectively) between 2008 and 2014 (CDFW 2023a,b).
Chinook salmon, Central Valley spring-run ESU <i>Oncorhynchus tshawytscha</i>	FT/ST	Moderate. Juvenile Central Valley spring-run ESU Chinook salmon have some potential to occur within the Project Area. Lindsey and Cache sloughs do not constitute a typical migratory pathway for adults or juveniles but may provide non-natal rearing habitat. Juvenile Chinook salmon have been caught in Lindsey Slough at very low densities (CDFW 2023a, Young et al. 2015) but it is not possible to assign these individuals to a particular ESU. Critical habitat for the Central Valley spring-run ESU is present within the Project Area.
Chinook salmon, Sacramento River winter-run ESU <i>Oncorhynchus tshawytscha</i>	FE/SE	Moderate. Juvenile Sacramento River winter-run ESU Chinook salmon have some potential to occur within the Project Area. Lindsey and Cache sloughs do not constitute a typical migratory pathway for adults or juveniles but may provide non-natal rearing habitat. Juvenile Chinook salmon have been caught in Lindsey Slough at very low densities (CDFW 2023a, Young et al. 2015) but it is not possible to assign these individuals to a particular ESU. Critical habitat for the Sacramento River winter-run ESU is not present within the Project Area.
Steelhead, Central Valley DPS <i>Oncorhynchus mykiss irideus</i>	FT/–	Moderate. Juvenile CCV steelhead may use the Project Area on a seasonal basis as they migrate and rear throughout the Delta. Lindsey and Cache sloughs do not constitute typical migratory pathways for adult steelhead but may provide suitable non natal rearing habitat for juveniles. Critical habitat for the Central Valley DPS is present within the Project Area.

Notes: DPS = Distinct Population Segment; ESU = Evolutionarily Significant Unit; mm = millimeter

¹ Status

Federal

FT = listed as threatened under the federal Endangered

Species Act

FPE = proposed as endangered under the federal Endangered

Species Act

FE = listed as endangered under the federal Endangered

Species Act

State

SE = listed as endangered under the California

Endangered Species Act (CESA)

ST = listed as threatened under the CESA

SSC = CDFW Species of Special Concern

Table 2-7. Timing of special-status fish species life stages¹ in the vicinity of the Project Area (bracketed heavy lines indicate the proposed in-water work period of August 1 through November 30).

Species ESU/DPS	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
North American green sturgeon, southern DPS												
Adult migration												
Juvenile												
Rearing/migration												
Sacramento splittail												
Adult migration												
Juvenile												
rearing/migration												
Delta smelt												
Adult migration												
Spawning												
Larval development/ juvenile rearing												
Longfin smelt, San Francisco Bay-Delta DPS												
Spawning												
Larval development/ juvenile rearing												
Chinook salmon, Central Valley spring-run ESU												
Adult migration												
Juvenile												
rearing/migration												
Chinook salmon, Sacramento River winter-run ESU												
Adult migration												
Juvenile												
rearing/migration												
Steelhead, Central Valley DPS												
Adult migration												
Juvenile												
rearing/migration												

¹ Spawning by North American green sturgeon, Sacramento splittail, longfin smelt, Chinook salmon, and steelhead does not occur within the Project Area.

Wildlife

Database queries identified 36 special-status wildlife species that have the potential to occur in the Project region (Appendix C). A Stillwater Sciences wildlife biologist (M. Montjoy) conducted a wildlife habitat assessment on June 5, 2023, to determine the likelihood for these species to occur in the Project Area. A follow-up focused habitat assessment for California tiger salamander and giant garter snake (e.g., identifying potential upland habitat, available burrows, and assessing nearby aquatic habitat) was conducted on April 30, 2024, by M. Montjoy (wildlife biologist) and H. Burger (wildlife biologist). Based on these habitat assessments, fifteen species identified by queries required additional analysis for Project-related impacts (Table 2-8). These species either have a moderate or high potential to occur within the Project Area, there is potential breeding habitat near the Project Area, and/or the species' status warrants additional consideration while there was a low potential to occur. The remaining 21 species have no or low potential to occur in or near the Project Area due to a lack of suitable habitat or because the Project Area is outside of the species' known range (Appendix C); these species are not analyzed further.

Table 2-8. Special-status wildlife included for analysis for Project-related impacts.

Common name Scientific name	Status ¹ Federal/State	Likelihood to occur in the Project Area
Amphibians		
California tiger salamander, central California DPS <i>Ambystoma californiense</i>	FT/ST	Low. The Project Area does not contain suitable upland habitat, as no burrows, large deep cracks, or evidence of burrowing mammals were observed there during the habitat assessments. The nearest documented occurrences, from 2014, are near the intersection of Hastings Island Road and Salem and Rio Dixon roads (CDFW 2023a), approximately 2 miles northwest of the Lindsey Slough portion of the Project Area. This species has been included in analysis based on the proximity of potential but unconfirmed aquatic breeding habitat (in pasture lands outside of the Project Area), and the species' listing status. There is no critical habitat for this species in the Project Area (USFWS 2005).
Reptiles		
Northwestern pond turtle <i>Actinemys marmorata</i>	FPT/SSC	Moderate. The Project Area contains suitable aquatic habitat in Hastings Cut and Lindsey and Cache sloughs and the uplands may be used as dispersal between these suitable aquatic habitats. The uplands in the Project Area are routinely managed, travelled, or disturbed making them less likely to be used as nesting sites. Two western pond turtles were observed in an agricultural ditch to the north of the Cache Slough Project Area during the April 2024 habitat assessment. Additionally, a northwestern pond turtle was observed in Barker Slough, less than 1 mile upstream of the Project Area in 2020 (iNaturalist 2023).
Giant garter snake <i>Thamnophis gigas</i>	FT/ST	Moderate. The Project Area is within the species' range and contains suitable aquatic habitat. However, there were no burrows observed in the Project Area and the subterranean refugia was limited to shallow cracks in the ground, less likely to be used by the species. There is a documented occurrence of the species from 2017 in Shag Slough, less than 5 miles from the Project Area (CDFW 2023a). Additionally, there were three snakes observed in 2022 in Shag Slough and one in Duck Slough, all within 5 miles of the Project Area (CDFW 2023b).
Birds		
American white pelican <i>Pelecanus erythrorhynchos</i>	–/SSC	Moderate (foraging or roosting only). The Project Area is not within the nesting range of the species and does not contain suitable nesting habitat. However, wintering individuals may forage or roost in Lindsey Slough near the Project Area. Individuals have been observed flying above Hastings Tract numerous times between 2000 and 2023 (eBird 2023).
White-tailed kite <i>Elanus leucurus</i>	–/SFP	Moderate. Suitable foraging and nesting habitat is present around the Project Area.

Common name Scientific name	Status ¹ Federal/State	Likelihood to occur in the Project Area
Northern harrier <i>Circus hudsonius</i>	–/SSC	High. The Project Area contains suitable foraging habitat for the species. An intact tidal wetland, directly across Lindsey Slough from the Project Area, contains suitable nesting and foraging habitat. Individuals were observed on Hastings Tract adjacent to the Project Area during the 2023 and 2024 biological habitat assessments and the 2023 botanical surveys.
Swainson's hawk <i>Buteo swainsoni</i>	–/ST	High. There is suitable foraging habitat in alfalfa fields near the Project Area but the Project Area itself contains lower-quality foraging habitat as the tall, ruderal vegetation provides limited prey accessibility. While no nesting activity was observed in the Project Area, the few trees in the Project Area could provide nesting habitat. Nesting has been documented in 2007 and 2009 approximately 0.25 mile from the Project Area on the opposite bank of Lindsey Slough (CDFW 2023a). Individuals were observed on Hastings Tract adjacent to the Project Area in 2023 and in 2024 during the biological habitat assessments and during the 2023 botanical surveys.
California black rail <i>Laterallus jamaicensis coturniculus</i>	–/ST, SFP	Low. The Project Area contains only a small amount of intact tidal marsh, not constituting high quality nesting habitat, and no occurrences have been documented on Hastings Tract (CDFW 2023a). Several occurrences have been documented in tidal marshes across Lindsey Slough, between 0.5–1.0 mile from the Project Area, as recently as 2015 (CDFW 2023b). The species has been included in analysis based on proximity of suitable breeding habitat outside of the Project Area and the species' listing status.
Mountain plover <i>Charadrius montanus</i>	–/SSC	Moderate (non-nesting only). The staging area near Lindsey Slough and fields adjacent to the Project Area contain suitable non-breeding habitat. Additionally, the species was documented within 5 miles of the Project Area several times between 1999 and 2022 (CDFW 2023a, eBird 2023)
Western burrowing owl <i>Athene cunicularia hypugaea</i>	–/SSC	Moderate. Areas adjacent to access roads contain grassland habitats that are suitable for nesting (if suitable burrows are present) and foraging. Additionally, the species has been documented less than 0.25 mile north of the Project Area in 1977 and 2021 (CDFW 2023a, eBird 2023).
Short-eared owl <i>Asio flammeus</i>	–/SSC	Moderate (non-nesting only). The Project Area contains suitable foraging habitat. Individuals were observed near Hastings Road in 2019, approximately 2.5 miles from the Project Area (eBird 2023), but the species is not expected to nest within the Project Area.
Loggerhead shrike <i>Lanius ludovicianus</i>	–/SSC	Moderate. The Project Area contains suitable nesting and foraging habitat. Individuals were observed on the nearby Peterson Ranch and near Hastings Road in 2019, approximately 2.5 miles from the Project Area (eBird 2023).
Song sparrow ("Modesto" population) <i>Melospiza melodia</i>	–/SSC	Moderate. The Project Area and vicinity contain a moderate amount of suitable habitat for foraging and nesting. Individuals have been observed approximately 6 miles from the Project Area in 2009 (CDFW 2023a).

Common name Scientific name	Status ¹ Federal/State	Likelihood to occur in the Project Area
Tricolored blackbird <i>Agelaius tricolor</i>	–/ST	Moderate. Although there is limited nesting habitat in the Project Area, the species is abundant in the Project vicinity with several nearby occurrences (CDFW 2023a, eBird 2020) and may inhabit riparian scrub, agricultural fields, and/or grasslands within or adjacent to the Project Area.
Yellow-headed blackbird <i>Xanthocephalus xanthocephalus</i>	–/SSC	Moderate. The Project Area is adjacent to suitable foraging and nesting habitat. The species has been documented in similar habitat within 5 miles of the Project Area as recently as 2018 (eBird 2023).

Note: DPS = Distinct Population Segment

¹ Status

Federal

FT = Listed as threatened under the federal Endangered Species Act

FPT = Federally proposed as threatened

State

ST = Listed as Threatened under the California Endangered Species Act

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 in and near the Project Area. There are suitable trees, riparian corridors, and emergent vegetation present within the Project Area along Lindsey and Cache sloughs that could provide nesting habitat for a variety of bird species. Additionally, the ruderal vegetation present in the Project Area could be used by ground-nesting bird species. The nesting season for migratory birds is generally February 1 through August 15. Protection of migratory birds, including their active nests (i.e., containing eggs or young), is required by CDFG Code Sections 3503, 3513, and 3800.

2.4.1.2 Habitat types

Stillwater biologists (E. Applequist and C. Bilodeau) mapped the vegetated and non-vegetated habitats in the Project Area on April 21, 2023. Vegetation types were assessed to the extent necessary to determine where there was suitable habitat for special-status wildlife 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 CNDDDB as described in Section 2.4.1.1 (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 (2017) guidelines for assessing habitat for the federally listed valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) were also conducted during vegetation mapping.

Land cover within the construction footprint is largely composed of non-native ruderal herbaceous vegetation with patches of Freshwater Marsh, Riparian Forest, and Scrub-shrub adjacent to the waterways (i.e., Cache Slough, Lindsey Slough, and Hastings Cut). Native Freshwater Marsh, Riparian Forest, and Scrub-shrub stands in the Project Area provide high habitat value for native fish and wildlife species. Three sensitive natural communities—Oregon ash groves (*Fraxinus latifolia* forest and woodland alliance), valley oak riparian forest and woodland (*Quercus lobata* riparian forest and woodland alliance), and California rose briar patches (*Rosa californica* shrubland alliance)—are present within the Project Area and are highlighted individually within the mapped Riparian Forest and Scrub-shrub habitats, as

appropriate (CDFW 2023c). Himalayan blackberry (*Rubus armeniacus*) patches were mapped separately from other Scrub-shrub habitat because, although Himalayan blackberry provides foraging opportunities and refugia for some wildlife, it is an invasive, non-native species that often outcompetes native vegetation. No blue elderberry plants were documented in the Project Area. Habitat types in the Project Area are summarized in Table 2-9 and depicted in Figure 2-2.

Table 2-9. Habitat types in the Project Area.

Habitat type		Sensitive natural community? ¹	Acres	Percent of Project Area
Agriculture		no	0.73	19.1
Freshwater Marsh		no	0.07	1.7
Riparian Forest	Oregon ash	yes, S3.2	0.02	0.4
	Valley oak	yes, S3	0.05	1.2
	Other	no	0.08	2.2
	<i>Subtotal</i>		<i>0.15</i>	<i>3.9</i>
Road		no	0.55	14.3
Ruderal herbaceous vegetation		no	1.67	43.1
Scrub-shrub	California rose	yes, S3	0.01	0.2
	Other native	no	0.18	4.6
	Himalayan blackberry	no	0.01	0.2
	<i>Subtotal</i>		<i>0.19</i>	<i>5.0</i>
Water		no	0.51	13.1
Total			3.87	100.0

¹ Sensitive natural community rankings (CNPS 2023b)

S3 = vulnerable

0.2 = moderately threatened



Figure 2-2a. Habitat types in the Project Area, northern portion along Cache Slough (page 1 of 2).



Figure 2-2b. Habitat types in the Project Area, southern portion along Lindsey Slough (page 2 of 2).

Agriculture

The staging area near Lindsey Slough is regularly used for agricultural production of field crops (e.g., alfalfa [*Medicago sativa*], safflower [*Carthamus tinctorius*]) (Figure 2-2b). This area was not in active cultivation during 2023 botanical surveys but had been recently tilled and was sparsely vegetated with non-native herbaceous species (including escaped crops) such as alfalfa, common groundsel (*Senecio vulgaris*), and henbit (*Lamium amplexicaule*). Depending on crop type, agricultural fields may provide some form of habitat for native birds (e.g., foraging for raptors). A total of 0.73 acre (19.1%) of the Project Area is agriculture (Table 2-9).

Freshwater Marsh

A small patch of Freshwater Marsh including native common tule and non-native paleyellow iris (*Iris pseudacorus*; California Invasive Plant Council [Cal-IPC] Limited rating³) is present along the waterside toe of the Lindsey Slough levee, and a narrow band of Freshwater Marsh dominated by non-native giant reed (*Arundo donax*; Cal-IPC High rating) borders the southeastern end of Hastings Cut (Figure 2-2b). Freshwater Marsh habitat can provide nesting, foraging, roosting, and cover for a variety of native wildlife species. A total of 0.07 acre (1.7%) of the Project Area is Freshwater Marsh (Table 2-9).

Riparian Forest

Riparian Forest habitat in the Project Area is dominated by native tree species with an open to moderate canopy in the riparian corridors along Lindsey Slough and Hastings Cut (Figure 2-2). Two sensitive natural communities are mapped within the Riparian Forest habitat type in the Project Area: Oregon ash groves (0.02 acre) and valley oak riparian forest and woodland (0.05 acre) (Table 2-9). Oregon ash (*Fraxinus latifolia*) is the dominant plant species in the Oregon ash groves, and valley oak (*Quercus lobata*) is the dominant plant species in the valley oak riparian forest and woodland type. In other areas, the Riparian Forest habitat type is dominated by white alder (*Alnus rhombifolia*) or red gum (*Eucalyptus camaldulensis*). Native woody species in the understory include California rose (*Rosa californica*) and narrowleaf willow (*Salix exigua*). Herbaceous cover in the understory is moderate and includes the non-native species riggut grass (*Bromus diandrus*) and bull mallow (*Malva nicaeensis*).

Mature trees in Riparian Forest habitat may provide cover, roosting, foraging, and nesting habitat for raptors, songbirds, and other migratory birds. Where Riparian Forest vegetation overhangs water surfaces in the Project Area, it is classified as SRA habitat because it shades the water column, provides cover and foraging habitat for numerous fish species, and supports the aquatic ecosystem food web. A total of 0.15 acre (3.9%) of the Project Area is Riparian Forest (Table 2-9).

Road

A gravel road traverses the levee crowns throughout the Project Area and provides access to Lindsey Slough and the northeastern end of Hastings Cut (Figure 2-2). Roads cover a total of 0.55 acre (14.3%) of the Project Area (Table 2-9).

³ Cal-IPC categorizes non-native invasive plants based on an assessment of potential ecological impacts. Species rated “High” have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure; species rated “Moderate” have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure; and species rated “Limited” are invasive but have minor ecological impacts on a statewide level or not enough available information to justify a higher score (Cal-IPC 2023).

Ruderal Herbaceous vegetation

The ruderal herbaceous cover type is dominated by non-native herbaceous forb and grass species and is often found in disturbed sites. In the Project Area, ruderal herbaceous vegetation is found on the levee crowns and most of the levee slopes (Figure 2-2). Many species found within this habitat type in the Project Area are rated by Cal-IPC as Limited, Moderate, or High. Dominant plant species include the non-native grasses ripgut grass (Cal-IPC Moderate) and wild oat (*Avena fatua*; Cal-IPC Moderate). Non-native forbs present in this habitat type include bur-chervil (*Anthriscus caucalis*), black mustard (*Brassica nigra*; Cal-IPC Moderate), poison hemlock (*Conium maculatum*; Cal-IPC Moderate), and bristly oxtongue (*Helminthotheca echioides*; Cal-IPC Limited) (Cal-IPC 2023). Ruderal herbaceous areas generally do not provide high-quality wildlife habitat—particularly for special-status species—but may be utilized by some wildlife species for foraging or nesting. A total of 1.67 acres (43.1%) of the Project Area is ruderal herbaceous vegetation (Table 2-9).

Scrub-shrub

Scrub-shrub habitat is dominated by woody species and is often found in mesic soils along riparian corridors. In the Project Area, native Scrub-shrub vegetation is patchily distributed along the waterside toes of the Cache Slough and Lindsey Slough levees. A small patch of one sensitive natural community, California rose briar patches (0.01 acre), is included in the Scrub-shrub habitat type (Table 2-9, Figure 2-2). Within the California rose briar patches, California rose (*Rosa californica*) is the dominant species with a low cover of the native species Mexican rush (*Juncus mexicanus*) in the herbaceous understory. A patch of Scrub-shrub habitat along the northeastern end of Hastings Cut is dominated by a dense thicket of Himalayan blackberry shrubs (0.01 acre). Himalayan blackberry is non-native and highly invasive with a Cal-IPC rating of High, often outcompeting and replacing native vegetation (Cal-IPC 2023). Dominant species in the remaining Scrub-shrub vegetation in the Project Area include arroyo willow (*Salix lasiolepis*), narrowleaf willow, and California rose. Scrub-shrub provides cover, foraging, and nesting habitat for a variety of birds and mammals. Where Scrub-shrub vegetation overhangs water surfaces in the Project Area, it may be classified as SRA habitat, contributing the same habitat functions as SRA created by Riparian Forest vegetation. A total of 0.19 acre (5.0%) of the Project Area is Scrub-shrub habitat (Table 2-9).

Water

The Project Area includes portions of Cache Slough, Lindsey Slough, and Hastings Cut (Figure 2-2). The water surface is largely open in these waterways, but some floating aquatic plant species (common water hyacinth [*Eichhornia crassipes*; Cal-IPC High] and common waterweed [*Elodea canadensis*]) are present in Lindsey Slough. Cache and Lindsey sloughs provide aquatic riverine habitat with gently sloped sand substrates in the shallows along the shorelines. High-quality aquatic fish habitat is present in these areas where overhanging riparian canopy heavily shades the channel margin and instream woody vegetation adds habitat complexity, providing the cover which native fishes—namely juvenile salmonids—require to carry out key behaviors such as foraging, hiding from predators, and sheltering from high water velocity. The nearshore habitat in Cache and Lindsey sloughs is inundated regularly by the tidal cycle, so its usability, extent, and quality vary with tidal stage. Aquatic habitat in Hastings Cut in the Project Area is less suitable for fish and aquatic wildlife species, as it lacks instream complexity and has little overhanging riparian vegetation; additionally, aquatic access to Hastings Cut is limited by the pipes providing the only connection to Cache Slough. The salinity in aquatic habitats in the Project Area is quite low throughout the year; the salinity at Liberty Island (California Data Exchange Center Station LIB), approximately 5 miles downstream of the Project Area, never exceeded 1 part per thousand in water years 2022 or 2023 (DWR 2023, Lewis 1980). A total of

0.51 acre (13.1%) of the Project Area is water (Table 2-9), including approximately 200 ft of SRA habitat along Cache and Lindsey sloughs.

2.4.1.3 Waters and wetlands

Stillwater Sciences biologists (K. Rodriguez, E. Applequist, and C. Bilodeau) conducted a preliminary delineation of potentially jurisdictional wetlands in the Project Area on April 20, 2023, 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 following resources were queried and referenced to inform the delineation:

- USFWS’s National Wetlands Inventory online application, Wetlands Mapper (USFWS 2023b)
- U.S. Department of Agriculture Natural Resources Conservation Service’s Soil Survey Geographic Database (USDA NRCS 2023a), and
- Hydric Soils List for Solano County (USDA NRCS 2023b).

The field delineation of potentially jurisdictional wetlands was conducted following the methods presented in *National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams: Interim Version* (USACE 2022a) and the *Interim Draft Rapid Ordinary High Water Mark (OHWM) Field Identification Data Sheet* (USACE 2022b). 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 3.87-acre Project Area contains no wetlands, 0.80 acre of Waters of the United States, and an additional 1.96 acres under state jurisdiction (i.e., below top of bank) (Table 2-10). The Waters of the United States (associated with Cache Slough, Lindsey Slough, and Hastings Cut) are classified as riverine (tidal) based on the wetland classification standard (FGDC 2013).

Table 2-10. Preliminary Waters of the United States delineated for the Hastings Tract Pipe Replacement Project.

Water feature		Acres in the Project Area		
		Below MHW	Between MHW and HTL	Total
Riverine (tidal)	Cache Slough	0.03	0.01	0.04
	Hastings Cut (north)	0.15	0.01	0.17
	Lindsey Slough	0.22	0.07	0.30
	Hastings Cut (south)	0.27	0.02	0.30
Grand Total		0.68	0.12	0.80

Notes: MHW = mean high water
HTL = high tide line

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

Three special-status plant species were documented within the Project Area, including 45 Delta tule pea plants, 0.8 square feet of Mason's lilaeopsis, and 20 Suisun Marsh aster plants (Table 2-5, Figure 2-1). Additional patches of these three species and one other special-status species, Parry's rough tarplant, were also documented adjacent to the Project Area. Special-status plants within the Project Area could potentially be directly damaged or destroyed by Project construction activities (e.g., excavation). Mason's lilaeopsis and Suisun Marsh aster in the portion of Lindsey Slough enclosed by the cofferdam could also be indirectly affected by temporary reductions in water availability when the cofferdam is in place in Lindsey Slough.

Where possible, impacts to special-status plants will be avoided using protections in mitigation measure **MM-2** (Section 1.4.6). Per mitigation measure **MM-2**, special-status plant surveys will be conducted prior to Project construction, and any special-status plants that could potentially be damaged or destroyed by Project activities will be flagged for avoidance. Measure **MM-2** describes how a qualified biologist will be present to monitor construction activities within established buffers. Where avoidance is not possible, mitigation measure **MM-2** requires development of a Mitigation and Monitoring Plan in consultation with CDFW to mitigate for any losses of special-status plants, and an Incidental Take Permit (ITP) from CDFW will be pursued, if necessary, for any impact to Mason's lilaeopsis. Impacts to special-status plants will therefore be less than significant with mitigation incorporated and compliance with any ITP requirements.

Special-status fish

Special-status fish (as identified by the database queries) that may use the tidally connected waterways surrounding the Project Area (Cache Slough and Lindsey Slough; described in Section 2.4.1.2) have the potential to be impacted by in-water Project activities related to sheet pile cofferdam installation, dewatering, cofferdam removal (Section 1.4.1), as well as from removal of the Project pipes. The tidally connected sloughs (Cache and Lindsey) provide suitable habitat for green sturgeon, Sacramento splittail, delta smelt, longfin smelt, Chinook salmon, and steelhead (see Table 2-6 for details). Hastings Cut provides little or no suitable habitat for special-status fish species because it lacks instream complexity, has little overhanging riparian vegetation, and is connected to Cache and Lindsey sloughs only by the existing pipes on the Cache Slough levee that provide restricted access. The connection and flow of water between Cache Slough and Hastings Cut would not be maintained; instead, a new connection would be established to convey water flow between Lindsey Slough and Hastings Cut. Although fish access from Cache Slough into Hastings Cut would not be maintained, new access from Hastings Cut to Lindsey Slough would be provided post-Project. Because Hastings Cut would continue to be generally accessible to fish with a similar pipe/tide gate structure that was previously between Cache Slough and Hastings, entrainment of fish in Hastings Cut is not anticipated.

The installation of the sheet pile cofferdams and subsequent dewatering could crush or strand individual fish, temporarily disturb or degrade rearing (nursery) and foraging habitat for all seven species, as well as spawning habitat for delta smelt and longfin smelt. The installation could also result in underwater disturbance (e.g., from equipment use, noise, or suspended sediments) that could potentially cause rearing juveniles or other life stages of the special-status fish species to

avoid the Project Area. Installing and stabilizing the pipe outflow on Lindsey Slough would lead to a very small loss of marginally suitable foraging habitat for the special-status fishes. Currently, a boat ramp at the proposed outfall structure does not provide suitable foraging, spawning, rearing, or sheltering habitat for any of the special-status fishes. The loss of any marsh or riparian forest that provides shade and fish cover in the channel margin is expected to be minimal, and post-Project conditions would allow for future riparian vegetation recruitment.

Rock slope protection will be placed at the inlet and outlet structures in Hastings Cut and Lindsey Slough to minimize the potential for erosion (Section 1.4.1.3). Rock slope protection does not generally provide suitable habitat for salmonids and may provide suitable cover for non-native predatory fishes such as largemouth bass. Habitat use studies on the Feather River (Cavallo et al. 2003) and Sacramento River (CDFG 1983, Michny and Deibel 1986, Stillwater Sciences 2009) have shown lower salmonid-rearing densities and higher predator densities along armored banks. Because juvenile salmonids are typically associated with banks, they may be at higher risk of predation in areas with rock slope protection. Conversion of natural (or naturalized) banks to rock slope protection may also increase predation risk for smelts (e.g., delta smelt or longfin smelt), but they are somewhat less vulnerable to predators along banks because they tend to be pelagic, spending time in open water farther from shore. Green sturgeon are primarily benthic and are not as vulnerable to these predators, so there would not be effects on sturgeon.

In-water work (i.e., sheet pile cofferdam installation, dewatering, and cofferdam removal) will be conducted August 1 through November 30 (Section 1.4.4), a period when the presence of special-status fish in the Project Area is least likely or limited to specific life stages (Table 2-7). The juvenile or adult life stages of these species would have the ability to leave the vicinity during disturbance. While delta smelt and longfin smelt may spawn within the Project Area, spawning is expected to occur outside the August 1–November 30 in-water work window. If spawning by delta smelt or longfin smelt occurs within the Project Area, eggs likely would have hatched when in-water work begins.

Implementation of conservation measures **CM-3** through **CM-6** would protect water quality during Project activities and reduce the potential for adverse effects on special-status fish species and their habitat. Additionally, the implementation of mitigation measures **MM-6** through **MM-8** (the creation of a Fish Capture and Relocation Plan, requirements for sheet pile cofferdam installation and removal, and requirements for dewatering activities and pumps) would avoid or minimize adverse effects on special status fishes and their habitat during dewatering, cofferdam installation and removal, and construction. With the implementation of applicable conservation and mitigation measures, potential disturbances on aquatic habitats within the vicinity of the Project Area (e.g., from suspended sediment, sedimentation, or underwater noise) would be limited during the installation and removal of turbidity control devices and the cofferdams and are anticipated to have minimal adverse impacts on fish species. With implementation of these conservation and mitigation measures, effects on special-status fishes would be less than significant.

