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INITIAL STUDY/
MITIGATED NEGATIVE DECLARATION

Phases 2 and 3 of Ardenwood Creek (Zone 5 Line P) Flood Control Channel Improvement Project Fremont, California

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

Flood Control & Water Conservation DISTRICT

September 19, 2022

DRAFT

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Phases 2 and 3 of Ardenwood Creek(Zone 5 Line P) Flood Control Channel Improvement Project Fremont, California

Submitted to:

Alameda County Flood Control and Water Conservation District

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TABLE OF CONTENTS

Figures

Tables

Appendices

LIST OF ABBREVIATIONS AND ACRONYMS

ABAG/MTC	Association of Bay Area Government/ Metropolitan Transportation Commission
ACFCWCD	Alameda County Flood Control and Water Conservation District
ACRP	Alameda Creek Recapture Project
ACWD	Alameda County Water District
ATCM	Airborne Toxic Control Measure
BAAQMD	Bay Area Air Quality Management District
BCDC	Bay Conservation and Development Commission
BMPs	Best Management Practices
CAA	Clean Air Act
CACI	Clean Air Communities Initiative
CAP	Climate Action Plan
CARB	California Air Resources Board
CARE	Community Air Risk Evaluation
CDFW	California Department of Fish and Wildlife
CDRP	Calaveras Dam Replacement Project
CEQA	California Environmental Quality Act
CFGC	California Fish and Game Code
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CWA	Clean Water Act
DISTRICT	Alameda County Flood Control and Water Conservation District
DWR	California Department of Water Resources
EA	Environmental Assessment
EBRPD	East Bay Regional Park District
IS	Initial Study
ECB	Erosion Control Blanket
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Environmentally Sensitive Area
FCAA	Federal Clean Air Act
FCAAA	Federal Clean Air Act Amendments
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FONSI	Finding of No significant Impact
GHG	Greenhouse Gas
HDP	Heritage Documentation Programs
HMMP	Habitat Mitigation and Monitoring Plan
LOS	Level of Service
MBTA	Migratory Bird Treaty Act
MLD	Most Likely Descendent
MND	Mitigated Negative Declaration

MOU	Memorandum of Understanding
MMRP	Mitigation, Monitoring and Reporting Program
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places
ODS	Oliver de Silva
OPR	Governor's Office of Planning and Research
PLC	Programmable Logic Controller
PIT	Tag Passive Integrated Transponder Tag
PM	Particulate Matter
PRBO	Point Reyes Bird Observatory
REAP	Rainfall Event Action Plan
SFRWQCB	San Francisco Regional Water Quality Control Board
SFPUC	San Francisco Public Utilities Commission
SHPO	State Historic Preservation Officer

1.0 PROJECT INFORMATION

Project Title:

Phases 2 and 3 of Ardenwood Creek the (Zone 5 Line P) (Line P or Ardenwood Creek) Flood Control Channel Improvement and Restoration Project Fremont, California

Contact Person and Phone Number:

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Project Location:

The proposed project is located west of Paseo Padre Parkway, north and south of Patterson Ranch Road within Coyote Hills Regional Park in the City of Fremont (**Figure 1A**).

Project Sponsor's Name and Address:

Alameda County Flood Control and Water Conservation District
399 Elmhurst St
Hayward, CA 94544

General Plan Designation:

City of Fremont RCP (Open Space – Resource Conservation/Public)