Special-status wildlife

California tiger salamander

While there is low likelihood for California tiger salamander to be encountered during Project implementation, the species is analyzed because of the Project Area's proximity to potential (but unconfirmed) breeding habitat. The Project Area itself does not contain suitable breeding habitat (e.g., ponds or vernal pools). However, there is scattered suitable breeding habitat (ephemeral depressions and ponding) in managed agricultural fields to the west, north and northwest of the Project Area, within the species' maximum dispersal distance (1.3 miles; Orloff 2011). From

aerial imagery, these nearby agricultural fields and pasturelands appear to have been regularly disturbed (e.g., plowed or tilled) as recently as 2022. This frequent ground disturbance reduces suitability of upland refugia habitat. There is an agricultural ditch located along the perimeter of Hastings Cut, which is unsuitable for California tiger salamander breeding because of fish presence, observed during the 2024 habitat assessment.

The Project Area does not contain suitable upland refugia habitat for California tiger salamander. The Project Area and vicinity did not contain any burrows, large cracks, or evidence of California ground squirrel (*Otospermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), or other burrowing mammal activity. The soils in the Project Area are categorized as clays (Clear Lake clay and Sacramento clay; NRCS2024), less likely to be used by mammals for burrowing or creating subterranean habitat used by salamanders. Additionally, the Project Area contained ruderal vegetation composed of dense, tall grasses, less suitable for salamander movement and dispersal. Open areas in the Project Area were gravel or compacted, with shallow expansion cracks that were not deep enough for long-term subterranean salamander refugia.

The vernal pool habitat where breeding has been documented in CNDDDB (CDFW 2024), comprised of a patchwork of vernal pools surrounded by upland grassland habitat approximately 2 miles away from the Project Area, is part of the Elisie Gridley Mitigation Bank. This mitigation bank contains highly suitable natural and created vernal pools interspersed among grazed uplands. Other highly suitable grasslands for California tiger salamander extend to the north of these occupied vernal pools, providing additional adjacent high-quality habitat, in contrast to lower quality habitat in the vicinity of the Project Area.

Based on these conclusions, there would be no impacts on California tiger salamander. Additionally, the implementation of conservation measures and mitigation measure **CM-1**, **CM-2**, and **MM-1** (including reduced speed limits, cease work if species is detected, and an environmental awareness training) will further ensure that there would be no impacts on the species.

Giant garter snake

The waterways and associated uplands of Cache Slough, Lindsey Slough, and Hastings Cut provide suitable foraging and marginally suitable basking or overwintering habitat for giant garter snakes. Project activities near these areas could obstruct giant garter snake movement and feeding activities, fill or crush burrows or crevices potentially used for cover (via use of heavy machinery), and result in the disturbance (via vibration, human presence), displacement, injury, and/or mortality (e.g., vehicle collisions) of individual giant garter snakes. Potential for injury or mortality of a snake is low because the Project Area contains marginal upland habitat (mostly composed of disturbed areas, tall ruderal vegetation, and existing roadways where no burrows were observed). Furthermore, giant garter snakes are sensitive to human activities and will typically flee to avoid people or disturbances.

The loss of foraging habitat (i.e., aquatic habitat) during dewatering, the removal of vegetation (including upland, emergent, or aquatic), and changes to the marginal upland habitat in the Project Area will all be temporary. As such, there will be no significant adverse impacts on general habitat availability for giant garter snakes following the Project.

The implementation of mitigation measure **MM-5** (limiting ground disturbance to the snakes' active season, a preconstruction survey and burrow assessment, removal of prey items during dewatering, and restriction of mono-filament netting) will reduce the likelihood that a snake would enter the Project Area for foraging during ground-disturbing activities. Additionally, the

implementation of conservation measures (Section 1.4.5) and mitigation measures **CM-1**, **CM-2**, and **MM-1** (including reduced speed limits, cease work if species is detected, and an environmental awareness training) will further minimize the potential for impacts on the species to less-than-significant levels.

Northwestern pond turtle

Northwestern pond turtles that may occur in Cache Slough, Lindsey Slough, or Hastings Cut in or near the Project Area will likely disperse away from areas affected by Project activities. However, turtles that may use uplands in the Project Area could be impacted by Project activities, such as colliding with vehicles or construction equipment. There is no suitable nesting upland habitat for the species in the Project Area, so impacts on nests are not anticipated. Temporary removal or degradation of suitable aquatic or basking habitat would be limited to the smallest amount feasible. Implementation of conservation measures **CM-1** and **CM-2** (including reduced speed limits and ceasing work if species is detected) and mitigation measures **MM-1**, **MM-3**, and **MM-8** (environmental awareness training, preconstruction survey, and the use of screens on dewatering pumps) would reduce impacts on the species to less-than-significant levels.

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 September 15) could lead to direct (e.g., failure or abandonment of an active nest, collision from vehicles or heavy machinery) or indirect impacts (e.g., loss of suitable breeding or foraging habitat) 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).

The Project Area contains suitable habitat for arboreal or riparian nesting special-status species (including Swainson's hawk, white-tailed kite [*Elanus leucurus*], loggerhead shrike [*Lanius ludovicianus*], or yellow-headed blackbird [*Xanthocephalus xanthocephalus*]) in the mature trees found in the Riparian Forest or Scrub-shrub habitats (along Cache and Lindsey sloughs and Hastings Cut) and the dense ruderal herbaceous vegetation in and near the Project Area provides suitable nesting habitat for ground or low-lying vegetation nesting special-status species (including Modesto song sparrow [*Melospiza melodia*], western burrowing owl, or northern harrier [*Circus hudsonius*]), and migratory birds.

There are a few special-status species that may use the Project Area or vicinity for foraging only, including the American white pelican (*Pelecanus erythrorhynchos*), tricolored blackbird (*Agelaius tricolor*), mountain plover (*Charadrius montanus*), and short-eared owl (*Asio flammeus*). Foraging habitat may be disturbed temporarily during Project construction by the removal of vegetation. While these actions may lower the quality of foraging habitat for some species, the effects will be temporary, foraging birds can easily disperse away from Project-related disturbances, and the presence of extensive alternative foraging habitat of similar value means the impact on foraging birds and habitat will be less than significant.

Implementation of mitigation and conservation measures **MM-1**, **MM-9**, and **CM-1** (including environmental awareness training, preconstruction survey(s) [and applicable no-disturbance buffer for active nests], and reduced speed limits on Project roads) will minimize the potential for direct impacts (e.g., injury or mortality, nest failure) to less-than-significant levels. Project activities that include (or require) vegetation removal will be kept to the minimum amount feasible.

Additional measures include preconstruction nesting bird surveys for target special-status birds, including **MM-4** for Swainson's hawk, **MM-10** for western burrowing owl, and **MM-11** for black rails. These species-specific measures will help limit the potential for reproductive failure of target species if nests are discovered prior to the Project. In addition, if work needs to be conducted within the no-disturbance buffers discussed in measures **MM-4**, **MM-9**, **MM-10**, and **MM-11**, a biological monitor will observe the work to ensure that the nesting individuals are not disturbed or impacted. Lastly, general BMPs related to equipment maintenance, erosion control materials, and spill prevention will further reduce the potential for impacts on the species. With the inclusion of conservation and mitigation measures, potential impacts to special-status birds will 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?

Excavation and replacement of the Cache Slough and Lindsey Slough levees will require removal of no more than 0.07 acre of Freshwater Marsh, 0.15 acre of Riparian Forest (including 0.02 acre of Oregon ash groves [S3.2] and 0.05 acre of valley oak riparian forest and woodland [S3]) , and 0.18 acre of Scrub-shrub vegetation (including 0.01 acre of California rose briar patches [S3]) (Table 2-9), also potentially resulting in a minor loss of SRA habitat in the adjacent waterways. Project construction will help ensure long-term stability of these habitat types on Hastings Tract, as it will help prevent pipe or levee failure that could result in larger scale habitat losses. Impacts will be less than significant.

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 above the high tide line; however, the Project Area encompasses 0.80 acre of riverine (tidal) Waters of the United States, which are federally and state protected, and an additional 1.96 acres under state jurisdiction (i.e., below top of bank). Rock slope protection 2 ft in depth will be placed extending approximately 17 ft and 10 ft from the inlet/outlet structures in Hastings Cut and Lindsey Slough, respectively, to minimize the potential for erosion and protect levee integrity. The Project also includes temporary placement of sheet pile cofferdams in Lindsey Slough and Hastings Cut but has been designed to minimize adverse impacts to Waters of the United States by limiting the in-water work areas and areas enclosed by cofferdams to include the minimum extent practicable. The cofferdams will not span the entire width of Lindsey Slough and will therefore not completely inhibit flow or impede navigation. Although the sheet pile cofferdams will interrupt the managed surface connection between Hastings Cut and Cache Slough, the downstream connections of Lindsey and Cache sloughs to the Sacramento River and Cache Slough, respectively, will be maintained throughout Project construction. Hastings Cut's hydrological connection will be restored following pipe installation along Lindsey Slough and Project completion. Additionally, the Project's removal of the deteriorated pipe between Cache Slough and Hastings Cut will reduce the potential for levee failure and adverse impacts to associated waters and wetlands in the Project vicinity. Impacts will therefore 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 Project includes modifications to existing levee and tide control infrastructure and will not include construction of any new elements that will block fish or wildlife movement post Project. Existing tide control structures and equipment do not allow fish passage into or out of Hastings Cut and Lindsey Sloughs. Current operations may allow fish passage between Hastings Cut and Cache Slough, which will not be maintained post-Project. However, the Project would create a new passage between Hastings Cut and Lindsey Slough. The cofferdams on the Lindsey Slough side will be temporary and no long-term effects to fish movement, migration, or nursery sites are anticipated. Therefore, the Project will not interfere substantially with the movement of any native resident fish or wildlife species. The installation of cofferdams in Lindsey Slough (which could be used by migrating fish) will be limited to small inlets and will not block the entirety of the slough. As such, fish passage through Lindsey Slough will not be impeded. Similarly, Project activities will not impede the use of any fish nursery sites.

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

The Project will not conflict with any local policies or ordinances protecting biological resources. There will 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 will not conflict with any provisions of an adopted or approved (local, regional, or state) Habitat Conservation Plan or Natural Community Conservation Plan. The Project does not conflict with the purpose or goals of the Solano Multispecies Habitat Conservation Plan (developed by the Solano County Water Agency in 2012) which promote the conservation of biological diversity and preservation of endangered species (and their habitats), to provide a healthy economic environment (for citizens, agriculture, and industries), and allow for the ongoing maintenance and operation of public and private facilities (Solano County Water Agency 2012).

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

The Natural Investigations Company conducted a cultural and paleontological resources assessment for the Project, which included a search of records for known cultural resources in the Project Area and vicinity, and an intensive pedestrian survey of the Project Area (Natural Investigations Company 2023). Results of the assessment are synthesized in this section. The full report contains confidential information (e.g., Sacred Lands File [SLF] search results) in addition to pre-contact historic, ethnographic, and post-contact historic context of the region and is available to relevant agencies upon request.

2.5.1.1 California Historical Resources Information System search

The Northwest Information Center (NWIC) at Sonoma State University conducted a California Historical Resources Information System (CHRIS) records search to determine whether prehistoric or historic cultural resources were previously recorded in the vicinity of the Project (i.e., within 0.5 mile of the Project Area). The results of the CHRIS search were returned on October 11, 2022. CHRIS records indicate that four prior cultural resource studies have been completed within the Project Area, and seven additional studies have been completed within the 0.5-mile record search radius. CHRIS records indicate that no cultural resources have been previously recorded within the Project Area, but four sites have been previously recorded within the search radius (Natural Investigations Company 2023). All previously recorded cultural resources within 0.5 mile of the Project Area are prehistoric; no historic cultural resources have been previously recorded.

2.5.1.2 Sacred Lands File search and Native American outreach

The Native American Heritage Commission (NAHC) returned the results of a SLF records search on November 28, 2022. The SLF results were negative for Native American resources in the vicinity of the Project (Natural Investigations Company 2023).

The Natural Investigations Company sent Project information letters to all tribal members or organizations affiliated with the region, as provided by NAHC, on November 28, 2022 (Natural Investigations Company 2023). If no response was received, follow-up phone calls were made on December 13, 2022. To date, no additional information has been received that indicates the potential presence of tribal cultural resources in the Project Area. However, one Tribe has reached out to initiate formal consultation with the District for the Project.

2.5.1.3 Potential for buried archaeological deposits

As supported by CHRIS records, the Project vicinity includes landforms that are sensitive for the presence of buried deposits of cultural resources. The Project Area, however, is in a disturbed context (i.e., fill material used to construct the existing levees), so Project construction would not likely disturb any native soils. Therefore, although the Project vicinity is sensitive for buried deposits of cultural resources, the Project is very unlikely to impact buried cultural resources.

2.5.1.4 Pedestrian survey

On October 27, 2022, Natural Investigations Company archaeologist A. Dang conducted an intensive pedestrian survey of the Project Area (Natural Investigations Company 2023). The survey was conducted along transects spaced no more than 15 meters apart and included transects throughout the Project Area and along the haul route. Transects were carefully examined for cultural material (e.g., flaked stone tools, tool-making debris, fire-affected rock), soil

discoloration that might indicate the presence of a cultural midden, soil depressions and features indicative of the former presence of structures or buildings (e.g., postholes, foundations), or historic-era debris (e.g., metal, glass, ceramics).

The field survey identified and documented the Lindsey Slough levee (NIC-2022-HT-01) as a previously unrecorded cultural resource. The Lindsey Slough levee is an earthen levee constructed no later than 1942. However, it does not appear to meet any of the eligibility criteria for inclusion on the National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR) (e.g., association with significant events or individuals, unique construction or design characteristics).

2.5.2 Findings

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

The Lindsey Slough levee (NIC-2022-HT-01) is the only historical resource identified within the Project Area but is not eligible for inclusion on the NRHP or CRHR. Therefore, the Project will not cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5. The Project will have no impact.

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

The Project vicinity includes landforms that are sensitive for the presence of buried archaeological resources. The vertical extent of the Area of Potential Effects (APE) for the Project, however, is in a disturbed context (i.e., fill material used to construct the existing levees), so Project construction would not likely disturb any native soils. Therefore, although the Project vicinity is sensitive for buried archaeological deposits, they are not expected within the Project's vertical APE. The Project will have no impact.

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

Records searches, Native American outreach, and an intensive pedestrian survey have not indicated any historic or prehistoric resources, including human remains, within the Project Area. Additionally, the vertical extent of the Project's APE is in a disturbed context (i.e., fill material used to construct the existing levees), so Project construction would not likely disturb any native soils. Therefore, the Project will not disturb any human remains; there will be no impact.

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 combusted to power vehicles and equipment or converted to electricity as a secondary energy source.

In 2021, California consumed more energy than all other states except Texas, but its per capita consumption of 189 million British thermal units (Btu) was the fourth lowest in the nation (USEIA 2023). The California Energy Commission (CEC), established by the Warren-Alquist Act in 1974 (Section 6.2), has been instrumental in limiting California's energy consumption, particularly via energy efficiency standards that are updated every three years in Title 24 (CEC 2023).

The Project will utilize fossil fuels, a nonrenewable energy source, to power construction vehicles and equipment. The fossil fuel consumption will be on a short-term basis during construction and will not persist upon Project completion. No electricity consumption will 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 and vehicles will use fossil fuels for power. BMPs included in conservation measure **CM-1** will ensure construction equipment will be used as efficiently as feasible (e.g., by limiting idling) (Section 1.4.5). Fossil fuel consumption will be on a short-term basis during construction and will not persist upon Project completion. No electricity consumption will be associated with the Project. The impact will therefore be less than significant.

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

The Solano County General Plan includes policies to promote renewable energy use and energy efficiency. In accordance with policy RS.P-54 and implementation program RS.I-48, Project construction will utilize vehicles model year 2010 or newer and diesel-fueled construction equipment in compliance with CARB's In-Use Off-Road Diesel-Fueled Fleets Regulation (conservation measure **CM-1**, Section 1.4.5). Other state and local plans such as California Title 24 Building Energy Efficiency Standards and the Solano County General Plan establish energy efficiency standards for actions (e.g., new building construction, retrofitting existing developments) that are not associated with the Project. As such, the Project will not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. There will 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?	☐	☐	☐	✓
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 zones that predominately exhibit right-lateral, strike-slip motion. The closest active faults⁴ designated by the California Geological Survey (CGS) are the Greenville Fault Zone and Green

⁴ An “active fault” is defined by the California Geological Survey as a fault having surface displacement within the Holocene epoch, or the past 11,700 years (CGS 2018).

Valley-Concord fault zones, located about 21 and 23 miles to the southwest, respectively (CGS 2018, 2022). The closest potentially active fault is the Midland Fault Zone, which runs north-south through the Delta, including along the northern portion of the Project Area near Cache Slough (Unruh and Hitchcock 2009). The most recent displacement along this fault is estimated to be early- to mid-Quaternary (0.7–2.6 million years before present) (CGS 2010).

The Greenville and Green Valley-Concord faults both have estimated slip rates of 1–5 millimeters per year (Bryant and Cluett 2002a,b). The USGS estimates a 16 percent 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). In general, ground rupture hazards do not affect Solano County. Delta islands are, however, susceptible to liquefaction because of shallow groundwater depths and the presence of sandy-peaty soils with low cohesive strength (CGS 2018, San Joaquin County 1992). Liquefaction or seismically induced waves (i.e., seiches) in Delta channels may damage levees on Delta islands (San Joaquin County 1992).

The northern portion of Hastings Tract (near Cache Slough) is composed of flood-basin deposits, and the southern portion (near Lindsey Slough) is composed of peat and mud of tidal wetlands and waterways. Both deposits 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).

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 within the Alquist-Priolo Earthquake Fault Zone (CGS 2022) or a California Earthquake Hazards Zone (California DOC 2021). The Project will result in no operational or land use change that will cause substantial adverse effects due to potential rupture of an earthquake fault. Therefore, the Project will have no impact.

ii) Strong seismic ground shaking?

The Project Area is not located near active faults and therefore lies in a zone with low potential for strong seismic ground shaking. The Project will not increase the potential for direct or indirect adverse effects related to seismic ground shaking. Therefore, the Project will have no impact.

iii) Seismic-related ground failure, including liquefaction?

The Project Area lies in the Delta, which is potentially susceptible to seismically induced liquefaction that could result in levee failure and flooding. The Project will not increase

the potential for direct or indirect adverse effects due to seismic-related ground failure. Therefore, the Project will have no impact.

iv) Landslides?

Except for the levees surrounding the tract, the Project Area has a flat topography and is not susceptible to landslides. The Project will re-construct the levees to their existing grades and will not increase the potential for direct or indirect adverse effects related to landslides. Therefore, the Project will have no impact.

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

The Project will remove topsoil during excavation at both sites. Due to the flat topography of the Project Area, removal of this material will not result in substantial potential for erosion. During active construction, there will 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 will implement BMPs in conservation measure **CM-3** (Section 1.4.5) (e.g., limiting construction activities to dry periods). Levees will be restored to pre-construction contours upon completion of construction activities, and any areas with bare ground will be re-seeded with a native seed mix. Impacts of the Project on soil erosion and loss of topsoil will 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 Project Area is located on Quaternary Delta mud and peat deposits which are susceptible to liquefaction. However, because the Project will relocate pipes within levees that will be re-constructed to their original grade, the Project will not increase susceptibility to hazards associated with unstable geologic units. Therefore, the Project will have no impact.

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?

Soils in the vicinity of the Project (i.e., peat and organic materials) are expansive. The Project has, however, been designed to address the potential for expansive soil. Expansive soils will not be used to re-construct the Cache Slough and Lindsey Slough levees. The Project will utilize Soil Type 1 or Type 2 for all embankment fill (MHM 2023). The Project will not increase long-term deformation or risks to life and property compared to existing conditions. Additionally, no residences or structures are located on Hastings Tract in the vicinity of the Project Area. Therefore, the Project will not create substantial direct or indirect risks to life or property by being located on expansive soil; there will be no impact.

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?

The Project will not utilize septic tanks or alternative wastewater disposal systems. The Project will 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 Hastings Tract. 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. Additionally, all Project excavation work will occur in levees composed of imported fill material rather than in naturally deposited soils. The Project will 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

GHGs can absorb and emit infrared radiation, trapping energy in the atmosphere and causing it to warm. GHGs have impacts that are more global than regional, unlike 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.

California GHG emissions decreased 15% from their 2004 peak to 418.4 million metric tons of carbon dioxide equivalent (CO₂e) in 2019, while statewide per capita emissions decreased by 25% from their peak in 2001 to 2019 (14.0 metric tons per person to 10.5 metric tons per person) (CARB 2021). In 2020, California GHG emissions decreased further to 369.2 million metric tons of CO₂e; however, the magnitude of this decrease is likely an anomaly related to impacts of the COVID-19 pandemic (e.g., reduced transportation due to shelter-in-place orders) rather than an accurate indicator of long-term GHG emission trends (CARB 2022). The transportation sector

consistently emits more GHG than any other sector, accounting for almost 40% of state GHG emissions in 2019 (CARB 2021).

In January 2008, AB 32 (Section 6.2), the Global Warming Solutions Act of 2006, went into effect. This bill required CARB to develop regulations to address global climate change due to GHG emissions. The act also required a statewide GHG emissions limit, equal to the 1990 level, as a limit to be achieved by December 31, 2020. The 2020 GHG emissions limit was 431 million metric tons of CO₂e, and, as of 2017, statewide GHG emissions were 424 million metric tons of CO₂e (CARB 2019). Signed into law in 2020, AB 1279 expanded upon AB 32 by specifying an emissions limit which further requires California to reduce statewide GHG emissions to 85 percent below 1990s level by 2045.

The YSAQMD has not established a numerical threshold of significance for assessing impacts associated with Project GHG emissions but recommends evaluation of incremental impacts to determine if they may be cumulatively considerable. The YSAQMD and the Solano County Climate Action Plan also provide GHG emission reduction measures and actions that can be implemented to limit potential Project impacts consistent with state and county emissions goals (Solano County 2011).

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 only 123 metric tons of CO₂e between May and November 2025, as indicated by the CalEEMod results in Appendix A. The Project will not result in changes to long-term GHG emissions following construction. Therefore, short-term impacts involving the generation of GHG emissions during Project construction will 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?

Emissions associated with Project construction will be temporary and will not inhibit attainment of the statewide GHG emissions limit established by AB 1279, as described in Section 6.2. The YSAQMD has not established quantitative significance thresholds for GHG emissions, but the YSAQMD and the Solano County Climate Action Plan recommend emission reduction measures consistent with long-term state and county emissions goals. Although most recommended measures apply to development projects or ongoing operational (e.g., industrial, commercial) uses rather than construction activities, the Project includes recommended measures where possible to limit GHG emissions and protect GHG storage (i.e., carbon sequestration) during or following construction activities (e.g., reduced idling times in **CM-1** [Section 1.4.5], re-seeding bare soil with a native seed mix following construction activities in **CM-3**). The Project will not result in changes to long-term GHG emissions following construction. The Project will therefore not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions; there will 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?	☐	☐	☐	✓
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, recreational, and open space, along with some residential use. These areas have the potential to contain hazardous substances, particularly petroleum products or pesticides that may have been stored nearby 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 that can lead to the contamination of soil or groundwater. A query of the California Department of Toxic Substances Control's database revealed no known sites in the Project Area with cleanup, permitted, or other hazardous materials statuses (CDTSC 2023).

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) will be used by construction equipment during Project implementation. To minimize the risk of a hazardous material release, the Project will implement hazardous material BMPs, as outlined in conservation measures **CM-4** and **CM-5** (Section 1.4.5). All fuels and other hazardous materials will be handled and stored according to the manufacturer's specifications. A containment area will be established for construction equipment staging, and the ground will be protected from potential contamination within the containment area. In the event of a spill, crew personnel will stop the spillage at its source, contain the spilled material, and notify Project supervisors and appropriate agency representatives.

The Project will have no potential impacts associated with hazardous material use following Project completion.

Impacts related to the transport, use, or disposal of hazardous materials will be less than significant with compliance with applicable regulations and incorporation of conservation measures **CM-4** and **CM-5**.

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?

As stated above, implementation of hazardous material BMPs outlined in **CM-4** and **CM-5** (Section 1.4.5) will occur during Project implementation; therefore, any impact will 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?

There are no schools located within one-quarter mile of the Project Area. The Project will have no impact.

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 2023). The Project will have no impact.

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?

The Project Area is located along the eastern boundary of the Travis Air Force Base Airport Influence Area covered by the Travis Land Use Compatibility Plan (Solano County 2008). However, the Project Area is approximately 7 miles from Travis Air Force Base's nearest facilities (i.e., runway) where safety hazards and excessive noise would be most likely due to the

higher concentration of planes and associated equipment and materials. Project construction workers are therefore not expected to be exposed to safety hazards or excessive noise from operations at Travis Air Force Base or the occasional flight over the Project Area. There are no public-use airports within 2 miles of the Project Area. The Project will 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 Hastings Tract would evacuate the tract via routes that do not cross the Project Area; thus, there will be no disruption to emergency evacuation routes. All roadway traffic supporting the Project will adhere to applicable laws for motor vehicles and with Solano County's Office of Emergency Services. The construction contractor will comply with local fire, police, and medical responders during any emergency. For these reasons, there will be no impact.

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

Hastings Tract has been designated by the California Department of Forestry and Fire Protection (CalFire) as an unzoned local responsibility area⁵ with no moderate, high, or very high fire hazard severity zones (CalFire 2022). Accordingly, the Project will not expose people or structures to a significant risk of loss, injury, or death involving wildland fires. In addition, the Project will implement **CM-7** (Section 1.4.5) to reduce the potential for a grass fire. Therefore, the Project will have no impact.

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;	☐	☐	✓	☐

⁵ 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
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	☐	☐	☐	✓
(iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☐	✓
(iv) impede or redirect flood flows?	☐	☐	☐	✓
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?	☐	☐	☐	✓
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	✓

2.10.1 Environmental setting

The Project Area is within the Cache Slough (Hydrologic Unit Code [HUC] 180201630606) and Lindsey Slough (HUC 180201630604) watersheds (USGS 2023). Waterways within the Project Area include a portion of Lindsey Slough to the south and Cache Slough to the north, as well as the adjacent portions of Hastings Cut (Figure 1-2). Hastings Cut is currently connected to Cache Slough via pipes through Hastings Tract's perimeter levee. Lindsey Slough flows into Cache Slough at its easternmost end, and Cache Slough flows into the Sacramento River approximately 5 miles east of the Project Area (USACE 2023). Lindsey Slough, Cache Slough, and Hastings Cut are included on the list of Traditional Navigable Waters maintained by the United States Army Corps of Engineers (USACE) Sacramento District (USACE 2023).

The Project Area experiences a Mediterranean climate characterized by hot, dry summers and cool, wet winters. Average annual rainfall in the Project Area between 1991 and 2020 was 16 inches, with the majority typically occurring between October and April (PRISM Climate Group 2023). Water levels in the adjacent waterways fluctuate daily with tidal action and episodically during flood events coinciding with periods of heavy precipitation and runoff. Hastings Tract is currently mapped within Federal Emergency Management Agency's (FEMA's) 100-year floodplain designation (FEMA 2023).

There are no tsunami risks in the Project Area or vicinity according to the State of California's tsunami hazard area map (California DOC 2023b). Earthquakes along any of the active fault zones in the vicinity of the Project (Section 2.7.1), however, could result in seiches in the waterways in the Project Area, and potential effects of a seiche could be compounded by adverse tidal conditions.

Water quality objectives and beneficial uses for surface water and groundwater are in the Water Quality Control Plan for the Central Valley (Basin Plan) (Central Valley RWQCB 2019). The water quality objectives apply to all surface waters in the Sacramento and San Joaquin river basins, including the waterways within the Project Area (i.e., Cache Slough, Lindsey Slough, and Hastings Cut). Existing and potential beneficial uses for the Delta include municipal and domestic

supply, agricultural supply (irrigation and stock watering), industrial supply (process and service), recreation (contact and 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 Delta waterways (northwestern portion), including the waterways in the Project Area, have been classified as *impaired* by the State Water Resources Control Board (SWRCB) (SWRCB 2022). This designation, as specified in the Basin Plan, is assigned to waterbodies where established water quality objectives are not being met or where beneficial uses are not protected. The SWRCB has classified the Delta waterways (northwestern portion) as *impaired* for electrical conductivity, mercury, pesticides (chlorpyrifos, diazinon, dichlorodiphenyltrichloroethane [DDT], and group A pesticides), toxicity, and invasive aquatic species (SWRCB 2022). Classification of a waterbody as *impaired* on the 303(d) list triggers the development of a pollution control plan, called a Total Maximum Daily Load (TMDL). The TMDL 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. The Project will implement a SWPPP with BMPs to minimize the potential for soil erosion and stormwater runoff (conservation measure **CM-3**, Section 1.4.5) and accidental spills of hazardous materials to enter waterways and groundwater (conservation measures **CM-4** and **CM-5**). Additionally, cofferdams will be installed around areas where excavation occurs below the elevation of the high tide line, and sediment booms, silt curtains, or other appropriate turbidity control devices will be installed and maintained around in-water work areas not fully enclosed by a sheet pile cofferdam (**CM-6**) to protect the surrounding waterways from siltation during in-water activities. During in-water work (e.g., installing cofferdam sheet piles in Lindsey Slough and Hastings Cut around the new pipe location), the Project's SWPPP will also include turbidity monitoring if sediment plumes are visible outside the turbidity control devices or sheet pile cofferdams to ensure they are functioning properly. To reduce erosion upon completion of construction, disturbed areas will be seeded with a native seed mix (**CM-3**), and the levee crown will be covered with compacted aggregate base placed along its surface to re-create the levee road. The levees surrounding the pipes will be reconstructed to the original grade, which varies between approximately 6:1 (horizontal to vertical) and 3:1 (horizontal to vertical), so the Project will not result in any long-term changes to drainage patterns or erosion. With implementation of conservation measures **CM-3** through **CM-6**, impacts to surface or ground water quality will 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 will not alter existing groundwater pumping rates or natural recharge potential on Hastings Tract. The Project will 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 will temporarily disturb soils and alter runoff patterns over a small area during Project construction. Appropriate BMPs included in the Project SWPPP will be implemented to minimize potential temporary impacts on waters from erosion during Project construction (conservation measure **CM-3**, Section 1.4.5). The topography of the Project Area will be returned to existing grades and revegetated following Project construction, and no new impervious surfaces will be created. Therefore, there will be no substantial long-term change in erosion or siltation on or off site. The Project will have a less than significant impact.

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

The Project will not substantially alter drainage patterns following construction. Earth-moving activities during construction have the potential to cause minor alterations to the existing drainage patterns in a manner that would not result in an increased risk of flooding. The Project will 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 will not create or contribute runoff water or provide additional sources of polluted runoff. The Project will have no impact.

iv) impede or redirect flood flows?

Project construction will be completed during late summer or early fall when precipitation in the region and the risk of resulting floods are extremely low, and Project implementation will result in no long-term changes to flood flow patterns. There will be 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. 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-4** and **CM-5**, Section 1.4.5) would minimize the risk of a pollutant release. The Project will not risk release of pollutants following Project construction. The Project will 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 will not conflict with or obstruct the implementation of the Basin Plan (Central Valley RWQCB 2019) or any sustainable groundwater management plan (Solano Collaborative 2021) as it will not chronically lower groundwater levels, reduce groundwater storage, or degrade water quality by increasing concentrations of constituents of concern (nitrate, arsenic, chloride, total dissolved solids, or hexavalent chromium). There will be 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 applicable 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 Hastings Tract under the Solano County General Plan (Solano County 2008) is Agriculture. The Agriculture designation includes areas for the practice of agriculture as the primary use and allows for secondary uses that support the viability of agriculture. The tract falls within the Elmira and Maine Prairie agricultural region (Solano County 2008) and contains areas of Prime and Unique Farmland and Grazing Land (Section 2.2.1).

Hastings Tract is also part of the Delta Primary Zone, as defined by the Delta Protection Act of 1992 (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).

Hastings Tract is located within the boundary covered by the Delta Plan, a comprehensive, long-term management plan for the Delta and Suisun Marsh mandated by the 2009 Delta Reform Act (Section 6.2) (Delta Stewardship Council 2019). The Delta Plan 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.

2.11.2 Findings

a) Would the Project physically divide an established community?

There are no established communities located on Hastings Tract, and the Project will not change the character of or access to any of the residences or farm buildings on the tract; therefore, the Project will 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 will not result in any long-term changes to land use on Hastings Tract and therefore will not conflict with any goals or policies in the Solano County General Plan (Solano County 2008), the Land Use and Resource Management Plan for the Primary Zone of the Delta (DPC 2010), or the Delta Plan. The Project will have no impact.

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 found in the Delta. Extraction of peat and sand-gravel occurs on some Delta islands. No mineral extraction activities currently occur on Hastings Tract. To date, land on Hastings Tract has not been classified into mineral resource zones, as pursuant to the California Surface Mining and Reclamation Act of 1975 (SMARA; Section 6.2) (Solano County 2008).

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?

There are no known mineral resources in the Project Area. The Project will 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?

There are no known mineral resources in the Project Area. The Project will therefore not conflict with a local plan and will 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**2.13.1.1 Noise**

Noise can be defined as unwanted sound. Pressure waves traveling through air exert a force registered by the human ear as sound, which is measured using monitoring instruments in units of decibels (dB). A whisper is about 30 dB; normal speaking is roughly 60 dB; and a shout is approximately 110 dB (CDC 2022). Long-term exposure to noises exceeding a level of 70 dB can cause negative effects, including 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). Construction noise levels are often expressed in units of A-weighted decibels (dBA), which represent the overall noise as adjusted in frequency to approximate typical human hearing sensitivity.

Noise on Hastings Tract is primarily created by boat traffic along adjacent waterways, recreational activities (e.g., hunting), and routine agricultural equipment and vehicles. The noise-sensitive receptor nearest to the Project Area is the rural residence on the opposite side of Cache Slough, approximately 650 ft away. Other rural residences in the vicinity are greater than 1 mile from the Project Area.

Solano County does not currently have a noise ordinance, but the Solano County Code (Section 28.70.10) includes general development standards preventing noise exceeding 65 dBA at any property line.

2.13.1.2 Vibration

Vibrations are periodic oscillations of a medium, including groundborne vibrations caused by machinery or construction equipment. Groundborne noise is produced by the vibration of other objects, such as room surfaces, resulting from groundborne vibrations. Vibrations are typically measured by their root mean squared velocity expressed as vibration decibels (VdB). Vibrations begin to be perceptible at approximately 65 VdB, become 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 vehicular traffic, including routine agricultural and maintenance vehicles and equipment.

The Solano County Code (Section 28.70.10) prohibits offensive vibrations that are detectable beyond any property line.

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?

Typical construction equipment noise levels for the Project are estimated to be between 77 and 85 dBA, 50 ft from the source (Table 2-11). Expected noise levels were also calculated at 650 ft from the equipment (i.e., the distance to the nearest noise-sensitive receptor) (FTA 2018). The expected noise levels of Project construction equipment 650 ft from the source would be no greater than 59 dBA (Table 2-11), and up to four pieces of the loudest construction equipment (i.e., dozer, excavator, grader) could be run simultaneously without exceeding noise levels of 65 dBA.

Table 2-11. Expected construction equipment noise levels and usage.

Equipment	Acoustical usage factor (%) ¹	Expected noise level (dBA) from 50 ft	Expected noise level (dBA) from 650 ft
Compactor	20	82	53
Dozer	40	85	59
Excavator	40	85	59
Grader	40	85	59
Loader	40	80	54
Pump	50	77	52
Truck	40	84	58

Source: FHWA (2017)

Notes: dBA = A-weighted decibels
ft = feet

¹ Percentage of time equipment generates noise at the maximum level

As indicated in Table 2-11, noise levels during Project construction are expected to be below the Solano County Code development standard of 65 dB at the nearest residence. Additionally, there will be no long-term increase in noise generation following Project construction. Therefore, the Project will not result in generation of a substantial increase in ambient noise levels in excess of local standards; the impact will be less than significant.

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

Vibration levels for heavy equipment and loaded haul trucks to be used during Project construction are not expected to exceed 87 VdB, 25 ft from the source, or 65 VdB, 135 ft from the source (FTA 2018), so groundborne vibration resulting from Project construction activities is not anticipated to be detectable at surrounding land uses, including the nearest sensitive receptor. No long-term increase in groundborne vibration generation will occur following Project construction. For these reasons, the Project will not result in generation of excessive groundborne vibration. There will be 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 Area is located along the eastern boundary of the Travis Air Force Base Airport Influence Area covered by the Travis Land Use Compatibility Plan (Solano County 2008). However, the Project Area is approximately 7 miles from Travis Air Force Base's nearest facilities (i.e., runway) where excessive noise would be most likely due to the higher concentration of planes and associated equipment. This noise would be imperceptible from a distance of 7 miles, and flights over the Project Area would be infrequent and brief in duration. Project construction workers will therefore not be exposed to excessive noise from operations at Travis Air Force Base. The Project will 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 in a rural area of Solano County with low population density. Land surrounding the Project Area is primarily agricultural with a few domestic residences, including in the southeastern portion of Hastings Tract.

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 Project improves infrastructure along Hastings Cut, it does not include any elements that would induce population growth. There will be no impact.

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

The Project will not displace any existing housing or necessitate the construction of replacement housing elsewhere. There will be no impact.

2.15 Public Services

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
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?	☐	☐	☐	✓

2.15.1 Environmental setting

Hastings Tract is managed primarily for agriculture and private recreation at Hastings Island Hunting Preserve. There are no government facilities, public resources, or services on the tract.

2.15.2 Findings

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

Fire protection?

Police protection?

Schools?
Parks?
Other public facilities?

The Project will not affect fire protection services, police protection services, schools, parks, or other public facilities. None of these services have facilities on Hastings Tract, and access routes will be maintained to allow fire and police protection services to reach the residents and structures on Hastings Tract. There will be 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 Hastings Tract are a recreational resource for boating, fishing, wildlife viewing, and hunting. Lindsey Slough can be accessed via a boat ramp located within the Project Area; however, public access to the boat ramp is limited by locked gates along Hastings Cut Road.

On the interior of Hastings Tract, the privately owned Hastings Island Hunting Preserve includes approximately 4,700 acres that are maintained for recreational upland bird (e.g., ring-necked pheasant [*Phasianus colchicus*], chukar [*Alectoris chukar*]) hunting.

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 will not alter the use of existing neighborhood or regional parks or of the private hunting preserve on Hastings Tract. There will be no impact.

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

The Project does not require construction or expansion of recreational facilities which might have an adverse physical effect on the environment. There will be 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 113, Hastings Road, and Hastings Cut Road. Construction workers commuting to the Project Area, and Project haul trucks, will drive along approximately 5.5 miles of Hastings Road and Hastings Cut Road before joining State Route 113. The Project will temporarily increase traffic in the Project vicinity during construction but will not result in long-term changes to any traffic or transportation circulation system.

Hastings Tract has roads along existing levee crowns. The roads on levees in the Project Area that need to be excavated will be restored following Project construction.

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?

The Project will not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. There will be no impact.

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

Automobile vehicle miles traveled are not expected to change due to the Project since there will be no detours during construction or change to any transportation system. There will 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 Project will not affect the design or use of roads in the vicinity. There will be no impact.

d) Would the Project result in inadequate emergency access?

Emergency services will continue to have access to Hastings Tract via Hastings Road and Hastings Cut Road throughout Project construction. Project personnel, including haul truck drivers and equipment operators, will comply with local fire, police, and medical responders during any emergency. There will be no impact.

2.18 Tribal 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 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.	☐	☐	☐	✓

2.18.1 Environmental setting

2.18.1.1 Ethnographic overview

The Project Area is located within the ethnographic territory of the Southern Wintun or Patwin, who are members of the widespread Penutian language family (Johnson 1978). Patwin are the southernmost division of Wintuan groups. They occupied the southwest portion of the Sacramento Valley, from the lower hills of the eastern North Coast Ranges to the Sacramento River, and from Princeton south to San Pablo and Suisun bays. Patwin are comprised of numerous different tribal groups with separate dialects, but anthropologists usually separate Patwin into two primary subdivisions: Hill Patwin and River Patwin. Hill Patwin occupied the lower, eastern slopes of the southern North Coast Range, and River Patwin occupied the west side of the lower Sacramento River below the mouth of the Feather River and the lower reaches of Cache Creek and Putah Creek in the Sacramento Valley.

Patwin were organized into tribelets, which were usually composed of a principal village and a few satellite settlements (Kroeber 1932). Tribelets were small, autonomous, and sometimes bounded by the limits of a small drainage. Patwin subsistence relied on hunting, fishing, and gathering a wide variety of plant resources that were located within their territory, including acorns, blackberries, elderberries, grapes, tule, honey, salt (acquired from burning salt grass), and tobacco. Patwin also manufactured a variety of utilitarian and luxury items like baskets, stone tools, shell beads, and clothing.

River Patwin villages were estimated to average about 500 persons at Euroamerican contact (Cook 1976), which occurred by at least 1800 (Johnson 1978), and the Sacramento River Valley had an overall population density of approximately 3.35 persons per square mile. The influx of European and Spanish explorers and settlers during the 1830s and 1840s rapidly changed Patwin demography, as local Native American populations were used as labor on large land grants known as ranchos. Ranchos in the Project Area include Suisun and Tolenas (Beck and Haase 1974). The 1848 discovery of gold in the western Sierra Nevada foothills and the ensuing Gold Rush led to a flood of non-indigenous peoples into Patwin territory. The latter half of the nineteenth and early twentieth century witnessed ongoing and growing immigration of Euroamericans into the Project region, which was accompanied by regional cultural and economic changes highlighted by agricultural development of the Project Area.

2.18.1.2 Sacred Lands File search and Native American outreach

The NAHC returned the results of a SLF records search on November 28, 2022. The SLF results were negative for Native American resources in the vicinity of the Project (Natural Investigations Company 2023).

The Natural Investigations Company sent Project information letters to all tribal members or organizations affiliated with the region, as provided by NAHC, on November 28, 2022 (Natural Investigations Company 2023). If no response was received, follow-up phone calls were made on December 13, 2022. To date, no additional information has been received that indicates the potential presence of tribal cultural resources in the Project Area. However, one Tribe has reached out to initiate formal consultation with the District for the Project.

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?**

Native American outreach, SLF records, and the Natural Investigations Company survey indicate that there are no tribal cultural resources listed or eligible for listing in the CRHR or in a local register of historical resources within or near the Project Area (Natural Investigations Company 2023). The Project will have 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.**

Native American outreach, SLF records, and the Natural Investigations Company survey indicate that there are no significant tribal cultural resources within or near the Project Area (Natural Investigations Company 2023). The Project will have no impact.

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?	☐	☐	✓	☐

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
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 Hastings Tract. Wastewater is managed by private septic systems. Solid waste can be disposed of at landfills and recycling facilities in nearby cities (e.g., Vacaville, Dixon). Pacific Gas and Electric Company provides electricity to Hastings Tract via local distribution lines.

The California State Legislature passed the Integrated Waste Management Act of 1989 (AB 939; Section 6.2) to minimize the disposal of solid wastes. AB 939 established the California Integrated Waste Management Board (CIWMB) and required diversion of 25 percent of solid waste by 1995 and 50 percent by 2000. CIWMB's responsibilities transferred to the California Department of Resources Recycling and Recovery in 2010, and AB 341 (Section 6.2) was enacted in 2011, updating the statewide goal to 75 percent reduction by 2020. The Solano County Integrated Waste Management Plan outlines the ways in which Solano County will meet these goals (Solano County 2023).

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 will not impact any existing, or require construction of any new, utility infrastructure, including that relating to wastewater, electricity, natural gas, or telecommunications. There will 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 will not create a need for an increased water supply following construction. During construction, water trucks may source water from Cache Slough, Lindsey Slough, and/or Hastings Cut. Based on the relatively small amount of water needed temporarily during construction, sufficient water supplies will be available for these needs. There will 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 will not generate wastewater or require the use of a wastewater treatment facility. There will 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?

To the extent possible, fill removed during the levee excavation will be used as backfill during levee replacement. Any existing pipe features that cannot be removed or can remain in their current location without negatively impacting the surrounding environment will be abandoned in place. Any remaining materials not suitable for use in Project construction, including plant material or any trash generated during construction activities, will be recycled if possible, or disposed of at an off-site waste facility (likely Hay Road landfill). Because the Project will reuse or recycle materials where feasible and will only generate solid waste over the short term during Project construction, the Project will not 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. The impact will 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 (d) above, the Project will comply with federal, state, and local management and reduction statutes and regulations related to solid waste by reusing or recycling materials when possible. There will 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?	☐	☐	☐	✓

Issues	Potentially significant impact	Less than significant with mitigation incorporated	Less than significant impact	No impact
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 Solano County, the highest wildfire risk is in the western portion of the county where foothill or mountain areas have potentially large fuel loads. The Project Area, however, has generally flat topography and primarily includes agricultural land surrounded by waterways. The Project Area is in an unzoned state responsibility area and does not contain lands classified as moderate, high, or very high fire hazard severity zones (CalFire 2022).

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 in or near a state responsibility area or on land classified as a very high fire hazard severity zone. There will 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 in 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 will exacerbate wildfire risk. There will 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 in 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 will 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 in or near a state responsibility area or on land classified as a very high fire hazard severity zone. The topography in the Project Area is generally flat, and Project implementation will not result in increased runoff or slope instability. There will 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 Sections 2.4 and 2.10, the Project has the potential to impact special-status plant, fish, and wildlife species as well as their habitats within the Project Area. Impacts on these resources will be limited to a less than significant level with the incorporation of mitigation measures **MM-1** through **MM-13**.

Therefore, the Project will 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. Potential impacts on biological and cultural resources will 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 cultural resources, land use and planning, mineral resources, population and housing, public services, recreation, transportation, tribal cultural resources, and wildfire. As such, there is no potential for cumulatively considerable impacts on these resources.

The Project has been determined to have the potential for less-than-significant impacts to aesthetics, agriculture, air quality, energy, geology and soils, GHG emissions, hazards and hazardous materials, hydrology and water quality, noise, and utilities and service systems temporarily during construction. There are no other construction projects planned for 2025 on Hastings Tract that also have the potential to contribute to impacts to these resources. Additionally, the Project does not exceed the air quality and GHG thresholds that were determined by YSAQMD in consideration of the potential for cumulative effects attributable to emissions from multiple projects occurring simultaneously. The potential for cumulatively considerable hydrology and water quality impacts would be minimized by implementation of a SWPPP during construction (**CM-3** through **CM-6**); any nearby projects with the potential to impact surrounding waterways would also implement a SWPPP, as required by Clean Water Act Section 402. For these reasons, the Project will not have a cumulatively considerable impact on aesthetics, air quality, energy, geology and soils, GHG emissions, hazards and hazardous materials, hydrology and water quality, noise, or utilities and service systems.

In addition, and as described in (a) above, implementation of mitigation measures (**MM-1** through **MM-13**) during construction (e.g., preconstruction surveys) will prevent impacts to biological resources that have the potential to be cumulatively considerable.

For the reasons described above, the Project will not have environmental effects that are individually limited but cumulatively considerable; cumulative effects will 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 measures that are incorporated into its design, will 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 effects will not cause substantial adverse effects on humans, either directly or indirectly; impacts will 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
Mike Kynett	Supervising Engineer	MBK Engineers	Engineering, Project design
Catlin Ames	Fish Biologist	Stillwater Sciences	Environmental analysis (biological resources—fish)
Emily Applequist	Terrestrial Ecologist	Stillwater Sciences	Environmental analysis, document preparation
Carina Bilodeau	Botanist	Stillwater Sciences	Environmental analysis (biological resources—plants)
Joelle CantoAdams	Botanist	Stillwater Sciences	Environmental analysis, document preparation
Holly Burger	Senior Wildlife Biologist	Stillwater Sciences	Environmental analysis oversight
Megan Keever	Senior Botanist	Stillwater Sciences	Environmental analysis oversight (biological resources—plants)
AJ Keith	Senior Aquatic Ecologist	Stillwater Sciences	Environmental analysis oversight (biological resources—fish)
Marissa Montjoy	Biologist	Stillwater Sciences	Environmental analysis, document preparation
Joey Verdian	Geologist	Stillwater Sciences	Environmental analysis, document preparation
Cooper Walton	Biologist	Stillwater Sciences	Environmental analysis (biological resources—wildlife)
Andrew Dang, BA	Archaeologist	Natural Investigations Company	Cultural resources, tribal cultural resources
John Nadolski, MA	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 30-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 Solano County Clerk.
- The proposed IS/MND, NOI, and Notice of Completion (NOC) were electronically submitted to the State Clearinghouse 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 MBK Engineers offices in Sacramento.

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 USEPA's general conformity *de minimis* threshold, or hinder the attainment of air quality objectives in the local air basin. The Project will 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 a permit be obtained from USACE for fill of waters of the U.S., including wetlands, prior to Project implementation. 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 RWQCB. Section 404 and 401 permits will be secured prior to Project implementation, in compliance with this act.

Endangered Species Act. The Endangered Species Act (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 will ensure compliance with the ESA.

Migratory Bird Treaty Act. Protection of migratory birds, their occupied nests, and their eggs is required by the Migratory Bird Treaty Act (MBTA) (16 USC 703 et seq.), Title 50 Code of Federal Regulations (part 10), and CDFG Code Sections 3503 and 3513. The full list of the species protected under the MBTA appears in Title 50, Section 10.13, of the Code of Federal Regulations (50 CFR 10.13) and includes federally and state-listed migratory birds as well as other non-listed migratory birds. Mitigation measures incorporated into the Project will ensure compliance with the MBTA.

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. Lindsey Slough, Cache Slough, and Hastings Cut are considered navigable waters 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 levees. If it is determined that the Project may impact navigable waters or a USACE levee, then Section 10 and/or Section 408 permits will be secured, as necessary, prior to Project implementation.

6.2 State

Assembly Bills 32 and 1279. AB 32 required CARB 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 million metric tons of CO₂e) (CARB 2021) were below the 2020 GHG

emissions limit (431 million metric tons of CO₂e) (CARB 2018). Signed into law in 2022, AB 1279 expanded upon AB 32 by specifying an emissions limit which further requires California to reduce statewide GHG emissions to 85 percent below 1990s level by 2045. Emissions associated with Project construction will be temporary and will 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 NAHC, were contacted for information on the potential for indigenous resources in 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 percent reduction in solid waste disposal to a 75 percent reduction by 2020. The Project will reuse or recycle materials where feasible and will only generate solid waste over the short term during Project construction so will not impair the attainment of solid waste reduction goals.

California Environmental Quality Act. This Initial Study/Mitigated Negative Declaration has been prepared to comply with CEQA.

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

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 which have the potential to impact agriculture, wildlife habitat, and recreational uses. Pursuant to the Delta Protection 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 will not result in urban or suburban encroachment and is, therefore, 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 is determined that the Project is a covered action, a consistency determination will be obtained from the Delta Stewardship Council.

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 includes work on the waterside levee below the hinge point or waterside crest, the District is required to notify CDFW. If CDFW determines that the Project will have potential adverse effects on fish and wildlife resources, they will issue a Lake and Streambed Alteration Agreement that includes conditions to protect these resources. The Project will therefore comply with this Fish and Game Code section.

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 Fish and Game Code Section 3503 it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as otherwise provided. Fish and Game Code Section 3503.5 protects all birds-of-prey (raptors) and their eggs and nests, and under Section 3513 it is unlawful to take or possess any migratory non-game bird designated under the MBTA. Mitigation measures incorporated into the Project will ensure compliance with these Fish and Game Code sections.

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 will ensure compliance with these sections.

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

Native Plant Protection Act. The NPPA 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 NPPA were subsumed by CESA, but there is a subset of species, subspecies, and varieties of plants that were not and are protected as rare under the NPPA. Mitigation measures incorporated into the Project, which include NPPA rare plants that may be impacted, will ensure compliance with NPPA.

Porter-Cologne Water Quality Control Act. The Porter-Cologne Water Quality Control Act was established to protect water quality and beneficial uses of water in California. This act requires that National Pollutant Discharge Elimination System (NPDES) and Waste Discharge Requirement (WDR) permits for point and nonpoint source discharges, respectively, be obtained from the RWQCB to protect water quality in surface waters, groundwater, and wetlands. If it is determined that the Project may impact waters of the United States, then NPDES and WDR permits will be secured prior to Project implementation, in compliance with this act.

Surface Mining and Reclamation Act. SMARA 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 Hastings Tract has been classified into mineral resource zones, so the Project will not conflict with the policies in this act.

Warren-Alquist Act. The Warren-Alquist 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 will only utilize fossil fuels on a short-term basis during construction activities and will

include BMPs for energy conservation (e.g., limiting idling time, properly maintaining equipment).

Williamson Act (also known as the California Land Conservation Act). The Williamson 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 in the Project Area will not change over the long term following Project construction.

7 REFERENCES

- Aagaard, B. T., J. L. Blair, J. Boatwright, S. H. Garcia, R. A. Harris, A. J. Michael, D. P. Schwartz, and J. S. DiLeo. 2016. Earthquake outlook for the San Francisco Bay region 2014–2043 (ver. 1.1, August 2016): U.S. Geological Survey Fact Sheet 2016–3020. Available at: <http://dx.doi.org/10.3133/fs20163020>.
- Atwater, B. F. 1982a. Geologic maps of the Sacramento-San Joaquin Delta, California. Miscellaneous field studies map MF-1401. Bouldin Island quadrangle. Scale 1:24,000. Available at: https://ngmdb.usgs.gov/Prodesc/proddesc_7126.htm.
- Atwater, B. F. 1982b. Geologic Maps of the Sacramento-San Joaquin Delta, California. Report to accompany Map MF-1401. Available at: <https://pubs.usgs.gov/mf/1401/report.pdf>.
- Beck, W. A., and Y. D. Haase. 1974. Historical atlas of California, 1st edition. University of Oklahoma Press, Norman, Oklahoma.
- Bennett, W. A. 2005. Critical assessment of the delta smelt population in the San Francisco Estuary, California. San Francisco Estuary and Watershed Science [online serial] Volume 3. Available at: <http://repositories.cdlib.org/jmie/sfews/vol3/iss2/art1/>.
- Bryant, W. A., and S. E. Cluett, compilers. 2002a. Fault number 53b, Greenville fault zone, Marsh Creek-Greenville section. Quaternary fault and fold database of the United States: U.S. Geological Survey website. Available at: <https://earthquake.usgs.gov/static/lfs/nshm/qfaults/Reports/53b.pdf>.
- Bryant, W. A., and S. E. Cluett, compilers. 2002b. Fault number 37, Green Valley fault, in Quaternary fault and fold database of the United States: U.S. Geological Survey website. Available at: https://earthquake.usgs.gov/cfusion/qfault/show_report_AB_archive.cfm?fault_id=37§ion_id=.
- CalFire (California Department of Forestry and Fire Protection). 2022. California Fire Hazard Severity Zones (FHSZ). Available at: <https://www.arcgis.com/home/item.html?id=31219c833eb54598ba83d09fa0adb346>.
- California DOC (Department of Conservation). 2021. EQ Zapp: California earthquake hazards zone application. Available at: <https://www.conservation.ca.gov/cgs/geohazards/eq-zapp..>
- California DOC. 2022. California important farmland finder. California Department of Conservation, Division of Land Resources Protection, Farmland Mapping and Monitoring Program. Available at: <https://maps.conservation.ca.gov/DLRP/CIFF/>.
- California DOC. 2023a. Important farmland categories. Available at: <https://www.conservation.ca.gov/dlrp/fmmp/Pages/Important-Farmland-Categories.aspx>.
- California DOC. 2023b. California tsunami maps. Available at: <https://www.conservation.ca.gov/cgs/tsunami/maps>.

Cal-IPC (California Invasive Plant Council). 2023. California Invasive Plant Inventory. Online database. <https://www.cal-ipc.org/plants/inventory> [Accessed August 2023]. Prepared by California Invasive Plant Council, Berkeley, California.

Caltrans (California Department of Transportation). 2015. Technical Guidance Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. Report No. CTHWANP-RT-15-306.01.01.

CARB (California Air Resources Board). 2018. AB 32 Scoping Plan. Available at: <https://ww3.arb.ca.gov/cc/scopingplan/scopingplan.htm>.

CARB. 2019. California greenhouse gas emission inventory: 2000–2017, 2019 edition. Available at: https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2016/ghg_inventory_trends_00-16.pdf?_ga=2.41074274.1903261348.1588278400-1589787952.1543448564.

CARB. 2021. California greenhouse gas emissions for 2000 to 2019. Trends of Emissions and Other Indicators. Sacramento, California.

CARB. 2022. California greenhouse gas emissions for 2000 to 2020. Trends of Emissions and other indicators. Sacramento, California.

CARB. 2023a. Air quality standards. Available at: <https://ww2.arb.ca.gov/resources/background-air-quality-standards>.

CARB. 2023b. State area designations describing summary statistics for pollutants. Available at: <https://www.arb.ca.gov/adam/trends/trends1.php>.

CARB. 2023c. Summaries of historical area designations for state standards. Available at: <https://ww2.arb.ca.gov/our-work/programs/state-and-federal-area-designations/state-area-designations/summary-tables>.

Cavallo, B., R. Kurth, J. Kindopp, A. Seesholtz and M. Perrone. 2003. Distribution and habitat use of steelhead and other fishes in the lower Feather River, 1999–2001. Interim Report SP-F10, Task 3a. Prepared for California Department of Water Resources, Division of Environmental Services, Sacramento, California.

CDC (Centers for Disease Control and Prevention). 2022. What noises cause hearing loss? Available at: https://www.cdc.gov/ncchd/hearing_loss/what_noises_cause_hearing_loss.html.

CDFG (California Department of Fish and Game). 1983. Sacramento River and tributaries bank protection and erosion control investigation--evaluation of impacts on fisheries. Final Report. CDFG, Bay-Delta Fishery Project.

CDFW (California Department of Fish and Wildlife). 2012. Staff Report on Burrowing Owl Mitigation. State of California Natural Resources Agency, Department of Fish and Game. March 7, 2012.

CDFW. 2018. Protocols for surveying and evaluating impacts to special status native plant populations and sensitive natural communities. California Natural Resources Agency, Sacramento, California. Available at: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18959&inline>.

CDFW. 2023a. California Natural Diversity Database (CNDDDB), Rarefind version 5. CDFW, Sacramento, California. Available at: <https://www.wildlife.ca.gov/data/cnddb/maps-and-data>.

CDFW. 2023b. Unprocessed Data from CNDDDB Online Field Survey Form [ds1002]. California Department of Fish and Wildlife. Biogeographic Information and Observation System (BIOS). Available at: <http://bios.dfg.ca.gov>.

CDFW. 2023c. List of California Sensitive Natural Communities. Vegetation Classification and Mapping Program, California Department of Fish and Game, Sacramento, California. Available at: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=153609&inline>.

CDTSC (California Department of Toxic Substances Control). 2023. EnviroStor online map viewer database. <http://www.envirostor.dtsc.ca.gov/> [Accessed July 2023].

CEC (California Energy Commission). 2021. California Energy Commission: about. Website. <https://www.energy.ca.gov/about> [Accessed July 2021].

Central Valley RWQCB (Regional Water Quality Control Board). 2019. The Water Quality Control Plan (Basin Plan) for the Central Valley Region. Fifth edition.

CGS (California Geological Survey). 2010. Fault activity map of California. Compilation and interpretation by C. W. Jennings and W. A. Bryant with assistance from G. Saucedo.t: <https://maps.conservation.ca.gov/cgs/fam/App/> [Accessed August 2023].

CGS. 2018. Special Publication 42. Earthquake fault zones: A guide for government agencies, property owners/developers, and geoscience practitioners for assessing fault rupture hazards in California.at: https://www.conservation.ca.gov/cgs/Documents/Publications/Special-Publications/SP_042.pdf [Accessed August 2023].

CGS. 2022. MapService of the Alquist-Priolo Fault Zones defined under the Alquist-Priolo Earthquake Fault Zoning Act.at: <https://gis.conservation.ca.gov/portal/home/item.html?id=c280aad6034449e085023ef4f8d7e2ad> [Accessed August 2023].

CNPS (California Native Plant Society). 2023a. Inventory of rare and endangered plants of California (online edition, v8-03 0.39). Rare Plant Program, California Native Plant Society, Sacramento, California. [Accessed April and July 2023].

CNPS. 2023b. A Manual of California Vegetation, Online Edition. California Native Plant Society, Sacramento, CA. Available at: <http://www.cnps.org/cnps/vegetation/> [Accessed April 2023].

Cook, S. F. 1976. The Population of the California Indians, 1769–1970. University of California Press, Berkeley, California.

Delta Stewardship Council. 2019. Delta Plan. Available at: <https://deltacouncil.ca.gov/delta-plan/>.

DPC (Delta Protection Commission). 2010. Land Use and Resource Management Plan. Available at: http://delta.ca.gov/wp-content/uploads/2016/10/Land-Use-and-Resource-Management-Plan-2.25.10_.pdf.

Drexler, J. Z, C. S. de Fontaine, and T. A. Brown. 2009. Peat accretion histories during the past 6000 years in marshes of the Sacramento-San Joaquin Delta, California, USA. *Estuaries and Coasts* 32: 871–892.

DWR (California Department of Water Resources. 2023. Electrical conductivity data from Liberty Island station (Station ID: LIB). California Data Exchange Center, DWR, Sacramento, California. Available at: <http://cdec.water.ca.gov> [Accessed September 2023].

eBird. 2023. An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: <http://www.ebird.org>. [Accessed: February 2023].

FEMA (Federal Emergency Management Agency). 2023. FEMA Flood Map Service Center.at: <https://msc.fema.gov/portal/home>.

FGDC (Federal Geographic Data Committee). 2013. Classification of wetlands and deepwater habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, D.C.

FHWA (Federal Highway Administration). 1983. Visual impact assessment for highway projects. Washington, D.C.

FHWA. 2017. Construction noise handbook. Construction equipment noise levels and ranges. Available at: https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm.

FTA (Federal Transit Administration). 2018. Transit noise and vibration impact assessment manual. FTA Report No. 0123. Prepared by John A. Volpe National Transportation Systems Center. September.

Helley, E. J., and R. W. Graymer. 1997. Quaternary geology of Contra Costa County, and surrounding parts of Alameda, Marin, Sonoma, Solano, Sacramento, and San Joaquin Counties, California: A digital database. U.S. Geological Survey Open-File Report 97-98. Available at: <http://pubs.usgs.gov/of/1997/of97-098/>.

iNaturalist. 2023. Available from <https://www.inaturalist.org>. Accessed June 2023.

Johnson, P. J. 1978. Patwin. Pages 385–415 *in* California: Handbook of North American Indians, Volume 8. Smithsonian Institute. Plenum Press, New York.

Kroeber, A. L. 1932. The Patwin and their neighbors. University of California Publications in Archaeology and Ethnology 29: 253–423.

Lewis, E.L. 1980. The Practical Salinity Scale 1978 and its antecedents. *IEEE Journal of Oceanic Engineering* OE-5(1).

Merz J. E., Hamilton S., Bergman P. S, Cavallo B. 2011. Spatial perspective for delta smelt: a summary of contemporary survey data. *Calif Fish Game* 97:164–189.

MHM. 2023. Solano County, California Reclamation District No. 2060 Hastings Tract - Pipe Replacement Project. Volume 2. May.

Michny, F., and R. Deibel. 1986. Sacramento River, Chico Landing to Red Bluff Project, 1985 juvenile salmon study. Draft report. Prepared by U. S. Fish and Wildlife Service, Sacramento, California for U. S. Army Corps of Engineers, Sacramento, California.

Moyle, P. B. 2002. Inland Fishes of California. University of California Press, Berkeley.

Moyle P. B., R. D. Baxter, T. Sommer, T. C. Foin, and S. A. Matern. 2004. Biology and population dynamics of Sacramento splittail (*Pogonichthys macrolepidotus*) in the San Francisco Estuary: A review. San Francisco Estuary and Watershed Science [online serial] 2: Article 3.

Natural Investigations Company. 2023. Cultural resources assessment for the Reclamation District No. 2060: Hastings Tract Deferred Maintenance Program Pipe Replacement Project, Solano County, California. Prepared by Natural Investigations Company, Sacramento, California.

NMFS (National Marine Fisheries Service). 2009. Final biological and conference opinion on the long-term operations of the Central Valley Project and State Water Project. National Marine Fisheries Service, Southwest Region. Long Beach, California.

NMFS. 2016. National Marine Fisheries Service's West Coast Region California Species List Tools http://www.westcoast.fisheries.noaa.gov/maps_data/california_species_list_tools.html [Accessed April 2023].

NRCS (U.S. Department of Agriculture, Natural Resources Conservation Service). 2024. Web soil survey. Online database. Natural Resource Conservation Service. Available at: <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>.

PRISM Climate Group. 2023. Time Series Values for Individual Locations. PRISM Climate Group, Oregon State University, Corvallis, OR. Available at: <http://prism.oregonstate.edu/explorer/>.

Radtke, L. D. 1966. Distribution of smelt, juvenile sturgeon, and starry flounder in the Sacramento-San Joaquin Delta with observations on food of sturgeon. California Fish and Game Bulletin 136: 115–126.

San Joaquin County. 1992. San Joaquin County General Plan 2010. Section III.A Seismic and Geological Hazards. Available at: https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/handouts-planning_GP-V3-III-A?grp=handouts-planning&obj=GP-V3-III-A [Accessed August 2023].

Solano Collaborative (City of Vacaville Groundwater Sustainability Agency [GSA], Northern Delta GSA, Sacramento County GSA, Solano GSA, Solano Irrigation District GSA). 2021. Solano Subbasin Groundwater Sustainability Plan.

Solano County. 2008. Solano County General Plan. Available at: https://www.solanocounty.com/depts/rm/planning/general_plan.asp [Accessed July 2023].

Solano County. 2011. Solano County Climate Action Plan. Prepared by AECOM. June.

Solano County. 2023. Countywide Integrated Waste Management Plan. Available at: https://www.solanocounty.com/depts/rm/planning/solano_county_recycling/ciwmp_planning_documents.asp.

Solano County Water Agency. 2012. Solano Multispecies Habitat Conservation Plan. Available at: <https://www.scwa2.com/solano-multispecies-habitat-conservation-plan/>.

Stillwater Sciences. 2009. Sacramento River Bank Protection Project fisheries monitoring report, 2007–2008. Final. Contract No. W91238-07-C-0002. Prepared by Stillwater Sciences, Berkeley, California for U.S. Army Corps of Engineers, Sacramento District, Sacramento, California.

SWRCB (State Water Resources Control Board). 2022. CA 2020–2022 Integrated Report. Available at: <https://gispublic.waterboards.ca.gov/portal/home/item.html?id=6cca2a3a1815465599201266373cbb7b>.

Swainson's Hawk Technical Advisory Committee. 2000. Swainson's Hawk Technical Advisory Committee's Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley. Available at <https://www.wildlife.ca.gov/Conservation/Survey-Protocols#377281284-birds>.

Unruh, J. R., and C. S. Hitchcock. 2009. Characterization of potential seismic sources in the Sacramento-San Joaquin Delta, California. Prepared by Fugro William Lettis & Associates, Inc. Walnut Creek, California for U.S. Geological Survey, National Earthquake Hazards Reduction Program. Available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfi/x/exhibits/docs/dd_jardins/DDJ-142_Unruh.pdf.

USACE (U.S. Army Corps of Engineers). 1987. Corps of Engineers wetlands delineation manual. Technical Report Y-87-1. USACE, Environmental Laboratory, Waterways Experiment Station, Vicksburg, Mississippi.

USACE. 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region. Version 2.0. Final Report ERDC/EL TR-08-28. Wetlands Regulatory Assistance Program, USACE, Engineer Research and Development Center, Environmental Laboratory, Vicksburg, Mississippi.

USACE. 2022a. National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams. Interim Version ERDC/CRREL TR-22-26. Cold Regions Research and Engineering Laboratory, U.S. Army Engineer Research and Development Center, Hanover, New Hampshire.

USACE. 2022b. Interim Draft Rapid Ordinary High Water Mark (OHWM) Identification Data Sheet. ENG FORM 6250. Cold Regions Research and Engineering Laboratory, U.S. Army Engineer Research and Development Center, Hanover, New Hampshire.

USACE. 2023. Navigable waterways in the Sacramento District. Available at: <https://www.spk.usace.army.mil/Missions/Regulatory/Jurisdiction/Navigable-Waters-of-the-US/>.

USDA NRCS (U.S. Department of Agriculture Natural Resources Conservation Service). 2023a. Web soil survey. Online database. <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>.

USDA NRCS. 2023b. Hydric soils lists for Solano County, California soil survey area. Available at: <https://www.nrcs.usda.gov/publications/query-by-ssa.html>.

USEIA (U. S. Energy Information Administration). 2023. Rankings: Total Energy Consumed per Capita, 2021 (million Btu). Available at: <https://www.eia.gov/state/rankings/?sid=US> [Accessed July 2023].

USEPA (U.S. Environmental Protection Agency). 2023. Nonattainment Areas for Criteria Pollutants (Green Book). Available at: <https://www.epa.gov/green-book> [Accessed July 2023].

USFWS (U.S. Fish and Wildlife Service). 1997. 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. Letter from USFWS to USACE on November 13, 1997.

USFWS. 2000. Guidelines for conducting and reporting botanical inventories for federally listed, proposed and candidate plants.

USFWS. 2004. Formal Programmatic Consultation on the Issuance of Section 10 and 404 Permits for Projects with Relatively Small Effects on the delta smelt (*Hypomesus transpacificus*) and its Critical Habitat. Service File Number: 1-1-04-F-0345. Sacramento Fish and Wildlife Office, Sacramento, California.

USFWS. 2017. Framework for assessing impacts to the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). U.S. Fish and Wildlife Service, Sacramento, California.

USFWS. 2021. Appending the Grand Island Levee Repair Project, Sacramento County, California (Corps file number: SPN-2020-00163) to the December 1, 2004, formal programmatic consultation on the issuance of Section 10 and 404 permits for projects with relatively small effects on the delta smelt (*Hypomesus transpacificus*) and its critical habitat (Service File Number: 1-1-04-F-0345).

USFWS. 2023a. Information for Planning and Consultation (IPaC): online project planning tool. <https://ecos.fws.gov/ipac/> [Accessed April 2023].

USFWS. 2023b. National Wetlands Inventory (NWI) wetlands and riparian polygon data. Geospatial wetlands data. USFWS, Arlington, Virginia. <http://www.fws.gov/wetlands/>.

USGS (U.S. Geological Survey). 2023. Hydrologic units from the watershed boundary dataset. Available at: <https://gispublic.waterboards.ca.gov/portal/home/item.html?id=b6c1bab9acc148e7ac726e33c43402ee>.

Whipple, A. A., R. M. Grossinger, D. Rankin, B. Stanford, and R. A. Askevold. 2012. Sacramento-San Joaquin Delta historical ecology investigation: exploring pattern and process. A report of SFEI-ASC's Historical Ecology Program, Publication #672. Prepared by San Francisco Estuary Institute-Aquatic Science Center, Richmond, California for California Department of Fish and Game and Ecosystem Restoration Program. Available at: <http://www.sfei.org/DeltaHEStudy>.

Young, Y. J., Martin Perales, K., Durand, J. R., Moyle, P. B. 2015. Fish Distribution in the Cache Slough Complex of the Sacramento-San Joaquin Delta during Drought. IEP Newsletter Volume 28, Number 3, 2015.

YSAQMD (Yolo-Solano Air Quality Management District). 2007. Handbook for assessing and mitigating air quality impacts.

YSAQMD. 2019. Air Quality Attainment Plan. Triennial Assessment and Plan Update.

Appendices

Appendix A

California Emissions Estimator Model Data Entry and Emissions Summary Sheets

Hastings Tract Pipe Replacement Custom Report

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 - 2.2. Construction Emissions by Year, Unmitigated
- 3. Construction Emissions Details
 - 3.1. Site preparation (2025) - Unmitigated
 - 3.3. Levee replacement (2025) - Unmitigated
 - 3.5. Levee excavation at Lindsey Slough (2025) - Unmitigated
 - 3.7. Levee excavation and pipe removal (2025) - Unmitigated
 - 3.9. Cofferdam installation (2025) - Unmitigated
 - 3.11. Pipe installation (2025) - Unmitigated

5. Activity Data

5.1. Construction Schedule

5.2. Off-Road Equipment

5.2.1. Unmitigated

5.3. Construction Vehicles

5.3.1. Unmitigated

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

5.6.2. Construction Earthmoving Control Strategies

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Hastings Tract Pipe Replacement
Construction Start Date	5/1/2025
Lead Agency	Reclamation District No. 2060
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	5.70
Precipitation (days)	2.20
Location	38.26382088718836, -121.77209240190933
County	Solano-Sacramento
City	Unincorporated
Air District	Yolo/Solano AQMD
Air Basin	Sacramento Valley
TAZ	878
EDFZ	4
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.18

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
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User Defined Linear	0.25	Mile	4.00	0.00	0.00	—	—	Tide gates through island perimeter levees
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1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

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

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.71	3.10	27.2	27.4	0.06	1.21	57.0	58.2	1.11	6.82	7.93	—	6,812	6,812	0.23	0.27	3.34	6,903
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.43	0.36	3.07	3.19	0.01	0.14	4.86	5.00	0.12	0.61	0.74	—	737	737	0.03	0.02	0.10	743
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.08	0.07	0.56	0.58	< 0.005	0.02	0.89	0.91	0.02	0.11	0.13	—	122	122	< 0.005	< 0.005	0.02	123
Exceeds (Daily Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	—	—	—	—	—	—	80.0	—	—	—	—	—	—	—	—	—	—
Unmit.	—	—	—	—	—	Yes	—	No	—	—	—	—	—	—	—	—	—	—
Exceeds (Average Daily)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Threshold	—	—	—	—	—	—	—	80.0	—	—	—	—	—	—	—	—	—	—
Unmit.	—	—	—	—	—	Yes	—	No	—	—	—	—	—	—	—	—	—	—
Exceeds (Annual)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	10.0	10.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	—	No	No	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

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

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	3.71	3.10	27.2	27.4	0.06	1.21	57.0	58.2	1.11	6.82	7.93	—	6,812	6,812	0.23	0.27	3.34	6,903
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.43	0.36	3.07	3.19	0.01	0.14	4.86	5.00	0.12	0.61	0.74	—	737	737	0.03	0.02	0.10	743
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.08	0.07	0.56	0.58	< 0.005	0.02	0.89	0.91	0.02	0.11	0.13	—	122	122	< 0.005	< 0.005	0.02	123

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	1.85	1.55	12.9	12.6	0.03	0.55	—	0.55	0.51	—	0.51	—	3,054	3,054	0.12	0.02	—	3,065
Dust From Material Movement	—	—	—	—	—	—	2.56	2.56	—	1.31	1.31	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.10	0.03	< 0.005	< 0.005	7.42	7.42	< 0.005	0.74	0.74	—	70.8	70.8	< 0.005	0.01	0.14	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.07	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	16.7	16.7	< 0.005	< 0.005	—	16.8
Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	0.39	0.39	< 0.005	< 0.005	< 0.005	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.77	2.77	< 0.005	< 0.005	—	2.78
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	0.06	0.06	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.02	0.40	0.00	0.00	10.7	10.7	0.00	1.08	1.08	—	91.6	91.6	< 0.005	< 0.005	0.35	—
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	—
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	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	0.46	0.46	< 0.005	< 0.005	< 0.005	—
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	—
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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	0.08	0.08	< 0.005	< 0.005	< 0.005	—
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	—
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	—

3.3. Levee replacement (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	3.63	3.05	25.4	26.6	0.05	1.18	—	1.18	1.08	—	1.08	—	5,273	5,273	0.21	0.04	—	5,291

Dust From Material Movement:	—	—	—	—	—	—	3.18	3.18	—	1.38	1.38	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.10	0.03	< 0.005	< 0.005	7.42	7.42	< 0.005	0.74	0.74	—	70.8	70.8	< 0.005	0.01	0.14	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.20	0.17	1.39	1.46	< 0.005	0.06	—	0.06	0.06	—	0.06	—	289	289	0.01	< 0.005	—	290
Dust From Material Movement:	—	—	—	—	—	—	0.17	0.17	—	0.08	0.08	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	0.40	0.40	< 0.005	0.04	0.04	—	3.88	3.88	< 0.005	< 0.005	< 0.005	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.03	0.25	0.27	< 0.005	0.01	—	0.01	0.01	—	0.01	—	47.8	47.8	< 0.005	< 0.005	—	48.0
Dust From Material Movement:	—	—	—	—	—	—	0.03	0.03	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.07	0.07	< 0.005	0.01	0.01	—	0.64	0.64	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.02	0.40	0.00	0.00	10.7	10.7	0.00	1.08	1.08	—	91.6	91.6	< 0.005	< 0.005	0.35	—
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	—
Hauling	0.05	0.03	1.62	0.38	0.01	0.03	35.7	35.7	0.03	3.62	3.65	—	1,377	1,377	0.01	0.22	2.85	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.58	0.58	0.00	0.06	0.06	—	4.62	4.62	< 0.005	< 0.005	0.01	—
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	—
Hauling	< 0.005	< 0.005	0.09	0.02	< 0.005	< 0.005	1.94	1.94	< 0.005	0.20	0.20	—	75.5	75.5	< 0.005	0.01	0.07	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	0.11	0.11	0.00	0.01	0.01	—	0.77	0.77	< 0.005	< 0.005	< 0.005	—
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	—
Hauling	< 0.005	< 0.005	0.02	< 0.005	< 0.005	< 0.005	0.35	0.35	< 0.005	0.04	0.04	—	12.5	12.5	< 0.005	< 0.005	0.01	—

3.5. Levee excavation at Lindsey Slough (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	3.59	3.01	25.2	26.4	0.05	1.17	—	1.17	1.08	—	1.08	—	5,239	5,239	0.21	0.04	—	5,256
Dust From Material Movement	—	—	—	—	—	—	3.18	3.18	—	1.38	1.38	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.10	0.03	< 0.005	< 0.005	7.42	7.42	< 0.005	0.74	0.74	—	70.8	70.8	< 0.005	0.01	0.14	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.04	0.35	0.36	< 0.005	0.02	—	0.02	0.01	—	0.01	—	71.8	71.8	< 0.005	< 0.005	—	72.0
Dust From Material Movement	—	—	—	—	—	—	0.04	0.04	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.10	0.10	< 0.005	0.01	0.01	—	0.97	0.97	< 0.005	< 0.005	< 0.005	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.06	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	11.9	11.9	< 0.005	< 0.005	—	11.9
Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	0.16	0.16	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.02	0.40	0.00	0.00	10.7	10.7	0.00	1.08	1.08	—	91.6	91.6	< 0.005	< 0.005	0.35	—
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	—
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	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	0.15	0.15	0.00	0.01	0.01	—	1.16	1.16	< 0.005	< 0.005	< 0.005	—
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	—

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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	0.03	0.03	0.00	< 0.005	< 0.005	—	0.19	0.19	< 0.005	< 0.005	< 0.005	—
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	—
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	—

3.7. Levee excavation and pipe removal (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	2.84	2.38	19.9	20.1	0.04	0.85	—	0.85	0.79	—	0.79	—	4,243	4,243	0.17	0.03	—	4,258
Dust From Material Movement	—	—	—	—	—	—	2.76	2.76	—	1.34	1.34	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.10	0.03	< 0.005	< 0.005	7.42	7.42	< 0.005	0.74	0.74	—	70.8	70.8	< 0.005	0.01	0.14	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.03	0.27	0.28	< 0.005	0.01	—	0.01	0.01	—	0.01	—	58.1	58.1	< 0.005	< 0.005	—	58.3
Dust From Material Movement	—	—	—	—	—	—	0.04	0.04	—	0.02	0.02	—	—	—	—	—	—	—

Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.10	0.10	< 0.005	0.01	0.01	—	0.97	0.97	< 0.005	< 0.005	< 0.005	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.05	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.62	9.62	< 0.005	< 0.005	—	9.66
Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	0.16	0.16	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.02	0.40	0.00	0.00	10.7	10.7	0.00	1.08	1.08	—	91.6	91.6	< 0.005	< 0.005	0.35	—
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	—
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	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	0.15	0.15	0.00	0.01	0.01	—	1.16	1.16	< 0.005	< 0.005	< 0.005	—
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	—
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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	0.03	0.03	0.00	< 0.005	< 0.005	—	0.19	0.19	< 0.005	< 0.005	< 0.005	—
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	—
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	—

3.9. Cofferdam installation (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	3.41	2.86	24.2	26.1	0.05	1.12	—	1.12	1.03	—	1.03	—	5,135	5,135	0.21	0.04	—	5,153
Dust From Material Movement	—	—	—	—	—	—	3.18	3.18	—	1.38	1.38	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.10	0.03	< 0.005	< 0.005	7.42	7.42	< 0.005	0.74	0.74	—	70.8	70.8	< 0.005	0.01	0.14	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.08	0.66	0.72	< 0.005	0.03	—	0.03	0.03	—	0.03	—	141	141	0.01	< 0.005	—	141
Dust From Material Movement	—	—	—	—	—	—	0.09	0.09	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.20	0.20	< 0.005	0.02	0.02	—	1.94	1.94	< 0.005	< 0.005	< 0.005	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.01	0.12	0.13	< 0.005	0.01	—	0.01	0.01	—	0.01	—	23.3	23.3	< 0.005	< 0.005	—	23.4

Dust From Material Movement	—	—	—	—	—	—	0.02	0.02	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	0.32	0.32	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.02	0.40	0.00	0.00	10.7	10.7	0.00	1.08	1.08	—	91.6	91.6	< 0.005	< 0.005	0.35	—
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	—
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	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	0.29	0.29	0.00	0.03	0.03	—	2.31	2.31	< 0.005	< 0.005	< 0.005	—
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	—
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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	0.38	0.38	< 0.005	< 0.005	< 0.005	—
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	—
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	—

3.11. Pipe installation (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	1.27	1.06	7.77	8.92	0.02	0.29	—	0.29	0.26	—	0.26	—	2,297	2,297	0.09	0.02	—	2,305
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.10	0.03	< 0.005	< 0.005	7.42	7.42	< 0.005	0.74	0.74	—	70.8	70.8	< 0.005	0.01	0.14	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.21	0.24	< 0.005	0.01	—	0.01	0.01	—	0.01	—	62.9	62.9	< 0.005	< 0.005	—	63.1
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.20	0.20	< 0.005	0.02	0.02	—	1.94	1.94	< 0.005	< 0.005	< 0.005	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.04	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	10.4	10.4	< 0.005	< 0.005	—	10.5
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	0.32	0.32	< 0.005	< 0.005	< 0.005	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.02	0.40	0.00	0.00	10.7	10.7	0.00	1.08	1.08	—	91.6	91.6	< 0.005	< 0.005	0.35	—
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	—
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	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	0.29	0.29	0.00	0.03	0.03	—	2.31	2.31	< 0.005	< 0.005	< 0.005	—
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	—
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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	0.38	0.38	< 0.005	< 0.005	< 0.005	—
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	—
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	—

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	5/7/2025	5/8/2025	6.00	2.00	site preparation at Cache and Lindsey sloughs
Levee replacement	Linear, Grading & Excavation	8/19/2025	9/11/2025	6.00	20.0	levee replacement at Cache and Lindsey sloughs
Levee excavation at Lindsey Slough	Linear, Grading & Excavation	9/12/2025	9/17/2025	6.00	5.00	levee excavation at Lindsey Slough

Levee excavation and pipe removal	Linear, Grading & Excavation	8/13/2025	8/17/2025	6.00	5.00	levee excavation at Cache Slough
Cofferdam installation	Linear, Grading & Excavation	8/1/2025	8/12/2025	5.00	10.0	cofferdam installations at Cache and Lindsey sloughs and Hastings Cut
Pipe installation	Linear, Drainage, Utilities, & Sub-Grade	9/18/2025	9/28/2025	6.00	10.0	Pipe installation at Lindsey slough

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	1.00	8.00	367	0.40
Site preparation	Rubber Tired Loaders	Diesel	Average	1.00	5.50	150	0.36
Site preparation	Off-Highway Trucks	Diesel	Average	1.00	8.00	376	0.38
Levee replacement	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Levee replacement	Graders	Diesel	Average	3.00	8.00	148	0.41
Levee replacement	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Levee replacement	Plate Compactors	Diesel	Average	1.00	8.00	8.00	0.43
Levee replacement	Pumps	Diesel	Average	1.00	24.0	11.0	0.74
Levee replacement	Aerial Lifts	Diesel	Average	1.00	5.00	46.0	0.31
Levee replacement	Rubber Tired Loaders	Diesel	Average	1.00	5.50	150	0.36
Levee replacement	Off-Highway Trucks	Diesel	Average	1.00	8.00	376	0.38
Levee excavation at Lindsey Slough	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Levee excavation at Lindsey Slough	Graders	Diesel	Average	3.00	8.00	148	0.41
Levee excavation at Lindsey Slough	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40

Levee excavation at Lindsey Slough	Pumps	Diesel	Average	1.00	24.0	11.0	0.74
Levee excavation at Lindsey Slough	Aerial Lifts	Diesel	Average	1.00	5.00	46.0	0.31
Levee excavation at Lindsey Slough	Rubber Tired Loaders	Diesel	Average	1.00	5.50	150	0.36
Levee excavation at Lindsey Slough	Off-Highway Trucks	Diesel	Average	1.00	8.00	376	0.38
Levee excavation and pipe removal	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Levee excavation and pipe removal	Graders	Diesel	Average	1.00	8.00	148	0.41
Levee excavation and pipe removal	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Levee excavation and pipe removal	Pumps	Diesel	Average	1.00	24.0	11.0	0.74
Levee excavation and pipe removal	Aerial Lifts	Diesel	Average	1.00	5.00	46.0	0.31
Levee excavation and pipe removal	Rubber Tired Loaders	Diesel	Average	1.00	5.50	150	0.36
Levee excavation and pipe removal	Off-Highway Trucks	Diesel	Average	1.00	8.00	376	0.38
Cofferdam installation	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Cofferdam installation	Graders	Diesel	Average	3.00	8.00	148	0.41
Cofferdam installation	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Cofferdam installation	Aerial Lifts	Diesel	Average	1.00	5.00	46.0	0.31
Cofferdam installation	Rubber Tired Loaders	Diesel	Average	1.00	5.50	150	0.36
Cofferdam installation	Off-Highway Trucks	Diesel	Average	1.00	8.00	376	0.38
Pipe installation	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Pipe installation	Pumps	Diesel	Average	1.00	24.0	11.0	0.74
Pipe installation	Aerial Lifts	Diesel	Average	1.00	5.00	46.0	0.31
Pipe installation	Rubber Tired Loaders	Diesel	Average	1.00	5.50	150	0.36

Pipe installation	Off-Highway Trucks	Diesel	Average	1.00	8.00	376	0.38
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5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Levee replacement	—	—	—	—
Levee replacement	Worker	6.00	20.0	LDA,LDT1,LDT2
Levee replacement	Vendor	0.00	8.40	HHDT,MHDT
Levee replacement	Hauling	20.0	20.0	HHDT
Levee replacement	Onsite truck	2.00	10.0	HHDT
Pipe installation	—	—	—	—
Pipe installation	Worker	6.00	20.0	LDA,LDT1,LDT2
Pipe installation	Vendor	0.00	8.40	HHDT,MHDT
Pipe installation	Hauling	0.00	20.0	HHDT
Pipe installation	Onsite truck	2.00	10.0	HHDT
Levee excavation at Lindsey Slough	—	—	—	—
Levee excavation at Lindsey Slough	Worker	6.00	20.0	LDA,LDT1,LDT2
Levee excavation at Lindsey Slough	Vendor	0.00	8.40	HHDT,MHDT
Levee excavation at Lindsey Slough	Hauling	0.00	20.0	HHDT
Levee excavation at Lindsey Slough	Onsite truck	2.00	10.0	HHDT
Site preparation	—	—	—	—
Site preparation	Worker	6.00	20.0	LDA,LDT1,LDT2
Site preparation	Vendor	0.00	8.40	HHDT,MHDT
Site preparation	Hauling	0.00	20.0	HHDT
Site preparation	Onsite truck	2.00	10.0	HHDT
Levee excavation and pipe removal	—	—	—	—

Levee excavation and pipe removal	Worker	6.00	20.0	LDA,LDT1,LDT2
Levee excavation and pipe removal	Vendor	0.00	8.40	HHDT,MHDT
Levee excavation and pipe removal	Hauling	0.00	20.0	HHDT
Levee excavation and pipe removal	Onsite truck	2.00	10.0	HHDT
Cofferdam installation	—	—	—	—
Cofferdam installation	Worker	6.00	20.0	LDA,LDT1,LDT2
Cofferdam installation	Vendor	0.00	8.40	HHDT,MHDT
Cofferdam installation	Hauling	0.00	20.0	HHDT
Cofferdam installation	Onsite truck	2.00	10.0	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

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

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site preparation	—	—	4.00	0.00	—
Levee replacement	2,150	—	4.00	0.00	—
Levee excavation at Lindsey Slough	—	—	4.00	0.00	—
Levee excavation and pipe removal	—	—	4.00	0.00	—
Cofferdam installation	—	—	4.00	0.00	—

Pipe installation	—	—	4.00	0.00	—
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5.6.2. Construction Earthmoving Control Strategies

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

Appendix B

Database Query Results for Special-status Plant Species and Sensitive Natural Communities in the Hastings Tract Pipe Replacement Project Region

Table B-1. Special-status plant species documented in the Project region.

Scientific name	Common name	Status ¹ CRPR/State/ Federal	Query source	Blooming period	Elevation range (feet)	Habitat associations	Potential to occur in the Project Area
<i>Astragalus tener</i> var. <i>ferrisiae</i>	Ferris' milk- vetch	1B.1/--	CNPS, CNDDB	April–May	5–245	Meadows and seeps and valley and foothill grassland	Yes; suitable habitat may be present
<i>Astragalus tener</i> var. <i>tener</i>	alkali milk- vetch	1B.2/--	CNPS, CNDDB	March–June	5–195	Alkaline areas in playas, valley and foothill grassland, vernal pools	No; suitable habitat not present
<i>Atriplex</i> <i>cordulata</i> var. <i>cordulata</i>	heartscale	1B.2/--	CNPS, CNDDB	April–October	0–1,835	Sometimes alkaline areas in chenopod scrub, meadows and seeps, and valley and foothill grassland	Yes; suitable habitat may be present
<i>Atriplex</i> <i>coronata</i> var. <i>coronata</i>	crownscale	4.2/--	CNPS	March–October	5–1,935	Alkaline and often clay areas in chenopod scrub, valley and foothill grassland, and vernal pools	No; suitable habitat not present
<i>Atriplex</i> <i>depressa</i>	brittlescale	1B.2/--	CNPS, CNDDB	April–October	5–1,050	Alkaline and clay areas in chenopod scrub, meadows and seeps, playas, valley and foothill grassland, and vernal pools	No; suitable habitat not present
<i>Atriplex</i> <i>persistens</i>	vernal pool smallscale	1B.2/--	CNPS, CNDDB	June–October	35–375	Vernal pools	No; suitable habitat not present
<i>Centromadia</i> <i>parryi</i> subsp. <i>parryi</i>	pappose tarplant	1B.2/--	CNPS, CNDDB	May–November	0–1,380	Often alkaline areas in chaparral, coastal prairie, marshes and swamps, meadows and seeps, and valley and foothill grassland	Yes; suitable habitat may be present
<i>Centromadia</i> <i>parryi</i> subsp. <i>rudis</i>	Parry's rough tarplant	4.2/--	CNPS	May–October	0–330	Alkaline and vernal mesic areas and sometimes roadsides in seeps, valley and foothill grassland, and vernal pools	Yes; suitable habitat may be present
<i>Chloropyron</i> <i>molle</i> subsp. <i>hispidum</i>	hispid salty bird's-beak	1B.1/--	CNPS, CNDDB	June–September	5–510	Alkaline areas in meadows and seeps, playas, and valley and foothill grassland	No; suitable habitat not present
<i>Chloropyron</i> <i>molle</i> subsp. <i>molle</i>	soft salty bird's-beak	1B.2/CR/FE	CNPS, CNDDB	June–November	0–10	Marshes and swamps	Yes; suitable habitat may be present

Scientific name	Common name	Status ¹ CRPR/State/ Federal	Query source	Blooming period	Elevation range (feet)	Habitat associations	Potential to occur in the Project Area
<i>Cicuta maculata</i> var. <i>bolanderi</i>	Bolander's water- hemlock	2B.1/--	CNPS, CNDDB	July–September	0–655	Marshes and swamps	Yes; suitable habitat may be present
<i>Cirsium hydrophilum</i> var. <i>hydrophilum</i>	Suisun thistle	1B.1/--FE	CNPS, CNDDB	June–September	0–5	Marshes and swamps	Yes; suitable habitat may be present
<i>Delphinium recurvatum</i>	recurved larkspur	1B.2/--	CNPS, CNDDB	March–June	10–2,590	Alkaline areas in chenopod scrub, cismontane woodland, and valley and foothill grassland	No; suitable habitat not present
<i>Downingia pusilla</i>	dwarf downingia	2B.2/--	CNPS, CNDDB	March–May	5–1,460	Valley and foothill grassland, and vernal pools	Yes; suitable habitat may be present
<i>Eleocharis parvula</i>	small spikerush	4.3/--	CNPS	(April) June– August (September)	5–9,910	Marshes and swamps	Yes; suitable habitat may be present
<i>Eryngium jepsonii</i>	Jepson's coyote-thistle	1B.2/--	CNPS, CNDDB	April–August	10–985	Clay areas in valley and foothill grassland, and vernal pools	Yes; suitable habitat may be present
<i>Extriplex joaquinana</i>	San Joaquin spearscale	1B.2/--	CNPS, CNDDB	April–October	5–2,740	Alkaline areas in chenopod scrub, meadows and seeps, playas, and valley and foothill grassland	No; suitable habitat not present
<i>Fritillaria agrestis</i>	stinkbells	4.2/--	CNPS	March–June	35–5,100	Clay, sometimes serpentinite areas in chaparral, cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland	Yes; suitable habitat may be present
<i>Fritillaria liliacea</i>	fragrant fritillary	1B.2/--	CNPS, CNDDB	February–April	10–1,345	Often serpentinite areas in cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland	Yes; suitable habitat may be present
<i>Fritillaria pluriflora</i>	adobe-lily	1B.2/--	CNPS, CNDDB	February–April	195– 2,315	Often adobe areas in chaparral, cismontane woodland, and valley and foothill grassland	Yes; suitable habitat may be present
<i>Gratiola heterosepala</i>	Boggs Lake hedge-hyssop	1B.2/CE/-	CNPS, CNDDB	April–August	35–7,790	Clay areas in marshes and swamps, and vernal pools	Yes; suitable habitat may be present
<i>Hesperevax caulescens</i>	hogwallow starfish	4.2/--	CNPS	March–June	0–1,655	Sometimes alkaline areas in valley and foothill grassland, vernal pools	Yes; suitable habitat may be present

Scientific name	Common name	Status ¹ CRPR/State/ Federal	Query source	Blooming period	Elevation range (feet)	Habitat associations	Potential to occur in the Project Area
<i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i>	woolly rose-mallow	1B.2/–/–	CNPS, CNDDDB	June–September	0–395	Marshes and swamps	Yes; suitable habitat may be present
<i>Isocoma arguta</i>	Carquinez goldenbush	1B.1/–/–	CNPS, CNDDDB	August–December	5–65	Valley and foothill grassland	Yes; suitable habitat may be present
<i>Lasthenia chrysantha</i>	alkali-sink goldfields	1B.1/–/–	CNPS, CNDDDB	February–April	0–655	Alkaline areas in vernal pools	No; suitable habitat not present
<i>Lasthenia conjugens</i>	Contra Costa goldfields	1B.1/–/FE	CNPS, CNDDDB	March–June	0–1,540	Mesic areas in cismontane woodland, playas, valley and foothill grassland, and vernal pools	Yes; suitable habitat may be present
<i>Lasthenia ferrisiae</i>	Ferris' goldfields	4.2/–/–	CNPS	February–May	65–2,295	Vernal pools	No; suitable habitat not present
<i>Lasthenia glabrata</i> subsp. <i>coulteri</i>	Coulter's goldfields	1B.1/–/–	CNPS, CNDDDB	February–June	5–4,005	Marshes and swamps, playas, and vernal pools	Yes; suitable habitat may be present
<i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	Delta tule pea	1B.2/–/–	CNPS, CNDDDB	May–July (August–September)	0–15	Marshes and swamps	Yes; suitable habitat may be present
<i>Legenere limosa</i>	legenere	1B.1/–/–	CNPS, CNDDDB	April–June	5–2,885	Vernal pools	No; suitable habitat not present
<i>Lepidium latipes</i> var. <i>heckardii</i>	Heckard's pepper-grass	1B.2/–/–	CNPS, CNDDDB	March–May	5–655	Valley and foothill grassland	Yes; suitable habitat may be present
<i>Lessingia hololeuca</i>	woolly-headed lessingia	3/–/–	CNPS	June–October	50–1,000	Clay and serpentinite areas in broadleaved upland forest, coastal scrub, lower montane coniferous forest, and valley and foothill grassland	No; suitable habitat not present
<i>Lilaeopsis masonii</i>	Mason's lilaeopsis	1B.1/CR/–	CNPS, CNDDDB	April–November	0–35	Marshes and swamps, and riparian scrub	Yes; suitable habitat may be present
<i>Limosella australis</i>	Delta mudwort	2B.1/–/–	CNPS, CNDDDB	May–August	0–10	Usually streambanks in marshes and swamps, and riparian scrub	Yes; suitable habitat may be present

Scientific name	Common name	Status ¹ CRPR/State/ Federal	Query source	Blooming period	Elevation range (feet)	Habitat associations	Potential to occur in the Project Area
<i>Meesia triquetra</i>	three-ranked hump moss	4.2/-/-	CNPS	July	4,265– 9,690	Bogs and fens, meadows and seeps, subalpine coniferous forest, and upper montane coniferous forest	No; suitable habitat not present
<i>Microseris paludosa</i>	marsh microseris	1B.2/-/-	CNPS, CNDDB	April–June (July)	15–1,165	Cismontane woodland, closed-cone coniferous forest, coastal scrub, and valley and foothill grassland	Yes; suitable habitat may be present
<i>Myosurus minimus</i> subsp. <i>apus</i>	little mousetail	3.1/-/-	CNPS	March–June	65–2,100	Valley and foothill grassland, and vernal pools	No; suitable habitat not present
<i>Navarretia leucocephala</i> subsp. <i>bakeri</i>	Baker's navarretia	1B.1/-/-	CNPS, CNDDB	April–July	15–5,710	Mesic areas in cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, and vernal pools	Yes; suitable habitat may be present
<i>Neostapfia colusana</i>	Colusa grass	1B.1/CE/FT	CNPS, CNDDB, USFWS	May–August	15–655	Vernal pools	No; suitable habitat not present
<i>Orcuttia inaequalis</i>	San Joaquin Valley Orcutt grass	1B.1/CE/FT	CNPS, CNDDB	April–September	35–2,475	Vernal pools	No; suitable habitat not present
<i>Perideridia gairdneri</i> subsp. <i>gairdneri</i>	Gairdner's yampah	4.2/-/-	CNPS	June–October	0–2,000	Vernally mesic areas in broadleafed upland forest, chaparral, coastal prairie, valley and foothill grassland, and vernal pools	Yes; suitable habitat may be present
<i>Plagiobothrys hystriculus</i>	bearded popcornflower	1B.1/-/-	CNPS, CNDDB	April–May	0–900	Valley and foothill grassland, vernal pools	Yes; suitable habitat may be present
<i>Puccinellia simplex</i>	California alkali grass	1B.2/-/-	CNPS, CNDDB	March–May	5–3,050	Alkaline areas, flats, lake margins, and vernally mesic areas in chenopod scrub, meadows and seeps, valley and foothill grassland, and vernal pools	Yes; suitable habitat may be present
<i>Sagittaria sanfordii</i>	Sanford's arrowhead	1B.2/-/-	CNPS, CNDDB	May– October(November)	0–2,135	Marshes and swamps	Yes; suitable habitat may be present

Scientific name	Common name	Status ¹ CRPR/State/ Federal	Query source	Blooming period	Elevation range (feet)	Habitat associations	Potential to occur in the Project Area
<i>Sidalcea keckii</i>	Keck's checkerbloom	1B.1/-/FE	CNPS, CNDDB, USFWS	April–May(June)	245– 2,135	Clay and serpentinite areas in cismontane woodland, and valley and foothill grassland	No; suitable habitat not present
<i>Spergularia macrotheca</i> var. <i>longistyla</i>	long-styled sand-spurrey	1B.2/-/-	CNPS	February–May	0–835	Alkaline areas in marshes and swamps, and meadows and seeps	No; suitable habitat not present
<i>Symphyotrichum lentum</i>	Suisun Marsh aster	1B.2/-/-	CNPS, CNDDB	(April)May– November	0–10	Marshes and swamps	Yes; suitable habitat may be present
<i>Trifolium amoenum</i>	two-fork clover	1B.1/-/FE	CNPS, CNDDB	April–June	15–1,360	Coastal bluff scrub, and valley and foothill grassland	Yes; suitable habitat may be present
<i>Trifolium hydrophilum</i>	saline clover	1B.2/-/-	CNPS, CNDDB	April–June	0–985	Marshes and swamps, valley and foothill grassland, and vernal pools	Yes; suitable habitat may be present
<i>Tuctoria mucronata</i>	Crampton's tuctoria or Solano grass	1B.1/CE/FE	CNPS, CNDDB, USFWS	April–August	15–35	Valley and foothill grassland, and vernal pools	Yes; suitable habitat may be present

¹ Status:**Federal**

- FE Federally listed as endangered
- FT Federally listed as threatened
- No federal status

State

- CE State listed as endangered
- CR State listed as rare
- No state status

California Rare Plant Rank (CRPR)

- 1A Plants presumed extirpated in California and rare or extinct elsewhere
- 1B Plants rare, threatened, or endangered in California and elsewhere
- 2B Plants rare, threatened, or endangered in California, but more common elsewhere
- 3 More information needed about this plant, a review list
- 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. CNDDDB query results for sensitive natural communities previously documented in the Project region.

Natural community (Holland 1986)	Status	Distribution ¹	Habitat description ¹	Potential sensitive vegetation alliances (state rank) ²	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)	• <i>Carex obnupta</i> – <i>Oenanth sarmentosa</i> – <i>Scirpus microcarpus</i> (S3) • <i>Deschampsia cespitosa</i> – <i>Hordeum brachyantherum</i> – <i>Danthonia californica</i> (S3) • <i>Hydrocotyle (ranunculoides, umbellata)</i> (S3?) • <i>Isoetes (bolanderi, echinospora, howellii, nuttallii, occidentalis)</i> (S3?) • <i>Nuphar lutea</i> (S3?) • <i>Schoenoplectus americanus</i> (S3.2) • <i>Scirpus microcarpus</i> (S2)	Yes, species and structure may be present
Coastal Brackish Marsh	S2.1	Usually at the interior edges of coastal bays and estuaries or in coastal lagoons. Adjacent to several Salt Marshes. Most extensively developed around Suisun Bay at the mouth of the Sacramento-San Joaquin Delta.	Brackish from freshwater input. Salinity may vary considerably and may increase at high tide or during seasons of low freshwater runoff or both.	• <i>Bolboschoenus maritimus</i> (S3) • <i>Carex lyngbyei</i> (S1) • <i>Carex obnupta</i> – <i>Oenanth sarmentosa</i> – <i>Scirpus microcarpus</i> (S3) • <i>Grindelia (stricta)</i> (S2S3) • <i>Ruppia (cirrhosa, maritima)</i> (S2) • <i>Stuckenia (pectinata)</i> – <i>Potamogeton</i> spp. (S3 ?)	Yes, species and structure may be present
Northern Claypan Vernal Pool	S1.1	Primarily on old alluvial terraces on the east side of the Great Valley from Tulare or Fresno County north to Shasta County	Old, circum-neutral to alkaline, Fe-Si cemented hardpan soils.	• <i>Centromadia (pungens)</i> (S2) • <i>Cressa truxillensis</i> – <i>Distichlis spicata</i> (S2) • <i>Eryngium aristulatum</i> (S2) • <i>Lasthenia fremontii</i> – <i>Distichlis spicata</i> (S2)	None, species and structure not present

Natural community (Holland 1986)	Status	Distribution¹	Habitat description¹	Potential sensitive vegetation alliances (state rank)²	Potential to occur in the Project Area
Valley Needlegrass Grassland	S3.1	Formerly extensive around the Sacramento, San Joaquin, and Salinas Valleys, as well as the Los Angeles Basin, but now much reduced.	Usually on fine-textured (often clay) soils, moist or even waterlogged during winter, but very dry in summer.	• <i>Nassella</i> spp. – <i>Melica</i> spp. (S3S4)	None, species and structure 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
S3 = Vulnerable: At moderate risk of extinction or elimination due to a restricted range, relatively few populations, recent declines, or other factors
S4 = Apparently Secure: At low risk of extinction or elimination, uncommon but not rare
0.1 = Very threatened
0.2 = Moderately threatened
? = Uncertain threat ranking

¹ Source: Holland (1986)

² Source: CNPS (2023b)

Appendix C

Database Query Results for Special-status Fish and Wildlife Species in the Hastings Tract Pipe Replacement Project Region

Table C-1. Special-status fish and wildlife species with potential to occur within the Hastings Project Area.

Common name Scientific name	Query Sources	Status ^a Federal/ State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
Invertebrates					
Conservancy fairy shrimp <i>Branchinecta conservatio</i>	USFWS, CDFW	FE/–	Vernal pools in the Central Valley from Tehama County to Merced County. A single population in the interior Coast Ranges near Santa Barbara	Large, deep vernal pools in annual grasslands	None; the Project Area does not contain suitable or critical habitat (USFWS 2006)
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	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; the Project Area does not contain suitable or critical habitat (USFWS 2006)
Vernal pool tadpole shrimp <i>Lepidurus packardii</i>	USFWS, CDFW	FE/–	Shasta County south to Merced County	Vernal pools and ephemeral stock ponds	None; the Project Area does not contain suitable or critical habitat (USFWS 2006)
Western bumble bee <i>Bombus occidentalis</i>	CDFW	–/SCE	Throughout California and adjacent states	Uses flowering plants in meadows and forested openings; abandoned rodent burrows are used for nest and hibernation sites for queens	Low; species has experienced a significant decline in population and the predicted mean occupancy of the species in the western United States dropped by 93% (Graves et al. 2020); an occurrence of the species was documented in 1972, near Creed, approximately three miles from the Project Area (CDFW 2023a)
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	USFWS, CDFW	FT/–	Streamside habitats throughout the Central Valley; below 915 m (3,000 ft)	Riparian and oak savanna habitats with host plant <i>Sambucus</i> sp. (blue elderberry)	None; the Project Area does not contain blue elderberry (<i>Sambucus mexicana</i>), the primary host plant for the species; critical habitat is not present in the Project Area (USFWS 1980b)

Common name Scientific name	Query Sources	Status ^a Federal/ State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
Delta green ground beetle <i>Elaphrus viridus</i>	USFWS, CDFW	FT/–	Only known to occur in Solano County	Grassland habitat interspersed with vernal pools	Low; the Project Area does not contain high-quality habitat; the closest documented occurrences of the species were recorded between 1999 and 2002, approximately 4 miles west of the Project Area (CDFW 2023a); critical habitat for this species is not present in the Project Area (USFWS 1980a)
Monarch butterfly <i>Danaus plexippus</i>	USFWS	FC (CA over- wintering population) /–	Historical overwintering groves are typically between 1.5 miles of the California Coast or SF Bay	Overwintering groves are typically stands of blue gum eucalyptus (<i>Eucalyptus globulus</i>), Monterey pine (<i>Pinus radiata</i>) and Monterey cypress (<i>Cupressus macrocarpa</i>)	None; the Project Area is outside of the species' overwintering range

Fish

North American green sturgeon: southern DPS <i>Acipenser medirostris</i>	NMFS, CDFW	FT/–	San Francisco, San Pablo, Suisun, and Humboldt bays; Sacramento-San Joaquin Delta, Sacramento and Klamath rivers	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 bottom	Moderate; additional assessment included in Section 2.4.1.1 of the document
Sacramento splittail <i>Pogonichthys macrolepidotus</i>	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	Moderate; additional assessment included in Section 2.4.1.1 of the document

Common name Scientific name	Query Sources	Status ^a Federal/ State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
Delta smelt <i>Hypomesus transpacificus</i>	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 included in Section 2.4.1.1 of the document
Longfin smelt, San Francisco Bay-Delta DPS <i>Spirinchus thaleichthys</i>	CDFW	FPE/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; historical populations in Humboldt Bay, Eel River estuary, and Klamath River estuary	Adults in large bays, estuaries, and nearshore coastal areas; migrate into freshwater rivers to spawn; salinities of 15–30 ppt	Moderate; additional assessment included in Section 2.4.1.1 of the document
Chinook salmon, central Valley spring-run ESU <i>Oncorhynchus tshawytscha</i>	NMFS	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 included in Section 2.4.1.1 of the document
Chinook salmon, Sacramento River winter-run ESU <i>Oncorhynchus tshawytscha</i>	NMFS	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; rear five to ten months in the river and estuary; migrate to the ocean to feed and grow until sexually mature	Moderate; additional assessment included in Section 2.4.1.1 of the document

Common name Scientific name	Query Sources	Status ^a Federal/ State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
Steelhead, central California coast DPS <i>Oncorhynchus mykiss irideus</i>	NMFS	FT/–	Coastal California streams from the Russian River, south to Aptos Creek, San Francisco, San Pablo, and Suisun bays; the drainages of San Francisco, San Pablo, and Suisun bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin rivers; excludes the Sacramento San Joaquin Delta	Rivers and streams with cold water, clean gravel of appropriate size for spawning, and suitable rearing habitat; typically rear in fresh water for one or more years before migrating to the ocean	None; individuals occurring upstream of the Sacramento-San Joaquin River confluence are not considered to be CCC DPS steelhead; the Project Area is outside of the range for this DPS; critical habitat for this DPS is not present within the Project Area
Steelhead, Central Valley DPS <i>Oncorhynchus mykiss irideus</i>	NMFS, CDFW	FT/–	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 included in Section 2.4.1.1 of the document
Amphibians					
California tiger salamander, central California DPS <i>Ambystoma californiense</i>	USFWS, CDFW	FT/ST	Very fragmented; along the coast from Sonoma County to Santa Barbara County, in the Central Valley and Sierra foothills from Sacramento County to Tulare County	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; additional assessment included in Section 2.4.1.1 of the document

Common name Scientific name	Query Sources	Status ^a Federal/ State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
Foothill yellow- legged frog Northwest/North Coast clade <i>Rana boylei</i>	CDFW	–/SSC	From the Oregon border along the coast to the Transverse Ranges, and south along the western side of the Sierra Nevada Mountains to Kern County; a possible isolated population in Baja California	Shallow tributaries and mainstems of perennial streams and rivers, typically associated with cobble or boulder substrate	None; the Project Area does not contain suitable breeding or non-breeding habitat; the nearest occurrence of the species, documented in 1912, is approximately 14 miles northwest of the Project Area (CDFW 2023a)
Reptiles					
Northwestern pond turtle <i>Actinemys marmorata</i>	iNaturalist	FPT/SSC	From the Oregon border along the coast ranges to the Mexican border, and west of the crest of the Cascades and Sierras	Permanent, slow-moving fresh or brackish water with available basking sites and adjacent open habitats or forest for nesting	Moderate; additional assessment included in Section 2.4.1.1 of the document
Giant garter snake <i>Thamnophis gigas</i>	USFWS	FT/ST	Central Valley from the vicinity of Burrell 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	Moderate; additional assessment included in Section 2.4.1.1 of the document

Common name Scientific name	Query Sources	Status ^a Federal/ State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
Birds					
American white pelican <i>Pelecanus erythrorhynchos</i>	eBird	–/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	Moderate; additional assessment included in Section 2.4.1.1 of the document
White-tailed kite <i>Elanus leucurus</i>	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	Moderate; additional assessment included in Section 2.4.1.1 of the document
Bald eagle <i>Haliaeetus leucocephalus</i>	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.	Low (foraging only); the Project Area does not contain typical nesting habitat; however, individuals may forage in nearby sloughs, the Yolo Bypass, or the Sacramento River
Northern harrier <i>Circus hudsonius</i>	eBird	–/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; additional assessment included in Section 2.4.1.1 of the document

Common name Scientific name	Query Sources	Status ^a Federal/ State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
Swainson's hawk <i>Buteo swainsoni</i>	CDFW, eBird	–/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 in or near riparian habitats; forages in grasslands, irrigated pastures, and grain fields	High; additional assessment included in Section 2.4.1.1 of the document
Golden eagle <i>Aquila chrysaetos</i>	USFWS	BGEPA/ SFP	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); the Project Area does not contain suitable nesting habitat (cliffs or tall suitable nest trees); however, the species could forage in the open grassland habitat near the Project Area
American peregrine falcon <i>Falco peregrinus anatum</i>	CDFW	FD/SD, SFP	Most of California during migrations and in winter; nests primarily in the Coast Ranges, northern Sierra Nevada Mountains, and other mountainous areas of northern California	Wetlands, woodlands, cities, agricultural lands, and coastal area with cliffs (and rarely broken-top, predominant trees) for nesting; often forages near water	Low (foraging only); the Project Area does not contain suitable nesting habitat (cliffs); however, individuals may forage in the wetlands, agricultural lands, or grasslands around the Project Area
Yellow rail <i>Coturnicops noveboracensis</i>	CDFW	–/SSC	Extremely rare	Marshes	None/low; the closest documented occurrence was recorded in 2004 in Grizzly Island Wildlife Area, approximately 13 miles southwest of the Project Area (CDFW 2023a)

Common name Scientific name	Query Sources	Status ^a Federal/ State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
California black rail <i>Laterallus jamaicensis coturniculus</i>	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 (<i>Salicornia virginica</i>); also can be associated with bulrush (<i>Schoenoplectus</i> spp.), cattail (<i>Typha</i> spp.), or rushes (<i>Juncus</i> spp.); peripheral vegetation at and above mean high higher water necessary to protect nesting birds during extremely high tides	Low; additional assessment included in Section 2.4.1.1 of the document
California Ridgway's rail <i>Rallus obsoletus obsoletus</i>	CDFW	FE/SE, SFP	Predominantly in the 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 (<i>Salicornia virginica</i>) and Pacific cordgrass (<i>Spartina foliosa</i>)	None; the Project Area is outside the species' range
Mountain plover <i>Charadrius montanus</i>	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	Moderate (non-nesting only); additional assessment included in Section 2.4.1.1 of the document

Common name Scientific name	Query Sources	Status ^a Federal/ State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
Western yellow-billed cuckoo <i>Coccyzus americanus</i>	CDFW	FT/SE	Breeds in limited portions of the Sacramento River and the South Fork Kern River; small populations may nest in Butte, Yuba, Sutter, San Bernardino, Riverside, Inyo, Los Angeles, and Imperial counties	Summer resident of valley foothill and desert riparian habitats; nests in open woodland with clearings and low, dense, scrubby vegetation	Low; the species' breeding distribution is highly restricted and the current breeding range is outside of the Project Area; while western yellow-billed cuckoo could feasibly pass through the Project Area during migration, any individuals would be adults and there would be no anticipated impacts
Western burrowing owl <i>Athene cunicularia hypugaea</i>	CDFW	–/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 2.4.1.1 of the document
Short-eared owl <i>Asio flammeus</i>	CDFW, eBird	–/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. Eat small mammals	Moderate; additional assessment included in Section 2.4.1.1 of the document
Loggerhead shrike <i>Lanius ludovicianus</i>	eBird	–/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	Moderate; additional assessment included in Section 2.4.1.1 of the document

Common name Scientific name	Query Sources	Status ^a Federal/ State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
Saltmarsh common yellowthroat <i>Geothlypis trichas sinuosa</i>	CDFW	–/SSC	San Francisco Bay region	Brackish marsh, riparian woodland/swamp, freshwater marsh, and salt marsh often near upland habitats	None; the Project Area is outside the subspecies' range
Grasshopper sparrow <i>Ammodramus savannarum</i>	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; the Project Area is outside the species' breeding range; however, agricultural fields adjacent to the Project Area could support foraging; the closest occurrence of the species was recorded in 2017, approximately 6 miles northwest of the Project Area (CDFW 2023a)
Song sparrow ("Modesto" population) <i>Melospiza melodia</i>	CDFW	–/SSC	Year-round resident; north- central portion of the Central Valley	Emergent freshwater marshes, riparian willow thickets, and riparian forests	Moderate; additional assessment included in Section 2.4.1.1 of the document
Suisun song sparrow <i>Melospiza melodia maxillaris</i>	CDFW	–/SSC	Resident of Suisun Bay	Brackish-water marshes	None; the Project Area is outside the subspecies range
Tricolored blackbird <i>Agelaius tricolor</i>	CDFW	–/ST	Permanent resident, but makes extensive migrations both in breeding season and winter; common locally throughout Central Valley and in coastal areas from Sonoma County south	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	Moderate; additional assessment included in Section 2.4.1.1 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 <i>Xanthocephalus</i> <i>xanthocephalus</i>	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 (<i>Schoenoplectus</i> spp.) or cattails (<i>Typha</i> spp.); nests are typically in moderately dense vegetation; forage within wetlands and surrounding grasslands and croplands	Moderate; additional assessment included in Section 2.4.1.1 of the document
Mammals					
Salt marsh harvest mouse <i>Reithrodontomys</i> <i>raviventris</i>	CDFW	FE/SE, SFP	San Pablo, Suisun, and San Francisco bays in Marin, Sonoma, Napa, Solano, Contra Costa, Alameda, Santa Clara, and San Mateo counties	Tidal salt marshes; depend on dense cover, preferring pickleweed (<i>Salicornia pacifica</i>) and saltgrass	None; the Project Area is outside the species' range
Suisun shrew <i>Sorex ornatus</i> <i>sinuosus</i>	CDFW	–/SSC	Along the north shore of San Pablo and Suisun bays, from Tubbs Island/Sonoma Creek in Sonoma County east to Grizzly Island in Solano County	Areas of low, dense vegetation, in salt and brackish marshes	None; the Project Area is outside the species' range
Western red bat <i>Lasiurus</i> <i>blossevillei</i>	CDFW	–/SSC	Near the Pacific Coast, Central Valley, and the Sierra Nevada	Riparian forests, woodlands near streams, fields and orchards	Low; the Project Area contains scattered trees along Hastings Cut and Lindsey Slough that may be suitable for roosting; however, Hastings Tract does not contain true forest or woodland; the closest documented occurrence, recorded in 1999, is approximately 12 miles east of the Project Area (CDFW 2023a)

Common name Scientific name	Query Sources	Status ^a Federal/ State	Distribution in California	Habitat Association	Likelihood to Occur in Project Area
American badger <i>Taxidea taxus</i>	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; while levee shoulders within the Project Area may contain suitable denning habitat, the closest documented occurrence, recorded in 2016, is approximately 13 miles northwest of the Project Area (CDFW 2023a)

Notes: CDFW = California Department of Fish and Wildlife; NMFS = National Marine Fisheries Service; USFWS = United States Fish and Wildlife Service

^a Status codes:

Federal

FE = Listed as endangered under the federal Endangered Species Act

FPE = Federally proposed as endangered

FT = Listed as threatened under the federal Endangered Species Act

FPT = Federally proposed as threatened

FC = Federal candidate species

FD = Federally delisted

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

SD = State Delisted

SSC = CDFW Species of Special Concern

SFP = CDFW Fully Protected species

References

- Bennett, W. A. 2005. Critical assessment of the delta smelt population in the San Francisco Estuary, California. San Francisco Estuary and Watershed Science [online serial] Volume 3. Available at: <http://repositories.cdlib.org/jmie/sfews/vol3/iss2/art1/>.
- CDFW (California Department of Fish and Wildlife). 2023a. California Natural Diversity Database (CNDDDB) – Rarefind Version 5. Internet Application. California Department of Fish and Wildlife, Sacramento, California.
- CDFW. 2023b. 20 mm Trawl Fish Distribution Map. Website. https://www.dfg.ca.gov/delta/data/20mm/CPUE_map.asp. Prepared by California Department of Fish and Wildlife, Sacramento, California. [Accessed December 2022]
- CDFW. 2023c. Unprocessed Data from CNDDDB Online Field Survey Form [ds1002]. California Department of Fish and Wildlife. Biogeographic Information and Observation System (BIOS). Available at: <http://bios.dfg.ca.gov>.
- eBird. 2023. An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: <http://www.ebird.org>. [Accessed: February 2023].
- Graves, T. A., Janousek, W. M., Gaulke, S. M., Nicholas, A. C., Keinath, D. A., Bell, C. M., Cannings, S., Hatfield, R. G., Heron, J. M., Koch, J. B., Loffland, H. L., Richardson, L. L., Rohde, A. T., Rykken, J., Strange, J. P., Tronstad, L. M., and Sheffield, C. S. 2020. Western bumble bee: declines in the continental United States and range-wide information gaps. *Ecosphere* 11: e03141. 10.1002/ecs2.3141.
- iNaturalist. 2023. Available from <https://www.inaturalist.org>. Accessed June 2023.
- Merz J. E., Hamilton S., Bergman P. S, Cavallo B. 2011. Spatial perspective for delta smelt: a summary of contemporary survey data. *Calif Fish Game* 97:164–189.
- Moyle, P. B. 2002. *Inland Fishes of California*. University of California Press, Berkeley.
- Moyle P. B., R. D. Baxter, T. Sommer, T. C. Foin, and S. A. Matern. 2004. Biology and population dynamics of Sacramento splittail (*Pogonichthys macrolepidotus*) in the San Francisco Estuary: A review. *San Francisco Estuary and Watershed Science* [online serial] 2: Article 3.
- NMFS (National Marine Fisheries Service). 2005. Endangered and Threatened Species; Designation of Critical Habitat for Seven Evolutionarily Significant Units of Pacific Salmon and Steelhead in California. *Federal Register* 70: 52,488–52,627.
- NMFS. 2009. Endangered and threatened wildlife and plants: final rulemaking to designate critical habitat for the threatened southern distinct population segment of North American green sturgeon. *Federal Register* 74: 52,300–52,351.
- Orloff, S.G. 2011. Movement patterns and migration distances in an upland population of California tiger salamander (*Ambystoma californiense*). *Herpetological Conservation and Biology* 6:266–276.

Radtke, L. D. 1966. Distribution of smelt, juvenile sturgeon, and starry flounder in the Sacramento-San Joaquin Delta with observations on food of sturgeon. California Fish and Game Bulletin 136: 115–126.

USFWS (United States Fish and Wildlife Service). 1980a. Endangered and Threatened Wildlife and Plants; Listing the Delta Green Ground Beetle as a Threatened Species With Critical Habitat. Federal Register 48: 52807–52810.

USFWS 1980b. Endangered and Threatened Wildlife and Plants; Listing the Valley Elderberry Longhorn Beetle as a Threatened Species With Critical Habitat. Federal Register 48: 52803–52807.

USFWS. 2004. Formal Programmatic Consultation on the Issuance of Section 10 and 404 Permits for Projects with Relatively Small Effects on the delta smelt (*Hypomesus transpacificus*) and its Critical Habitat. Service File Number: 1-1-04-F-0345. Sacramento Fish and Wildlife Office, Sacramento, California.

USFWS. 2005. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the California Tiger Salamander, Central Population: Final Rule. Federal Register 70: 49380–49458

USFWS 2006. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Four Vernal Pool Crustaceans and Eleven Vernal Pool Plants. Federal Register 71: 7118–7311.

Young, Y. J., Martin Perales, K., Durand, J. R., Moyle, P. B. 2015. Fish Distribution in the Cache Slough Complex of the Sacramento-San Joaquin Delta during Drought. IEP Newsletter Volume 28, Number 3, 2015.

Appendix D

Comprehensive List of Plant Species Documented during Special-status Plant Surveys for the Hastings Tract Pipe Replacement Project

Table D-1. Comprehensive list of plant species documented during special-status plant surveys for the Hastings Tract Pipe Replacement Project

Scientific name ¹	Common name	Family	Native?	Cal-IPC rating ²
<i>Achyrachaena mollis</i>	blow wives	Asteraceae	Yes	–
<i>Alnus rhombifolia</i>	white alder	Betulaceae	Yes	–
<i>Ambrosia psilostachya</i>	western ragweed	Asteraceae	Yes	–
<i>Anthriscus caucalis</i>	bur-chervil	Apiaceae	No	–
<i>Apocynum cannabinum</i>	hemp dogbane	Apocynaceae	Yes	–
<i>Arundo donax</i>	giant reed	Poaceae	No	High
<i>Avena fatua</i>	wild oat	Poaceae	No	Moderate
<i>Brassica nigra</i>	black mustard	Brassicaceae	No	Moderate
<i>Bromus diandrus</i>	ripgut grass	Poaceae	No	Moderate
<i>Bromus hordeaceus</i>	soft chess	Poaceae	No	Limited
<i>Bromus madritensis</i>	foxtail chess	Poaceae	No	–
<i>Capsella bursa-pastoris</i>	shepherd's purse	Brassicaceae	No	–
<i>Carduus pycnocephalus</i> subsp. <i>pycnocephalus</i>	Italian thistle	Asteraceae	No	Moderate
<i>Carex pellita</i>	woolly sedge	Cyperaceae	Yes	–
<i>Carex barbarae</i>	whiteroot	Cyperaceae	Yes	–
<i>Centaurea melitensis</i>	totalote	Asteraceae	No	Moderate
<i>Centaurea solstitialis</i>	yellow star-thistle	Asteraceae	No	High
<i>Centromadia parryi</i> subsp. <i>rudis</i>	Parry's rough tarplant	Asteraceae	Yes	–
<i>Ceratophyllum demersum</i>	coon's tail	Ceratophyllaceae	Yes	–
<i>Cirsium vulgare</i>	bull thistle	Asteraceae	No	Moderate
<i>Conium maculatum</i>	poison hemlock	Apiaceae	No	Moderate
<i>Convolvulus arvensis</i>	bindweed	Convolvulaceae	No	–
<i>Cornus sericea</i>	American dogwood	Cornaceae	Yes	–
<i>Croton setiger</i>	doveweed	Euphorbiaceae	Yes	–
<i>Distichlis spicata</i>	salt grass	Poaceae	Yes	–
<i>Eichhornia crassipes</i>	common water hyacinth	Pontederiaceae	No	High
<i>Elodea canadensis</i>	common waterweed	Hydrocharitaceae	Yes	–
<i>Elymus ponticus</i>	tall wheat grass	Poaceae	No	–
<i>Elymus triticoides</i>	beardless wild rye	Poaceae	Yes	–
<i>Epilobium brachycarpum</i>	tall annual willowherb	Onagraceae	Yes	–
<i>Epipactis gigantea</i>	stream orchid	Orchidaceae	Yes	–
<i>Equisetum hyemale</i> subsp. <i>affine</i>	common scouring rush	Equisetaceae	Yes	–
<i>Erigeron canadensis</i>	horseweed	Asteraceae	Yes	–
<i>Erodium cicutarium</i>	redstem filaree	Geraniaceae	No	Limited
<i>Erodium moschatum</i>	greenstem filaree	Geraniaceae	No	–
<i>Eucalyptus camaldulensis</i>	red gum	Myrtaceae	No	Limited

Scientific name ¹	Common name	Family	Native?	Cal-IPC rating ²
<i>Euthamia occidentalis</i>	western goldenrod	Asteraceae	Yes	–
<i>Festuca microstachys</i>	desert fescue	Poaceae	Yes	–
<i>Festuca myuros</i>	rattail sixweeks grass	Poaceae	No	Moderate
<i>Festuca perennis</i>	rye grass	Poaceae	No	Moderate
<i>Foeniculum vulgare</i>	fennel	Apiaceae	No	Moderate
<i>Frankenia salina</i>	alkali heath	Frankeniaceae	Yes	–
<i>Fraxinus latifolia</i>	Oregon ash	Oleaceae	Yes	–
<i>Geranium dissectum</i>	cutleaf geranium	Geraniaceae	No	Limited
<i>Helminthotheca echioides</i>	bristly ox-tongue	Asteraceae	No	Limited
<i>Hordeum marinum</i> subsp. <i>gussoneanum</i>	Mediterranean barley	Poaceae	No	Moderate
<i>Hordeum murinum</i>	wall barley	Poaceae	No	Moderate
<i>Hydrocotyle verticillata</i>	whorled marshpennywort	Araliaceae	Yes	–
<i>Iris pseudacorus</i>	paleyellow iris	Iridaceae	No	Limited
<i>Isolepis cernua</i>	low bulrush	Cyperaceae	Yes	–
<i>Juncus mexicanus</i>	Mexican rush	Juncaceae	Yes	–
<i>Lactuca serriola</i>	prickly lettuce	Asteraceae	No	–
<i>Lamium amplexicaule</i>	henbit	Lamiaceae	No	–
<i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	Delta tule pea	Fabaceae	Native	–
<i>Lepidium latifolium</i>	perennial pepperweed	Brassicaceae	No	High
<i>Lepidium nitidum</i>	shining pepperweed	Brassicaceae	Yes	–
<i>Lilaeopsis masonii</i>	Mason's lilaeopsis	Apiaceae	Native	–
<i>Lotus corniculatus</i>	bird's-foot trefoil	Fabaceae	No	–
<i>Malva nicaeensis</i>	bull mallow	Malvaceae	No	–
<i>Malvella leprosa</i>	alkali-mallow	Malvaceae	Yes	–
<i>Matricaria discoidea</i>	pineapple weed	Asteraceae	Yes	–
<i>Medicago polymorpha</i>	California burclover	Fabaceae	No	Limited
<i>Medicago sativa</i>	alfalfa	Fabaceae	No	–
<i>Melilotus albus</i>	white sweetclover	Fabaceae	No	–
<i>Melilotus indicus</i>	sourclover	Fabaceae	No	–
<i>Parapholis incurva</i>	curved sicklegrass	Poaceae	No	–
<i>Paspalum dilatatum</i>	dallis grass	Poaceae	No	–
<i>Phalaris aquatica</i>	harding grass	Poaceae	No	Moderate
<i>Phyla nodiflora</i>	turkey tangle fogfruit	Verbenaceae	Yes	–
<i>Plantago lanceolata</i>	English plantain	Plantaginaceae	No	Limited
<i>Plantago major</i>	common plantain	Plantaginaceae	No	–
<i>Poa annua</i>	annual blue grass	Poaceae	No	–
<i>Polygonum aviculare</i>	knotweed	Polygonaceae	No	–

Scientific name ¹	Common name	Family	Native?	Cal-IPC rating ²
<i>Pseudognaphalium luteoalbum</i>	Jersey cudweed	Asteraceae	No	–
<i>Psilocarphus tenellus</i>	slender woolly-marbles	Asteraceae	Yes	–
<i>Quercus lobata</i>	valley oak	Fagaceae	Yes	–
<i>Rosa californica</i>	California rose	Rosaceae	Yes	–
<i>Rubus armeniacus</i>	Himalayan blackberry	Rosaceae	No	High
<i>Rubus ursinus</i>	California blackberry	Rosaceae	Yes	–
<i>Rumex crispus</i>	curly dock	Polygonaceae	No	Limited
<i>Salix exigua</i>	narrowleaf willow	Salicaceae	Yes	–
<i>Salix lasiolepis</i>	arroyo willow	Salicaceae	Yes	–
<i>Schoenoplectus acutus</i> var. <i>occidentalis</i>	common tule	Cyperaceae	Yes	–
<i>Schoenoplectus californicus</i>	southern bulrush	Cyperaceae	Yes	–
<i>Senecio vulgaris</i>	common groundsel	Asteraceae	No	–
<i>Silybum marianum</i>	blessed milkthistle	Asteraceae	No	Limited
<i>Sonchus asper</i> subsp. <i>asper</i>	prickly sow thistle	Asteraceae	No	–
<i>Sonchus oleraceus</i>	common sow thistle	Asteraceae	No	–
<i>Stipa miliacea</i> var. <i>miliacea</i>	smilo grass	Poaceae	No	Limited
<i>Symphotrichum lentum</i>	Suisun Marsh aster	Asteraceae	Native	–
<i>Trifolium fragiferum</i>	strawberry clover	Fabaceae	No	–
<i>Triticum aestivum</i>	common wheat	Poaceae	No	–
<i>Typha angustifolia</i>	narrow-leaved cattail	Typhaceae	Yes or No	–
<i>Verbena lasiostachys</i>	western vervain	Verbenaceae	Yes	–
<i>Vicia sativa</i> subsp. <i>sativa</i>	spring vetch	Fabaceae	No	–
<i>Zeltnera muehlenbergii</i>	Monterey centaury	Gentianaceae	Yes	–

¹ Special status species are denoted in bold font.

² Cal-IPC ratings (Cal-IPC 2023):

- 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.

Appendix E

Public Comments and Responses on the Draft IS/MND for the Hastings Tract Pipe Replacement Project

Table E-1. Public Comments on the Draft Initial Study/Mitigated Negative Declaration for the Hastings Tract Pipe Replacement Project.

Comment No.	Public Draft IS/MND Comments and Responses
California Department of Fish and Wildlife	
CDFW-1	Comment: <u>Species Surveys and Timing</u> <i>Pre-construction surveys for special-status species should be conducted by qualified biologists at the Project site prior to any Project-related construction no earlier than seven days prior to start of work, unless otherwise specified in this comment letter. Once construction has commenced, pre-construction clearance surveys should be conducted by a qualified biologist each day prior to start of construction.</i> Response: Added text to applicable measures that preconstruction surveys will be conducted no earlier than seven days prior to start of work. Added text to CM-2 to scan staging areas as well as areas under and around vehicles and equipment for wildlife.
CDFW-2	Comment: <u>General Nesting Bird Survey Requirements</u> <u>Issue:</u> <i>Measure MM-4 would not adequately reduce impacts to nesting birds to a level of less-than-significant. The IS/MND does not discuss nesting bird survey requirements for all bird species; it only includes information about bird nest survey focusing on raptor species. Additionally, MM-4 does not include an adequate survey radius relative to nest sites or nest trees that could prevent potential impacts to raptors. The measure does not provide adequate details about nest monitoring timeline and requirements to ensure the qualified biologist does not miss signs of disturbance and/or distress. Without an adequate protocol specified, Project related impacts to nesting birds could lead to significant impacts to nesting birds including, but not limited to, nest abandonment, nest failure, impacts to availability of forage, chick mortality and resultant population decline.</i> <u>Recommendations:</u> <i>CDFW recommends the IS/MND incorporate the following revisions to language in Measures MM-4 to ensure that significant impacts to bird species resulting from the Project are mitigated to a level of less-than-significant.</i> Construction work should take place outside of the February 15 to September 15 bird nesting seasonal window to the maximum extent practicable. If construction is to be conducted during the nesting season, the Project Applicant is responsible for ensuring that the Project does not result in any violation of the Migratory Bird Treaty Act (MBTA) or Fish and Game Code. A qualified biologist will conduct focused pre-construction nesting bird surveys throughout the Project area no more than five days prior to the initiation of on-site Project-related activities. Surveys will be conducted in all potential habitat located at, and adjacent to, Project work sites and in staging and storage areas. The minimum survey radii surrounding the work area will be the following: (1) 250 feet for Passerines; (2) and 1,000 feet for raptors such as <i>Buteo</i> spp. In the event that there is a lapse in construction activities for seven days or more, a qualified biologist will conduct additional focused pre-construction nesting bird surveys in areas of potential habitat again before Project activities can be reinitiated. If an active nest is found, the qualified biologist may consult with CDFW if needed regarding appropriate action to comply with Fish and Game Code.

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	- Active Nest Buffers. Active nest sites and protective buffer zones will be designated as “ecologically sensitive areas” where no Project-related activities or personnel may enter (while occupied or in use for the season in the case of multi clutch bearing species) during the course of nesting bird season with the establishment of a fence barrier or flagging surrounding the nest site. The qualified biologist will determine the necessary buffer, in consultation with CDFW if needed, to protect nesting birds based on existing site conditions, such as construction activity, topography, and line of sight, and will increase buffers as needed to provide sufficient protection of nesting birds and their natural behaviors. - Active Nests. A qualified biologist will observe any identified active nests prior to the start of any Project-related activities to establish a behavioral baseline of the adults and any nestlings. Once Project activities commence, all active nests will be continuously monitored by a qualified biologist to detect any signs of disturbance and behavioral changes as a result of the Project. In addition to direct impacts, such as nest destruction, nesting birds might be affected by noise, vibration, odors and movement of workers or equipment. If signs of disturbance and behavioral changes are observed, the qualified biologist will halt Project activities causing that change until the nestlings have fledged, and the nest is determined to be inactive. Response: Incorporated recommended text as a new measure, MM-9, with minor edits and clarifications. Moved references regarding nesting birds from original measure MM-3 to new measure MM-9 to avoid confusion.
CDFW-3	Comment: <u>Swainson’s Hawk</u> <i>Issue:</i> MM-4 of the IS/MND may not be sufficient to avoid potentially significant impacts to Swainson’s hawk, a state threatened species. The California Natural Diversity Database (CNDDB) indicates multiple occurrences within a 5-mile radius of the Project site and one occurrence is within the 0.5-mile avoidance buffer as well as potentially suitable nest trees. MM-4 does not sufficiently avoid potentially significant impacts to Swainson’s Hawk. <i>The estimated historical population of Swainson’s hawk was nearly 17,000 pairs; however, in the late 20th century, Bloom (1980) estimated a population of only 375 pairs. The decline was primarily a result of habitat loss from development (CDFW 2016). The most recent survey conducted in 2009 estimated the population at 941 breeding pairs. The breeding population of Swainson’s hawks in California has declined by an estimated 91 percent since 1900 (CDFW 2016). The species is currently threatened by loss of nesting and foraging habitat (e.g., from agricultural shifts to less crops that provide less suitable habitat), urban development, environmental contaminants (e.g., pesticides), and climate change (CDFW 2016).</i> <i>Recommendations to minimize significant impacts:</i> To avoid “take” or adverse impacts, CDFW recommends replacing MM-4 with the following measure into the IS/MND: <u>Recommended Mitigation Measure 1 – Swainson’s Hawk Protocol Surveys:</u> If Project work will occur during the breeding season for nesting birds (February 15 to September 15), CDFW recommends surveys be conducted according to the Swainson’s Hawk Technical Advisory Committee’s (TAC) Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in

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	California's Central Valley (CDFW, 2010) found at https://wildlife.ca.gov/Conservation/SurveyProtocols. CDFW recommends that the TAC survey method be strictly followed by starting early in the nesting season (late March to early April) in order to maximize the likelihood of detecting an active nest. Surveys should be conducted within a minimum five-mile radius of the proposed Project area and should be completed for at least the two survey periods immediately prior to initiating any Project-related construction work. Raptor nests may be very difficult to locate during egg-laying or incubation, or chick brooding periods (late April to early June) if earlier surveys have not been conducted. These full-season surveys may assist with Project planning, development of appropriate avoidance, minimization and mitigation measures, and may help avoid any Project delays. 2. <u>Recommended Mitigation Measure 2 – Swainson's Hawk Nests</u>: CDFW recommends avoiding all Project-related disturbance within a minimum of 0.5 miles of an active Swainson's hawk nest during the nesting season. Please refer to the CDFW guidance document on Swainson's hawk (CDFW, 1994, 2010) take avoidance, minimization and mitigation measures. Early consultation with CDFW and other natural resource agencies on Swainson's hawk take avoidance, minimization and mitigation measures is strongly recommended. 3. <u>Recommended Mitigation Measure 2 – Swainson's Hawk Take Prohibition</u>: If "take" of Swainson's hawk or any other species listed under CESA cannot be avoided either during Project activities or over the life of the Project, a CESA Permit must be obtained (pursuant to Fish and Game Code Section 2080 et seq.). If an active nest is identified within the Project's no-disturbance buffer up to 0.5 miles, the Permittee should seek a CESA permit prior to commencing the Project if work is planned during nesting season. Issuance of a CESA Permit is subject to CEQA documentation; therefore, the CEQA document must specify impacts, mitigation measures, and a mitigation monitoring and reporting program. If the proposed Project will impact any CESA-listed species, early consultation is encouraged, as significant modification to the Project and mitigation measures may be required in order to obtain a CESA Permit. More information on the CESA permitting process can be found on the CDFW website at https://wildlife.ca.gov/Conservation/CESA. Response: MM-4 has been updated to follow the TAC methodologies and guidelines for Swainson's hawk surveys. The following items have also been incorporated into the measure: • The specific nesting season for Swainson's hawk, March 1 through September 15, as recommended in the Staff Report regarding Mitigation for Impacts to Swainson's Hawks (<i>Buteo swainsoni</i>) in the Central Valley of California (CDFW 1994). • The recommendation to conduct surveys during Period II (as detailed in TAC), as much as feasible. The survey radius (0.25 mile from the Project Area) will remain unchanged; this radius is recommended in both the Staff Report regarding Mitigation for Impacts to Swainson's Hawks in the Central Valley of California (CDFW 1994) and the Swainson's Hawk Technical Advisory Committee's (2000) Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley documents.

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CDFW-4	Comment: <u>Burrowing Owls</u> Issues: The IS/MND acknowledges that Project has the potential to impact burrowing owl. However, the IS/MND does not include measures addressing impacts to this species. If burrowing owls that may be impacted by the Project are not detected, the Project may result in reduced health and vigor, or mortality, of owls from direct impacts to occupied wintering habitat or from wintering burrow abandonment caused by auditory and visual disturbances (Klute et. al 2003). Burrowing owl is a California SSC and protected under Fish and Game Code sections 3503 and 3503.5 and the federal MBTA. Therefore, if wintering burrowing owls are present on or within 1,640 feet of the Project site, Project impacts to burrowing owl would be potentially significant. Recommendation: For an adequate environmental setting evaluation and to reduce impacts to burrowing owl to less-than-significant, CDFW recommends incorporating the following mitigation measure to address impacts to burrowing owl: A qualified biologist shall conduct a habitat assessment for wintering burrowing owl, and surveys if habitat is present. The qualified biologist shall follow the California Department of Fish and Game (now CDFW) 2012 Staff Report on Burrowing Owl Mitigation (CDFW 2012 Staff Report) habitat assessment and survey methodology prior to Project activities occurring during the burrowing owl wintering season from September 1 to January 31. The habitat assessment and surveys shall encompass a sufficient buffer zone to detect owls nearby that may be impacted, which shall be a minimum of 1,640 feet unless otherwise approved in writing by CDFW. Surveys shall include four non-breeding season surveys spread evenly throughout the nonbreeding season pursuant to the CDFW 2012 Staff Report. Time lapses between surveys or Project activities shall trigger subsequent surveys, as determined by a qualified biologist, including, but not limited to, a final survey within 24 hours prior to ground disturbance and before construction equipment mobilizes to the Project area. The qualified biologist shall have a minimum of two years of experience implementing the CDFW 2012 Staff Report survey methodology resulting in detections. Detected burrowing owls shall be avoided pursuant to the buffer zone prescribed in the CDFW 2012 Staff Report, unless otherwise approved in writing by CDFW, and any eviction plan shall be subject to CDFW review. Please be advised that CDFW does not consider eviction of burrowing owls (i.e., passive removal of an owl from its burrow or other shelter) as a “take” avoidance, minimization, or mitigation measure; therefore, offsite habitat compensation shall be included in the eviction plan. Habitat compensation acreages shall be approved by CDFW, as the amount depends on site-specific conditions, and completed before Project construction unless otherwise approved in writing by CDFW. It shall also include placement of a conservation easement and preparation and implementation of a long-term management plan prior to Project construction. Response: Incorporated with modifications. CDFW’s recommendation specifies wintering or non-breeding populations of western burrowing owls. Based on the proposed work window of May through November, a new measure MM-10 has been added using recommendations from the CDFW Staff Report on Burrowing Owl Mitigation (CDFW 2012), which includes surveys year-round with various areas of focus based on timing.

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CDFW-5	<u>Comment: California Black Rails</u> <i><u>Issue:</u> The IS/MND acknowledges California black rail has been observed within 0.5 miles of the Project site, however, IS/MND states that it does not include measures due to the Project site having “minimal intact tidal marsh”. Even if there is limited available marsh habitat, this does not prevent the potential for black rail to occur on-site. Operation of heavy equipment and associated activities may cause breeding rails to temporarily or permanently leave the site. Construction activities may include the temporary or permanent installation of fencing, posts, poles, or other structures that may provide perching opportunities for avian predators of California black rail. Nest abandonment or reduced frequency or duration of care for young, as well as decreased time spent foraging and roosting, resulting in reduced health or vigor of all life stages may occur as a result of Project construction activities.</i> <i>California black rail is listed as a state threatened species under CESA, as well as state fully protected. Injury or mortality to state listed fish species directly or indirectly from Project activities may further the population decline of a species already at risk. Loss of emergent saline wetland habitat and upland refugia in and adjacent to the San Francisco Bay has contributed to declines in local populations of both rail species. Project impacts may further population declines of these species, including cumulative impacts resulting in the restriction of their range.</i> <i><u>Recommendations:</u> For an adequate environmental setting evaluation and to reduce impacts to black rails to less-than-significant, CDFW recommends incorporating the following mitigation measures to address impacts to black rails:</i> <i><u>Recommendation #1: Rail Surveys</u></i> <i>California black rail protection should be modified to specify that appropriately timed rail surveys using the 2015 California Clapper Rail Survey Protocol will be conducted in each year of construction in all suitable habitat within the Project. This protocol is recommended for conducting presence/absence surveys of California Ridgway’s rail prior to Project construction (as opposed to other available protocols that may be more suitable for long-term monitoring purposes). CDFW staff are available to work with you to incorporate calls of California black rail into the 2015 protocol to ensure that both species are sufficiently surveyed.</i> <i><u>Recommendation #2: Rail Buffers</u></i> <i>The IS/MND should include a measure requiring a 700-foot no-work buffer to be implemented between the location of construction activities and any current-year breeding rail detections if construction cannot be avoided during the rail breeding season. The 700-foot no-work buffers should be clearly marked with fencing or flagging to exclude workers from entering the no-work zone. If establishing a 700-foot buffer around breeding rail detections is not feasible, noise reducing modifications to equipment as well as portable acoustic barriers/blankets placed near noise sources may be appropriate to reduce auditory and visual impacts to breeding rails. Note that these features may be appropriate regardless of time of year to minimize impacts to foraging rails as well.</i> <i><u>Recommendation #3: Authority to Stop Work</u></i>

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	<i>The IS/MND should include language that specifies that the qualified biologist will have authority to stop work any time construction activities appear to cause disturbance to nesting rails (e.g., rails vocalize or fly away from a nest) or an active rail nest is found.</i> <u><i>Recommendation #4: Avoid Predator Perching Structures</i></u> <i>The IS/MND should include language that strives to avoid the temporary or permanent construction of features that may provide perching opportunities for avian predators. If needed for the Project, such features may be retrofitted with anti-perching devices to reduce the likelihood that avian predators will use them to perch.</i> Response: Added a new measure, MM-11, which includes preconstruction surveys for black rail in suitable habitat. Because the Project Area is outside of the known range for California Ridgway's rail, there will be no targeted California Ridgway's rail measures, and the 2015 California Clapper Rail Survey Protocol was not incorporated.
CDFW-6	Comment: <u><i>Special-Status Plants</i></u> <u><i>Issue:</i></u> CDFW recognizes that two botanical surveys have occurred on this Project site on April 21, 2023 and June 5, 2023. It is understood that three special-status plant species were identified on the Project site; Delta tule pea, Mason's lilaeopsis, and Suisun marsh aster. Though these species were identified on-site during the two days of surveys conducted, these surveys were conducted within the same year, which may not capture the year-to-year variation in special-status plant species presence within a Project area. There are many special-status plant species with the potential to occur on this Project site based on CNDDDB records. To better ensure that special-status plants are documented on-site, two years of surveys are recommended. <u><i>Recommendation:</i></u> For an adequate environmental setting and to reduce impacts to CESA and federally listed plants to less-than-significant, CDFW recommends adding the following information to MM-2: The Project shall complete two years of protocol-level botanical surveys and incorporate the results into a revised IS/MND. The botanical survey results shall follow CDFW's 2018 Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Sensitive Natural Communities, including, but not limited to, conducting surveys during appropriate conditions, utilizing appropriate reference sites, and evaluating all direct and indirect impacts such as altering offsite hydrological conditions where the above species may be present. Surveys conducted during drought conditions may not be acceptable. If the botanical surveys result in the detection of the above CESA listed plants that may be impacted by the Project, or the presence of these species is assumed, the Project applicant shall obtain a CESA ITP from CDFW prior to construction and comply with all requirements of the ITP. CDFW agrees that a Mitigation and Monitoring Plan should be prepared and implemented prior to Project implementation for all special-status plants found during surveys. The IS/MND should outline which species of special-status plants will be impacted and should provide a well-developed, robust proposal for how the Project would be re-designed to avoid, minimize and/or mitigate impacts to those special-status

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	<i>plants. The applicant should provide a copy of the special-status plant survey results to CDFW for review and acceptance.</i> Response: The IS/MND currently outlines which special-status plant species have the potential to be impacted (based on protocol-level surveys conducted during a wet water year) as well as measures designed to avoid, minimize, and/or mitigate potential impacts to those special-status plants. MM-2 has been revised to include methods for protocol-level preconstruction plant surveys consistent with CDFW-required permit conditions from other similar flood protection projects along levees in the Delta, including following CDFW's 2018 Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Sensitive Natural Communities. If it is determined that CESA-listed plants may be impacted by the Project, an ITP will be requested, and any requirements of the ITP will be followed during implementation.
CDFW-7	Comment: <u>Crotch's Bumblebee</u> <u>Issue:</u> <i>The IS/MND states there is potential of Crotch's bumblebee, a candidate endangered species under CESA, occurring on-site. The Project area is within the current known range of the Crotch's bumble bee and suitable nesting habitat for the species is present in the Project area. However, due to the assessment of having low potential for occurrence, the IS/MND does not include measures to reduce potential impacts, including any survey protocols or limitations on removing floral resources in suitable habitat areas within the Project footprint. As discussed in the prior section, the Project site contains floristic resources, including three special-status flowering plants that have already been documented on-site. There is potential for encountering Crotch's bumblebee on-site that rely on floral resources during pollination.</i> <i>Potential adverse effects to this species from mechanical and hand labor treatments include direct mortality through crushing or filling of active bee colonies and hibernating bee cavities, reduced reproductive success, loss of suitable breeding and foraging habitats, and loss of native vegetation that may support essential foraging habitat. Bumblebees are critically important because they pollinate a wide range of plants over the lifecycles of their colonies, which typically live longer than most native solitary bee species.</i> <i>Crotch's bumble bee are a candidate species under CESA (CEQA Guidelines, §15380, subds. (c)(1)). Unauthorized take of this species pursuant to CESA is a violation of California Fish and Game Code section 2080 et. seq.</i> <u>Recommendation:</u> <i>To reduce impacts to less-than-significant, CDFW recommends including a mitigation measure for focused surveys to be conducted during the colony active period (i.e., April through August) and when floral resources are in peak bloom. Bumble bees move nests sites each year, therefore, surveys should be conducted each year that Project work activities will occur. Further guidance on presence surveys can be found within Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species (https://wildlife.ca.gov/Conservation/CESA).</i>

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	Response: A new measure has been added, MM-12, which includes a preconstruction survey for special-status bumble bees and the identification of active nests. However, there is no statement in the IS/MND regarding Crotch’s bumble bee (<i>Bombus crotchii</i>), as it was not identified as a special-status species with potential to occur near the Project Area based on species’ database queries. The nearest documented occurrence of the species—over 14 miles away from the Project Area—is from 2007 (CDFW 2023).
CDFW-8	Comment: <u>Fish Species</u> <u>Issue:</u> CDFW acknowledges and appreciates the incorporated measures MM-6, MM-7, and MM-8 to minimize impacts to fish species during Project activities. However, CDFW recommends several additions/modifications to the measures to better ensure successful relocation results and address impacts to fish. <u>Recommendations #1: Take Coverage</u> CDFW recommends obtaining take coverage through an ITP issued by CDFW due to the need for handling listed fish species during relocation efforts. An ITP should be obtained prior to any activities that may result in take of the species, including capture and relocation, in addition to mortality. <u>Recommendation #2: Fish Capture and Relocation Plan</u> MM-6 indicates that “a qualified biologist will note the number of individuals observed in the affected area, the number of individuals relocated, the approximate size of individuals, the location of capture and release, any instances of injury or mortality, and the date and time of the collection and relocation.” While these are effective data to collect, the focus of the rescue effort should be to catch and release fish while keenly identifying listed species to prioritize their release. Attempting to measure and identify all fish species risks slowing down the rescue attempts and may lead to more mortality than necessary. Additionally, CDFW recommends approving a biologist particularly versed in identification of Delta smelt and Wakasagi smelt. Wakasagi smelt are difficult to distinguish from Delta smelt and are commonly found within agricultural channels. If Delta smelt or longfin smelt are identified, they should be separated to a recovery tank in an attempt to save them due to their overall fragility during recovery efforts. As described in MM-6, CDFW looks forward to reviewing the Fish Capture and Relocation Plan in coordination with USFWS and National Marine Fisheries Service (NMFS). CDFW recommends submitting this Plan at least 90 days prior to the start of proposed work to provide adequate time for interagency coordination and providing comments. <u>Recommendation 3: Fish Entrainment Impacts</u> The IS/MND does not analyze impacts associated with the ongoing operation of the Project, specifically entrainment of special-status fish species that have been documented to utilize the area. CDFW recommends the IS/MND be revised and recirculated to analyze this potentially significant impact for evaluation as part of the CEQA public disclosure process.

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	<i>CDFW also recommends that the IS/MND be revised to require the Project incorporate and follow CDFW's Fish Screen Policy and Fish Screening Criteria where applicable. Both of which can be found in the California Salmonid Stream Habitat Restoration Manual, available online at https://wildlife.ca.gov/Grants/FRGP/Guidance#580983477guidance-documents.</i> Response: Added text to measure MM-6 to clarify the priority of safe fish rescue and relocation over data collection. Text was also added to the Environmental Setting and Findings subsections to discuss the potential for fish entrainment, which describes that though fish access from Cache Slough into Hastings Cut would not be maintained, new access from Lindsey Slough to Hastings Cut would be provided, and Hastings Cut would continue to be generally accessible to fish. Therefore, entrainment of fish in Hastings Cut is not anticipated from Project implementation. MM-8 includes a measure to cover dewatering temporary pump intakes with 3/32-inch mesh and checked periodically to prevent potential entrainment of fish or other aquatic species; this is consistent with CDFW's Fish Screen Policy and Fish Screening Criteria.
CDFW-9	Comment: <u>Giant Garter Snake Surveys and Habitat Assessment</u> <i>Issue:</i> MM-5 of the IS/MND may not be sufficient to avoid potentially significant impacts to giant garter snake, a state threatened species. Ground disturbing activities and burrow destruction have the potential to result in collapse of giant garter snake refugia and may result in take of giant garter snake if present. MM-5 does not describe how impacts to giant garter snake would be avoided, aside from limiting the work window to the active period for the snake to lessen the likelihood of impacts. <i>Giant garter snake is a highly aquatic snake endemic to the Central Valley of California. The species became threatened several decades ago primarily due to habitat loss from agriculture (Hansen et al, 2015). The species relies on wetland habitats that have been destroyed, fragmented, or degraded by urbanization and agricultural development. Only 5 percent of the species' historic wetland habitat acreage remains. Additionally, giant garter snake are threatened by invasive predatory fish and bullfrogs as well as pesticides, herbicides, fertilizers, and heavy metals, which not only impact giant garter snake directly but are cause declines in their native prey (e.g., Sierran treefrogs and Sacramento blackfish). Water diversions, dams, canal and levee maintenance, and rodent abatement also threaten the species. Plastic erosion control or bird netting can entangle and kill snakes as well (Kapfer and Paloski 2011).</i> <i>Currently, giant garter snake are isolated to only nine disjunct populations. At the time of the species listing in 1993 under the federal Endangered Species Act (ESA), the USFWS (USFWS 2017) recognized 13 populations. Since then, two populations have been determined extirpated (USFWS 2017). In addition, giant garter snake are also susceptible to roads, vehicular traffic, and non-native species impacts (USFWS 2017). Road use can result in snake mortality as they congregate on roads due to the increased temperature that creates a heat island on and near the road for thermoregulation (Trombulak and Frissell 2000). Reptile diversity has been shown to decline relative to the density of roads (Findlay and Houlahan 1997).</i> <i>The species has specific seasonal habitat requirements. During summer months, giant garter snake require aquatic habitat for foraging and</i>

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	adjacent upland areas with emergent vegetation for basking (USFWS 2017). During periods of inactivity, giant garter snake require burrows in upland habitat as refugia for summer shelter and cracks and burrows in uplands for winter estivation (Hansen et al. 2015). <u>Recommendations:</u> To avoid “take” or adverse impacts to giant garter snake, CDFW recommends incorporation of the following mitigation measures into the IS/MND or be required as conditions of approval in permits the Port of Stockton issues for the Project: <u>Recommendation #1: Giant Garter Snake Habitat Assessment</u> CDFW recommends that a qualified biologist conduct a habitat assessment of Project areas in advance of Project activities, to determine if the Project area or its vicinity contains usable habitat for giant garter snake. Due to the presence of giant garter snake habitat on the Project site, CDFW recommends, no more than 30 days prior to ground-disturbing activities, a qualified biologist with giant garter snake experience, survey the work area and a minimum 50-foot radius of the work area for burrows and crevices in which giant garter snake could be present. It is advised that all potentially suitable burrows and crevices be flagged and avoided by a minimum 50-foot no-disturbance buffer. If a 50-foot radius buffer isn’t feasible, consultation with CDFW is warranted to discuss how to implement the Project and avoid take of the species. <u>Recommendation #2: Giant Garter Snake Habitat Buffer</u> If potential aquatic habitat for giant garter snake has been identified in or within 200 feet of the Project area by the qualified biologist, a qualified biologist should be present onsite to monitor all project activities. <u>Recommendation #3: Giant Garter Snake Observation</u> If a snake species of any kind is observed within the Project site, then all Project activities shall halt, and work shall not continue until the snake species is identified by a qualified biologist. If giant garter snake is discovered at any time within the Project site and staging areas, then all Project activities shall halt until CDFW has been notified and the Project proponent can demonstrate compliance with CESA to CDFW’s satisfaction. CDFW reserves the right to provide additional giant garter snake protection measures in the event of a giant garter snake detection. <u>Recommendation #4: Giant Garter Snake Take Prohibition</u> If “take” of giant garter snake or any other species listed under CESA cannot be avoided either during Project activities or over the life of the Project, a CESA Permit should be obtained (pursuant to Fish and Game Code Section 2080 et seq.). Response: Addressed with modifications. MM-5 has been revised to incorporate additional protections and applicable recommendations. There is no Project nexus with the Port of Stockton, and therefore no associated permits or approvals from the Port of Stockton.

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CDFW-10	Comment: <u>Western Pond Turtle</u> <i>Issue:</i> The draft IS/MND, page 30, states “the Project Area contains suitable aquatic habitat for Western pond turtle in Hastings Cut and Lindsey and Cache sloughs. Additionally, the Project Area may be used as upland dispersal between suitable aquatic habitats. A Western pond turtle was observed in Barker Slough, less than 1 mile upstream of the Project Area in 2020”. However, the draft IS/MND does not include specific avoidance and minimization measures addressing western pond turtle. For instance, MM-3 requires a pre-construction survey to address species including western pond turtle, but the measure does not provide species specific parameters. Without appropriate avoidance and minimization measures for western pond turtle, potentially significant impacts associated with Project activities include nest destruction, inadvertent entrapment, reduced reproductive success, reduction in health or vigor of eggs and/or young, and direct mortality. <u>Recommendations:</u> CDFW recommends that the draft IS/MND include a measure requiring a qualified biologist to conduct focused surveys for potential western pond turtle nesting habitat prior to each phase of the Project. If nesting habitat is identified then to exclude any female western pond turtle from laying eggs within a development phase of the Project, exclusion fencing should be placed prior to the egg-laying season (March through August). Exclusion fencing should be designed to encompass each development phase and maintained weekly until construction activities have been completed. Additionally, CDFW recommends that if any western pond turtle are discovered at the site immediately prior to or during Project activities, they should be allowed to move out of the area of their own accord. If a western pond turtle is unable to independently move out of the Project area, a qualified biologist should relocate it out of harm’s way to habitat similar to where it was found. Response: Addressed with modifications. Measure CM-2 specifies that, if any wildlife is observed in the Project footprint, activities within the immediate vicinity will cease and the animal will be allowed to move out of the area on its own; this includes turtles. Measure MM-3 has been updated to focus on western pond turtles (and the species nests) and includes focused surveys prior to the start of activities. If a nest is discovered, a no-disturbance buffer will be implemented.
CDFW-11	Comment: <u>California Tiger Salamander</u> The IS/MND states there is potential for the Project site containing California tiger salamander, but does not include avoidance, minimization, or mitigation measures to address this potential. The Project site is located within the known range for Central Valley DPS California tiger salamander. According to CNDDDB, there are several extant California tiger salamander observations approximately 0.5 to 0.7 miles North of the proposed Project activities (CNDDDB Accessed January 2023). The IS/MND acknowledges there is potentially suitable breeding habitat to the northwest of the site, but states it is marginal due to ponds being scattered in agricultural grazing lands. Agricultural activities often coexist on sites with abundant California tiger salamander populations. Appropriate grazing management practices can be a

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	<i>benefit to the species by reducing dense, tall vegetation around breeding ponds, which allows California tiger salamander to migrate and access breeding habitat more easily. If there is burrow habitat within the open landscape and California tiger salamander inhabits breeding habitat within 1.3 miles of the Project site, the Project site is potentially aestivation habitat. Therefore, the evaluation for California tiger salamander in the IS/MND is inadequate as written and measures should be incorporated to mitigate for impacts.</i> <i><u>Recommendations:</u> Due to the Project location containing appropriate breeding and aestivation habitat and being directly adjacent to a California tiger salamander observation, CDFW advises that the Project proponent obtain a CESA Permit (pursuant to Fish and Game Code Section 2080 et seq.) in advance of Project implementation. Issuance of a CESA Permit is subject to CEQA documentation; therefore, the CEQA document should specify impacts; mitigation, and should fully describe a mitigation, monitoring and reporting program. As mentioned above, if the proposed Project will impact any CESA-listed species, early consultation is encouraged, as significant modification to the Project and mitigation measures may be required in order to obtain a CESA Permit. More information on the CESA Permitting process and protocol survey procedures can be found on the CDFW website at https://www.wildlife.ca.gov/Conservation/CESA or https://www.wildlife.ca.gov/Conservation/Survey-Protocols. CDFW recommends consulting with USFWS to comply with federal ESA requirements.</i> Response: Added text to the Environmental Setting and Findings subsections to clarify the distance of the Project Area from nearest documented sightings, expanded the analysis of potential to occur in the Project Area (including the types of land management activities occurring in adjacent habitats).
California State Lands Commission	
CSLC-1	Comment: <i><u>General Comment - Public Agency Approvals:</u> In the Project Summary (page ii), the Commission was not included in the list of public agencies whose approval is required. The cofferdams included in the project description will be in Commission jurisdiction and will require a lease.</i> Response: The Commission has been added to the list of public agencies whose approval may be required.
Central Valley Regional Water Quality Control Board	
CVRWQCB-1	Comment: <i><u>Regulatory Setting - Basin Plan</u></i> <i>The Central Valley Water Board is required to formulate and adopt Basin Plans for all areas within the Central Valley region under Section 13240 of the Porter-Cologne Water Quality Control Act. Each Basin Plan must contain water quality objectives to ensure the reasonable protection of beneficial uses, as well as a program of implementation for achieving water quality objectives with the Basin Plans. Federal</i>

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	<i>regulations require each state to adopt water quality standards to protect the public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act. In California, the beneficial uses, water quality objectives, and the Antidegradation Policy are the State's water quality standards. Water quality standards are also contained in the National Toxics Rule, 40 CFR Section 131.36, and the California Toxics Rule, 40 CFR Section 131.38.</i> <i>The Basin Plan is subject to modification as necessary, considering applicable laws, policies, technologies, water quality conditions and priorities. The original Basin Plans were adopted in 1975, and have been updated and revised periodically as required, using Basin Plan amendments. Once the Central Valley Water Board has adopted a Basin Plan amendment in noticed public hearings, it must be approved by the State Water Resources Control Board (State Water Board), Office of Administrative Law (OAL) and in some cases, the United States Environmental Protection Agency (USEPA). Basin Plan amendments only become effective after they have been approved by the OAL and in some cases, the USEPA. Every three (3) years, a review of the Basin Plan is completed that assesses the appropriateness of existing standards and evaluates and prioritizes Basin Planning issues. For more information on the Water Quality Control Plan for the Sacramento and San Joaquin River Basins, please visit our website: http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/</i> Response: Comment noted.
CVRWQCB-2	Comment: <u>Regulatory Setting – Antidegradation Considerations</u> <i>All wastewater discharges must comply with the Antidegradation Policy (State Water Board Resolution 68-16) and the Antidegradation Implementation Policy contained in the Basin Plan. The Antidegradation Implementation Policy is available on page 74 at: https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_2018_05.pdf</i> <i>In part it states:</i> <i>Any discharge of waste to high quality waters must apply best practicable treatment or control not only to prevent a condition of pollution or nuisance from occurring, but also to maintain the highest water quality possible consistent with the maximum benefit to the people of the State.</i> <i>This information must be presented as an analysis of the impacts and potential impacts of the discharge on water quality, as measured by background concentrations and applicable water quality objectives.</i> <i>The antidegradation analysis is a mandatory element in the National Pollutant Discharge Elimination System and land discharge Waste Discharge Requirements (WDRs) permitting processes. The environmental review document should evaluate potential impacts to both surface and groundwater quality.</i>

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	Response: Addressed. The IS/MND includes an evaluation of potential impacts to both surface and groundwater quality in the Findings subsection under Section 2.10, <i>Hydrology and Water Quality</i>.
CVRWQCB-3	Comment: <u>Permitting Requirements – Construction Storm Water General Permit</u> <i>Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit), Construction General Permit Order No. 2009-0009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). For more information on the Construction General Permit, visit the State Water Resources Control Board website at: http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml</i> Response: The District plans to contact the Central Valley Regional Water Quality Control Board and prepare a SWPPP.
CVRWQCB-4	Comment: <u>Permitting Requirement – Clean Water Act Section 404 Permit</u> <i>If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed from the United States Army Corps of Engineers (USACE). If a Section 404 permit is required by the USACE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration Permit requirements. If you have any questions regarding the Clean Water Act Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACE at (916) 557-5250.</i> Response: A Clean Water Act Section 404 permit will be obtained.
CVRWQCB-5	Comment: <u>Permitting Requirements - Clean Water Act Section 401 Permit – Water Quality Certification</u> <i>If an USACE permit (e.g., Non-Reporting Nationwide Permit, Nationwide Permit, Letter of Permission, Individual Permit, Regional General Permit, Programmatic General Permit), or any other federal permit (e.g., Section 10 of the Rivers and Harbors Act or Section 9 from the United States Coast Guard), is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. There are no waivers for 401 Water Quality Certifications. For more information on the Water Quality Certification, visit the Central Valley Water</i>

Comment No.	Public Draft IS/MND Comments and Responses
	Board website at: https://www.waterboards.ca.gov/centralvalley/water_issues/water_quality_certification/ Response: A Clean Water Act Section 401 Permit will be obtained.
CVRWQCB-6	Comment: <u>Permitting Requirements - Waste Discharge Requirements – Discharges to Waters of the State</u> <i>If USACE determines that only non-jurisdictional waters of the State (i.e., “nonfederal” waters of the State) are present in the proposed project area, the proposed project may require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation. For more information on the Waste Discharges to Surface Water NPDES Program and WDR processes, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/water_issues/waste_to_surface_water/ Projects involving excavation or fill activities impacting less than 0.2 acre or 400 linear feet of non-jurisdictional waters of the state and projects involving dredging activities impacting less than 50 cubic yards of non-jurisdictional waters of the state may be eligible for coverage under the State Water Resources Control Board Water Quality Order No. 2004-0004-DWQ (General Order 2004-0004). For more information on the General Order 2004-0004, visit the State Water Resources Control Board website at: https://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2004/wqo/wqo2004-0004.pdf</i> Response: The Project Area includes waters of the United States; as such, a Clean Water Act Section 401 permit will be obtained.
CVRWQCB-7	Comment: <u>Permitting Requirements - Dewatering Permit</u> <i>If the proposed project includes construction or groundwater dewatering to be discharged to land, the proponent may apply for coverage under State Water Board General Water Quality Order (Low Threat General Order) 2003-0003 or the Central Valley Water Board’s Waiver of Report of Waste Discharge and Waste Discharge Requirements (Low Threat Waiver) R5-2018-0085. Small temporary construction dewatering projects are projects that discharge groundwater to land from excavation activities or dewatering of underground utility vaults. Dischargers seeking coverage under the General Order or Waiver must file a Notice of Intent with the Central Valley Water Board prior to beginning discharge.</i> <i>For more information regarding the Low Threat General Order and the application process, visit the Central Valley Water Board website at: http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo2003-0003.pdf</i> <i>For more information regarding the Low Threat Waiver and the application process, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/waivers/r5-2018-0085.pdf</i>

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	Response: The District will file a Notice of Intent with the Central Valley Regional Water Quality Control Board prior to dewatering.
CVRWQCB-8	Comment: <u>Permitting Requirements - Limited Threat General NPDES Permit</u> <i>If the proposed project includes construction dewatering and it is necessary to discharge the groundwater to waters of the United States, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. Dewatering discharges are typically considered a low or limited threat to water quality and may be covered under the General Order for Limited Threat Discharges to Surface Water (Limited Threat General Order). A complete Notice of Intent must be submitted to the Central Valley Water Board to obtain coverage under the Limited Threat General Order. For more information regarding the Limited Threat General Order and the application process, visit the Central Valley Water Board website at:</i> <i>https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2016-0076-01.pdf</i> Response: An NPDES permit will be obtained.
CVRWQCB-9	Comment: <u>Permitting Requirements - NPDES Permit</u> <i>If the proposed project discharges waste that could affect the quality of surface waters of the State, other than into a community sewer system, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. A complete Report of Waste Discharge must be submitted with the Central Valley Water Board to obtain a NPDES Permit. For more information regarding the NPDES Permit and the application process, visit the Central Valley Water Board website at:</i> <i>https://www.waterboards.ca.gov/centralvalley/help/permit/.</i> Response: An NPDES permit will be obtained.

Appendix F

Hastings Tract Pipe Replacement Project Mitigation Monitoring and Reporting Program

MAY 2024

Hastings Tract Pipe Replacement Project Mitigation Monitoring and Reporting Program



P R E P A R E D F O R
Reclamation District No. 2060
Hastings Tract
1143 Crane Street, Suite 200
Menlo Park, CA 94025

P R E P A R E D B Y
Stillwater Sciences
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Davis, CA 95618

and

MBK Engineers
455 University Avenue, Suite 100
Sacramento, CA 95825

Suggested citation:

Stillwater Sciences. 2024. Hastings Tract Levee Pipe Replacement Project Mitigation Monitoring and Reporting Program. Prepared by Stillwater Sciences, Davis, California and MBK Engineers, Sacramento, California for Reclamation District No. 2060, Menlo Park, California.

Cover photo: Lindsey Slough from Hastings Tract, June 2023.

1 INTRODUCTION

Hastings Tract’s levees and associated water conveyance infrastructure are maintained by Reclamation District No. 2060 (District). The District is planning to install new twin 48-inch-diameter tide gates (pipes) in the Unit 1 Lindsey Slough levee where they will connect Hastings Cut with Lindsey Slough, and the existing pipes connecting Hastings Cut and Cache Slough through the Unit 3 Cache Slough levee and associated appurtenances will be removed or abandoned in place (Project). The Project has two primary purposes: (1) to improve long-term flood protection of Hastings Tract by replacing aging infrastructure through the levee and (2) to improve water quality and avoid environmental impacts to Cache Slough.

In accordance with the California Environmental Quality Act (CEQA), the District prepared an Initial Study/Mitigated Negative Declaration (IS/MND) that identifies potential environmental effects of the Project. The District is the CEQA lead agency, and the California Department of Water Resources (DWR), California Department of Fish and Wildlife (CDFW), Central Valley Flood Protection Board (CVFPB), Central Valley Regional Water Quality Control Board (CVRWQCB), and California State Lands Commission (if necessary) are the CEQA responsible agencies. The IS/MND identifies mitigation measures that would reduce or eliminate any potentially significant effects.

2 PURPOSE

In accordance with CEQA (California Public Resources Code Section 21081.6, and Section 15074[d] of the CEQA Guidelines), this Mitigation Monitoring and Reporting Program (MMRP) is designed to ensure compliance with the mitigation measures outlined in the Project’s IS/MND. The results of the environmental analyses, including identified conservation and mitigation measures, are documented in the IS/MND (Stillwater Sciences and MBK Engineers 2023). This MMRP identifies the conservation and mitigation measures included in the Project to avoid or minimize potentially significant environmental impacts and includes the monitoring and/or reporting provisions that will be required to ensure proper implementation of these measures.

Table 1 provides a matrix listing the following components of this MMRP:

- Measure: conservation or mitigation measure taken verbatim from the Project’s IS/MND (Stillwater Sciences and MBK Engineers 2024).
- Applicable Resources: the environmental resource(s) protected by each measure.
- Responsible Entity: the entity responsible for implementing each measure.
- Monitoring/Enforcement Entity: the agency, consultant, or other entity responsible for overseeing that mitigation occurs.
- Measure Timing: a general schedule for implementing each measure.
- Action: steps taken to verify implementation of the measures.

Table 1. Conservation and Mitigation Monitoring and Reporting Program for the Hastings Tract Pipe Replacement Project.

Measure	Applicable Resources	Responsible Entity	Monitoring/ Enforcement Entity	Measure Timing	Action
Conservation Measures					
CM-1. The following best management practices (BMPs) will be implemented during Project construction to prevent, control, and minimize emissions: a) All construction vehicles will be model year 2010 or newer. b) All diesel-fueled construction equipment will be in compliance with the California Air Resources Board’s (CARB’s) In-Use Off-Road Diesel-Fueled Fleets Regulation. c) All construction equipment will be properly tuned and maintained prior to and for the duration of on-site operation. d) Diesel-powered construction equipment idling time will be minimized to the extent feasible. e) An operational water truck will be available at all times. Water will be applied as needed to control dust and to prevent visible emissions violations and off-site dust impacts. f) Traffic speeds on all unpaved surfaces will be limited to 20 miles per hour or less. g) Ground cover will be re-established within the Project Area as soon as possible after construction.	Air Quality, Greenhouse Gas Emissions	Primary Construction Contractor	Primary Construction Contractor	Prior to and ongoing during construction	Implement all identified measures and BMPs to minimize emissions during construction
CM-2. If any wildlife is observed in the Project footprint, activities within the immediate vicinity will cease and the animal will be allowed to move out of the area on its own. Prior to beginning Project activities each day or before moving vehicles or equipment, staging areas as well as areas under and around vehicles and equipment will be scanned for wildlife.	Biological Resources	District and Biological Contractor	CDFW	Ongoing during construction	Monitor activities with the potential to affect sensitive biological resources
CM-3. Prior to Project construction, a Stormwater Pollution Prevention Plan (SWPPP) will be developed that will include, but not be limited to, the following BMPs to avoid and minimize potential impacts on waters from erosion: a) Construction will occur only during dry periods. Dry periods are defined as: (1) less than 0.25 inch of precipitation during the preceding 24 hours, and (2) no precipitation falling during active construction. b) Prior to storm events, all construction activities will cease, and appropriate erosion control measures implemented. c) Soil, silt, or other organic materials will not be placed, stockpiled, or stored where such materials could pass into surface water or surface water drainage courses during unexpected rain events. d) All areas disturbed by Project activities will be protected from washout or erosion prior to the onset of the rainy season. e) All temporarily affected areas will be restored to pre-construction contours and conditions upon completion of construction activities. Any areas with bare ground will be re-seeded with a native seed mix. f) Prior to initiation of any waterside work, erosion control measures will be utilized throughout all phases of operation where silt and/or earthen fill threaten to enter waters of the U.S and/or state.	Hydrology and Water Quality, Geology and Soils	Primary Construction Contractor	CVRWQCB	Prior to and ongoing during construction	Implement all identified BMPs such that potential impacts on waters from erosion are avoided or minimized
CM-4. The Project SWPPP will include, but not be limited to, the following BMPs to avoid and minimize potential effects from hazards and hazardous materials: g) No potentially hazardous materials will be stored in a location where there is potential to enter any waterway and/or contaminate aquatic resources. h) All construction materials with the potential to pollute runoff will be handled with care and stored under cover or surrounded by berms during wet weather or when rain is forecast. i) An effort will be made to store only the amount of a potentially hazardous product necessary to complete the job. j) Materials, fuels, liquids and lubricants, and equipment supplies stored on site will be stored in a neat, orderly manner, in their appropriate containers, with the original manufacturer’s label, and, if possible, in an enclosure. k) Machinery stored on site will have pans or absorbent mats placed underneath potential leak areas. l) Any hazardous materials will be stored and labeled according to local, state, and federal regulations. m) If drums must be stored without overhead cover, they will be stored at a slight angle to reduce corrosion and ponding of rainwater on the lids. n) Substances will not be mixed with one another unless recommended by the manufacturer. o) Manufacturer's recommendations for proper use and disposal of a product will be followed. p) Whenever possible, all of a product will be used before disposal of its container. q) If surplus product must be disposed of, the manufacturer’s or the local and state recommended methods for proper disposal will be followed.	Hazards and Hazardous Materials, Hydrology and Water Quality	Primary Construction Contractor	CVRWQCB	Ongoing during construction	Implement all identified BMPs such that potential contaminants are isolated from waterways to the extent practicable and feasible

Measure	Applicable Resources	Responsible Entity	Monitoring/ Enforcement Entity	Measure Timing	Action
CM-5. The SWPPP developed for the Project will include, but not be limited to, the following measures to prevent, control, and minimize impacts from a spill of a hazardous, toxic, or petroleum substance during construction of the Project: a) Minor spills are those that can be controlled by on-site personnel. The following actions will occur upon discovery of a minor spill: ▪ The spread of the spill will be contained. ▪ If the spill occurs on impermeable surfaces, such as any temporary surfaces installed for pollution prevention during construction, it will be cleaned up using “dry” methods (e.g., absorbent materials, cat litter, rags). ▪ If the spill occurs in permeable substrate areas, it will be immediately contained by constructing an earthen dike. The contaminated soil will be excavated and properly disposed of. ▪ If the spill occurs during rain, the impacted area will be covered to avoid runoff, and appropriate cleanup steps will be taken after precipitation has ceased. ▪ All steps taken to report and contain the spill will be recorded. ▪ On-site personnel should not attempt to control major spills until the appropriate and qualified emergency response staff have arrived at the site. Failure to report major spills can result in significant fines and penalties. ▪ If a major spill occurs, the Governor's Office of Emergency Services Warning Center will be notified at (800) 852-7550 in addition to local authorities. ▪ For spills of federal reportable quantities, the National Response Center will also be notified at (800) 424-8802. The federal reportable spill quantity for petroleum products is any oil spill that: (1) violates applicable water quality standards, (2) causes a film or sheen upon or discoloration of a water surface or adjoining shoreline, or (3) causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines. ▪ A written report will be sent to all notified authorities. b) Diesel fuel, oil, gasoline, and lubricants are considered petroleum products. These materials will be handled carefully to minimize their exposure to storm water. The risks in using petroleum products will be reduced by following these steps: ▪ Waste oil and other petroleum products will not be discharged into the ground or other water bodies. ▪ Petroleum products will be stored in tightly sealed containers that are clearly labeled, in a covered area, and in an upland area or within prefabricated spill containment devices, earthen berms, or similar secondary containment features. ▪ On-site vehicles will be monitored daily for fluid leaks and receive regular preventative maintenance to reduce the chance of leakage (e.g., check for and fix fuel oil leaks in construction vehicles on a regular basis). Oil, grease, or other fluids will be washed off at designated wash stations prior to entering the Project Area. ▪ Bulk fuel or lubricating oil dispensers will have a valve that must be held open to allow the flow of fuel into construction vehicles. During fueling operations, the contractor will have personnel present to detect and contain spills. c) The following additional spill control and cleanup practices will be followed: ▪ Spills will be contained and cleaned up immediately after discovery. ▪ Manufacturer's methods for spill cleanup of a material will be followed as described on the material safety data sheets (kept with product containers). ▪ Materials and equipment needed for cleanup procedures will be kept readily available on site, either at an equipment storage facility or on the contractor's trucks. Equipment to be kept on site will include, but not be limited to, brooms, dust pans, shovels, granular absorbents, sand, sawdust, absorbent pads and booms, plastic and metal trash containers, gloves, and goggles. ▪ On-site personnel will be made aware of cleanup procedures, the location of spill cleanup equipment, and proper disposal procedures. ▪ Toxic, hazardous, or petroleum product spills required to be reported by regulations will be documented and a record of the spills will be kept with Project documents. ▪ If a spill occurs that is reportable to the federal, state, or local agencies, the contractor will be responsible for making and recording the reports.	Hazards and Hazardous Materials, Hydrology and Water Quality	Primary Construction Contractor	CVRWQCB	Ongoing during construction	Implement all identified BMPs such that potential contaminants are isolated from waterways to the extent practicable and feasible

Measure	Applicable Resources	Responsible Entity	Monitoring/ Enforcement Entity	Measure Timing	Action
CM-6. The Project SWPPP will include actions to protect water quality in surrounding waterways during in-water work (e.g., installing cofferdams). These actions will include but not be limited to: a) Sediment booms, silt curtains, or other appropriate turbidity control devices will be installed and maintained around in-water work areas not fully enclosed by a sheet pile cofferdam. Turbidity control devices will be inspected regularly, and any sediment removed from them shall be disposed of in designated locations. b) If sediment plumes are visible outside the turbidity control devices or sheet pile cofferdams, turbidity levels will be monitored. If turbidity levels exceed applicable water quality objectives, in-water work will be delayed until adequate turbidity control measures are in place. c) During in-water work, construction equipment will be operated from a barge, from the adjacent levee slopes, or in dewatered areas with a ground protection mat. The amount of time equipment is stationed, working, or traveling in aquatic habitat will be minimized.	Hydrology and Water Quality	Primary Construction Contractor	Primary Construction Contractor, CVRWQCB	Ongoing during construction	Implement all identified BMPs such that potential impacts on waters from erosion are avoided or minimized
CM-7. The following are measures to reduce the potential for fire: a) Smoking will be permitted only in designated smoking areas. b) Every fuel truck will carry a large fire extinguisher with a minimum rating of 40 B:C. c) All flammable materials will be removed from equipment parking and storage areas.	Air Quality, Wildfire	Primary Construction Contractor	Primary Construction Contractor	Ongoing during construction	Implement all identified BMPs such that potential for fire is reduced
Mitigation Measures					
MM-1. All contractors and equipment operators will be provided a Worker Environmental Awareness Program training about the environmental resources of the Project Area, including special-status plants, fish, and wildlife species with potential to occur within the Project Area, and required protection measures. Workers will be informed about the presence, life history, and habitat requirements of all special-status species that may be affected by Project activities. Training will also include information on state and federal laws protecting plants, wildlife, fish, nesting birds, cultural resources, and water quality and the consequences of noncompliance with these laws. This training will be conducted prior to construction activities and will be provided to any new staff/contractors added during the Project.	Biological Resources, Cultural Resources, Hydrology and Water Quality	District and Biological Contractor	CDFW	Prior to construction for each year of Project implementation, and for any new staff or contractors added during Project	Conduct training with sign-in sheets for all construction crew members and equipment operators
MM-2. Prior to construction, special-status plant surveys will be conducted throughout the Project Area in accordance with <i>Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants</i> (USFWS 2000) and <i>Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities</i> (CDFW 2018). Areas with special-status plants will be flagged or otherwise marked (e.g., staked, fenced) for avoidance, including a 10-foot-radius buffer. If work must be conducted within the 10-foot buffer, hand tools will be utilized to the extent possible. A biological monitor will be present during construction activities in areas within a 10-foot buffer of special-status plants to ensure impacts are avoided.	Biological Resources	District and Biological Contractor	CDFW	Prior to any site disturbance. If necessary, ongoing during Project construction and following assessment of affected plants	Pre-construction plant surveys. If necessary, ensure avoidance of special-status plants or develop a Mitigation and Monitoring Plan to mitigate for any effects
MM-3. A preconstruction survey focusing on the presence and distribution of northwestern pond turtles (<i>Actinemys marmorata</i>) and active breeding locations (i.e., nests) will be conducted within the Project footprint and surrounding 300 feet no earlier than 7 days prior to initiation of activities, or if activities in an area have lapsed for more than 14 days. If an active northwestern pond turtle nest (nesting season is typically May through July) is discovered, the area will be noted, and a no-disturbance buffer will be established and flagged. The recommended no-disturbance buffer is 100 feet; however, the buffer will be determined by the biologist (and if needed, in consultation with CDFW) based on environmental conditions and activities being conducted nearby. No Project activities will 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.	Biological Resources	District and Biological Contractor	CDFW	Prior to any site disturbance and ongoing during Project construction, if applicable	Pre-construction surveys for northwestern pond turtles and their nests. If necessary, ensure avoidance of active nests

Measure	Applicable Resources	Responsible Entity	Monitoring/ Enforcement Entity	Measure Timing	Action
MM-4. The following measures will be implemented for Project activities conducted between March 1 and September 15 to minimize impacts on Swainson’s hawk (<i>Buteo swainsoni</i>): a) Survey timing and methodologies will 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 mile of the Project Area up to construction start date. b) As much as feasible, surveys will aim to be conducted during Period II, the early months of the nesting season (March 20 to April 5), to maximize the likelihood of detecting an active nest. c) If active nests are found, a no disturbance buffer of 0.25 mile will be established by a biologist in consideration of surrounding waterways. If Project-related activities need to be conducted within the no disturbance buffer, a biological monitor will oversee the work while monitoring the nest. Work will be allowed if individuals are not exhibiting agitated behavior such as defensive flights at intruders, getting up from a brooding position, or flying off the nest. The biological monitor will have the authority to stop work if the raptors are exhibiting agitated behavior. If the birds are tolerant of Project activities, consultation with CDFW will commence for the reduction of the no disturbance buffer.	Biological Resources	District and Biological Contractor	CDFW	Prior to any site disturbance and ongoing during construction, if applicable	Pre-construction surveys for nesting Swainson’s hawk. If necessary, buffer and monitor active nests
MM-5. The following measures will be implemented to minimize potential impacts on giant garter snake or its habitat. These measures are based on the U.S. Fish and Wildlife Service’s (USFWS’s) <i>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</i> (USFWS 1997), as well as recommendations from CDFW. a) Initial site preparation and initial ground-disturbing activities within 200 feet of suitable giant garter snake habitat will occur between May 1 and October 1; this is the active period for the snake, lessening the potential for direct mortality. After all initial ground-disturbing work has begun within 200 feet of suitable giant garter snake habitat, ongoing work may continue beyond October 1. b) No more than 30 days prior to ground-disturbing activities, a qualified biologist with giant garter snake experience will survey the work area and a minimum 50-foot radius (of the work area) for burrows and crevices in which giant garter snake could be present. It is advised that all potentially suitable burrows and crevices be flagged and avoided by a minimum 50-foot no-disturbance buffer. If a 50-foot radius buffer isn’t feasible, consultation with USFWS and CDFW is warranted to discuss how to implement the Project and avoid take. c) If a snake species of any kind is observed within the Project Area, all Project activities will halt, and work will not continue until the snake species is identified by a qualified biologist. If a giant garter snake is discovered at any time within the Project site and staging areas, then all Project activities will halt until USFWS and CDFW have been notified and the Project complies with ESA and CESA. CDFW may provide additional giant garter snake protection measures in the event of a giant garter snake detection. d) During Project dewatering, potential snake prey (e.g., fish and tadpoles) will be removed to the extent feasible so that snakes are not attracted to the construction footprint. e) The Project will prohibit use of erosion control materials potentially harmful to giant garter snake, such as mono-filament netting; alternatively, tightly woven fiber netting or similar material will be used to ensure that giant garter snakes do not get trapped or become entangled. f) All Project Areas will be surveyed and monitored for giant garter snakes by a qualified biologist during all dewatering and backfilling activities and again if there is a lapse in construction activity of two weeks or more.	Biological Resources	District and Biological Contractor	CDFW, USFWS	Prior to any site disturbance and ongoing during construction	Giant garter snake pre-construction surveys and avoidance measures (e.g., work window, flagging suitable burrows) conducted in accordance with mitigation requirements

Measure	Applicable Resources	Responsible Entity	Monitoring/ Enforcement Entity	Measure Timing	Action
MM-6. Prior to Project activities, a Fish Capture and Relocation Plan will be developed and submitted to the appropriate state and federal wildlife agencies (e.g., CDFW, USFWS, National Marine Fisheries Service [NMFS]) for review and approval. The plan will describe the proposed lead biologist’s qualifications, capture methods, capture and relocation work areas, and reporting requirements, including details in the list below. a) This plan will incorporate the latest USFWS and NMFS guidance relating to the capture and relocation of fish, as applicable. b) To avoid the introduction or spread of aquatic invasive species, procedures for decontamination of any equipment used in the capture and relocation of fish will be identified. c) Prior to the implementation of capture and relocation activities, relocation (or release) sites will be identified by a qualified biologist, based on proximity, access, habitat suitability, and potential to be affected by construction-related disturbance. Suitable habitat for relocation sites will be in the same watershed/subwatershed basin where fish are originally captured. One or more of the following methods will be used to capture protected fish species: electrofishing, dip net, seine, throw net, minnow trap, and hand. d) Fish relocation will only be led by a qualified biologist. The qualified biologist will have knowledge and experience in fish biology and ecology (and the special-status species potentially encountered); fish/habitat relationships; biological monitoring; handling, collecting, and relocating fish; or other relevant experience. e) Residual surface water associated with the diverted or dewatered habitat will be monitored or sampled for the presence of fish by a qualified biologist as soon as the waters are isolated. If a listed species of fish is observed in the isolated habitat, they will be immediately captured and relocated to the suitable habitat outside of the construction area, but in the same water basin, by the qualified biologist, in accordance with the approved fish capture and relocation plan. f) The qualified biologist will relocate any stranded covered fish species to an appropriate place, depending on the life stage of the fish and consistent with the approved rescue and relocation plan. g) The qualified biologist will approximate the number of individuals observed in the affected area, the number of individuals relocated, the approximate size of individuals, the location of capture and release, any instances of injury or mortality, and the date and time of the collection and relocation. These data will be collected secondarily to the safe and efficient fish rescue and relocation effort, where the main goal is to prioritize the capture and release of fish. This information will be reported to the appropriate state and/or federal agencies within seven days of completion of the fish capture and relocation effort.	Biological Resources	District and Biological Contractor	CDFW	Prior to any dewatering activities	Develop and adhere to all measures in a Fish Capture and Relocation Plan such that effects on fish are minimized during fish capture and relocation activities
MM-7. The following actions will be implemented during cofferdam installation and removal to avoid and minimize potential impacts to fish and aquatic wildlife: a) Cofferdam installation will occur during passive tidal outflow, allowing water to drain and fish and wildlife species to leave the area to be enclosed under their own volition, as feasible. b) Cofferdams will enclose the minimum area necessary to perform construction activities. c) If cofferdam installation requires pile driving, vibratory hammers or low/non-impact (i.e., hydraulic) methods will be used. If impact hammers are required, sound dampening or attenuation devices (e.g., cushioning blocks, air bubble curtains) will be utilized. Pile driving will follow criteria outlined in Technical Guidance for Assessment and Mitigation of Hydroacoustic Effects of Pile Driving on Fish (Caltrans 2015). d) Cofferdam footings will be installed to a depth appropriate for impeding the amount of subsurface flow necessary for dewatering the streambed. e) Fine-meshed block nets or screens with openings no wider than 1/8 inch will be utilized during cofferdam installation to ensure fish and aquatic wildlife do not enter areas to be dewatered. The bottom of the nets or screens will be secured to the channel bed, and the nets will be checked at least twice daily and cleaned of debris, as necessary, to permit free flow of water. f) Cofferdams will be removed at the lowest possible tide and in slack water to minimize disturbance. Alteration of the streambed will be minimized, and any imported material that is not part of the Project design will be removed.	Biological Resources	District and Biological Contractor	CDFW	During cofferdam installation and removal	Install and remove cofferdams in a manner that minimizes effects on fish and aquatic wildlife
MM-8. The following actions will be implemented during dewatering to avoid and minimize potential impacts to fish and aquatic wildlife: a) Dewatering equipment will be installed to maintain natural flow in waterways adjacent to (i.e., not enclosed by) cofferdams. b) Dewatering will occur for the minimum amount of time required to perform construction activities in the isolated areas. c) Dewatering pump intakes will be covered with 3/32-inch mesh and checked periodically to prevent potential entrainment of fish or other aquatic species (e.g., northwestern pond turtles).	Biological Resources	District and Biological Contractor	CDFW	During dewatering stage of construction	Implement all identified BMPs during dewatering such that effects on aquatic biological resources are minimized

Measure	Applicable Resources	Responsible Entity	Monitoring/ Enforcement Entity	Measure Timing	Action
MM-9. Construction work will take place outside the February 15 to September 15 bird nesting seasonal window to the maximum extent practicable. If construction is conducted during the nesting season, a biologist will conduct one focused pre-construction nesting bird survey throughout the Project Area no more than five days prior to the initiation of Project activities. The survey will be conducted in all potential habitat located in the Project Area and the minimum survey radii surrounding the Project Area. The minimum survey radii surrounding the work Project Area will be 250 feet for passerines and 1,000 feet for raptors such as <i>Buteo</i> spp. If there is a lapse in construction activities for seven days or more during the nesting season, a biologist will conduct an additional focused pre-construction nesting bird survey in areas of potential habitat again before Project activities can be reinitiated. If an active nest is found, a no-disturbance “Active Nest Buffer” will be established around the nest. The biologist may consult with CDFW, if needed, regarding appropriate action to comply with Fish and Game Code. a) Active Nest Buffers. Active nest sites and protective buffer zones will be designated as “ecologically sensitive areas” where no Project activities may occur or personnel may enter (while occupied or “active”) during the course of nesting bird season with the establishment of a fence barrier or flagging surrounding the nest site, if needed. The qualified biologist will determine the necessary buffer, in consultation with CDFW if needed, to protect nesting birds based on existing site conditions, such as construction activity, topography, and line of sight, and will increase buffers as needed to provide sufficient protection of nesting birds and their natural behaviors. b) Active Nests. If work needs to be conducted within an active nest buffer, a qualified biologist will monitor the nest to detect any signs of disturbance and behavioral changes as a result of the Project. If signs of disturbance and behavioral changes are observed, the qualified biologist will halt Project activities causing that change until the nestlings have fledged, and the nest is determined to be inactive.	Biological Resources	District and Biological Contractor	CDFW	Prior to any site disturbance and ongoing during construction, if applicable	Pre-construction nesting bird surveys. If necessary, buffers and monitoring in accordance with mitigation requirements
MM-10. Western burrowing owl (<i>Athene cunicularia hypugaea</i>) could occur in or near the work area. No more than 14 days prior to the start of construction, a biologist will conduct a pre-construction survey for active burrowing owl burrows using methods recommended by CDFW in the <i>Staff Report on Burrowing Owl Mitigation</i> (CDFW 2012). Occupied habitat includes areas burrowing owls may use for breeding/nesting (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 feet (as recommended in the <i>Staff Report on Burrowing Owl Mitigation</i>) will be established by a biologist in consideration of surrounding waterways. Project-related activities necessary within the buffer will be monitored by a qualified biologist to ensure the owls are not detrimentally affected by Project construction. The on-site biologist will have the authority to stop work if the owls are exhibiting agitated behavior.	Biological Resources	District and Biological Contractor	CDFW	Prior to any site disturbance and ongoing during construction, if applicable	Pre-construction burrowing owl surveys. If necessary, buffers and monitoring in accordance with mitigation requirements
MM-11. Call-back/response surveys for California black rail will be performed by a qualified biologist using the most up-to-date methodologies in areas of suitable rail habitat within 700 feet of the Project Area. If an active breeding location is identified during surveys, a 700-foot no-disturbance buffer will be implemented for the duration of the rail breeding season. If work must occur within the no-disturbance buffer, a biological monitor will be on site for all activities and will stop work if the breeding rails are showing signs of distress (e.g., distress vocalizations, flying away from the nest location).	Biological Resources	District and Biological Contractor	CDFW	Prior to any site disturbance and ongoing during construction, if applicable	Pre-construction black rail surveys. If necessary, buffers and monitoring in accordance with mitigation requirements
MM-12. A preconstruction survey for special-status bumble bees (<i>Bombus</i> spp.) and their nests will be conducted no more than 7 days in advance of construction activities within the Project Area. If an active bumble bee nest is identified, a 25-foot no-disturbance buffer will be established and will remain in place until the biologist is able to determine the nest is no longer active.	Biological Resources	District and Biological Contractor	CDFW	Prior to any site disturbance and ongoing during construction, if applicable	Pre-construction bumble bee surveys and, if necessary, buffers in accordance with mitigation requirements

3 REFERENCES

Caltrans (California Department of Transportation). 2015. Technical Guidance Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish. Report No. CTHWANP-RT-15-306.01.01.

CDFW (California Department of Fish and Wildlife). 2012. Staff Report on Burrowing Owl Mitigation. State of California Natural Resources Agency, Department of Fish and Game. March 7, 2012.

CDFW. 2018. Protocols for surveying and evaluating impacts to special status native plant populations and sensitive natural communities. California Natural Resources Agency, Sacramento, California. Available at:
<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18959&inline>.

Stillwater Sciences and MBK Engineers. 2024. Final Initial Study/Mitigated Negative Declaration for the Hastings Tract Pipe Replacement Project. Prepared by Stillwater Sciences, Davis, California and MBK Engineers, Sacramento, California for Reclamation District No. 2060, Menlo Park, California.

Swainson's Hawk Technical Advisory Committee. 2000. Swainson's Hawk Technical Advisory Committee's Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley. Available at https://www.wildlife.ca.gov/Conservation/Survey-Protocols#377281284-birds_.

USFWS (United States Fish and Wildlife Service). 2000. Guidelines for conducting and reporting botanical inventories for federally listed, proposed and candidate plants.