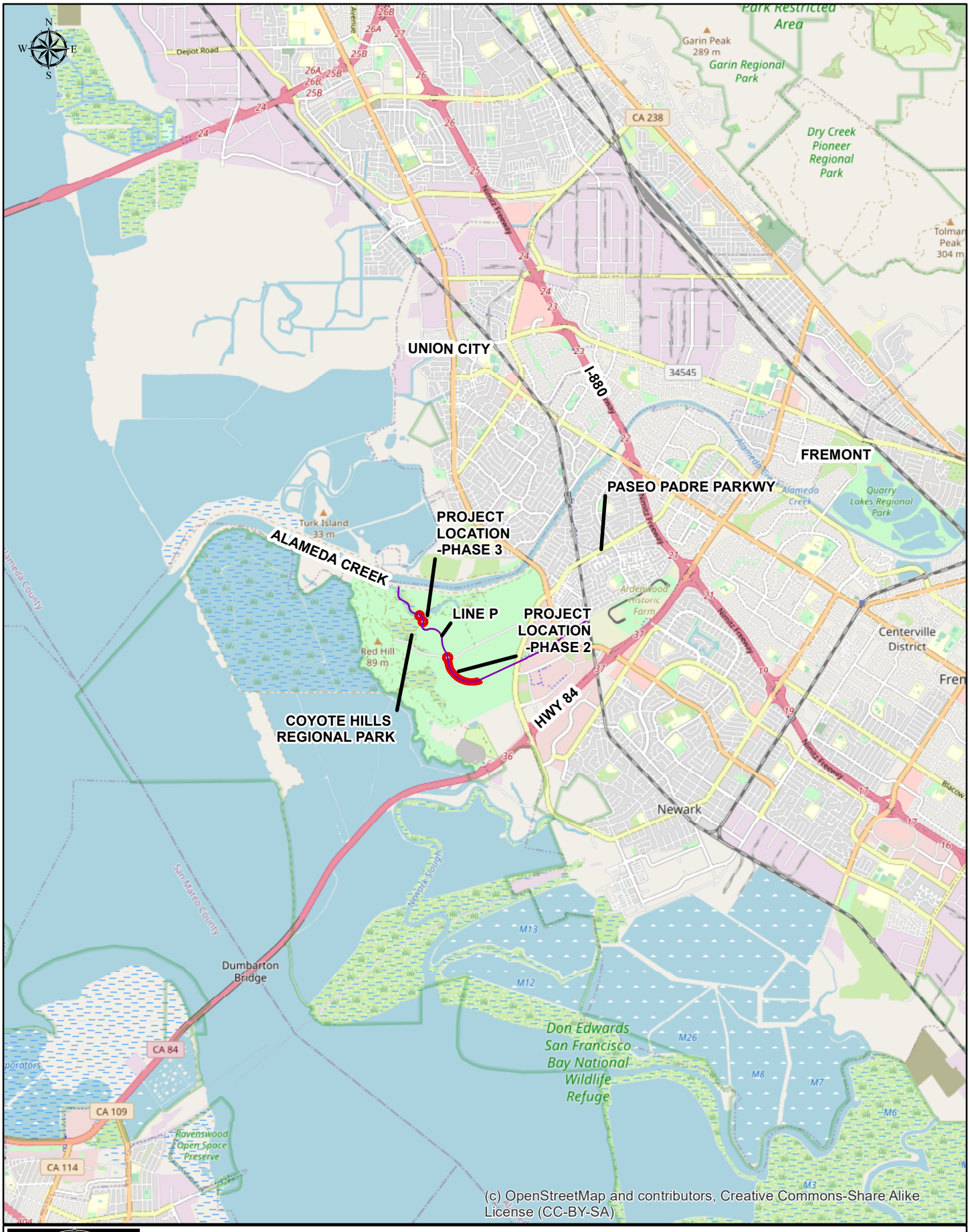
Zoning:

City of Fremont O-S (Open Space)

Description of Project:

Background and Project Summary

The current Ardenwood Creek (Zone 5 Line P) earthen channel was constructed by Kaiser Development Company in 1985 as a part of a residential and commercial development project located east of Paseo Padre Parkway. This drainage facility is now owned, operated and maintained by Alameda County Flood Control and Water Conservation District (ACFCWCD or District). The project area is in the southwestern part of the City of Fremont (**Figure 1A**). The constructed channel



Alameda County Flood Control & Water Conservation District

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FIGURE 1A

LOCATION MAP

ARDENWOOD CREEK

extends from west of I-880 at Tupelo Street above Ardenwood Boulevard west to Alameda Creek, about 2.65 miles in length.

Ardenwood Creek drains urban and suburban areas of western Fremont to a complex of marshes at the foot of the Coyote Hills before flowing through a series of one-way tide gates to Alameda Creek. This area is sometimes also called the "J Ponds" as the constructed channel makes a wide arcing turn from its generally westward course in the form of a large "J," before turning north towards Alameda Creek. These marshes and open water ponds serve as a large, temporary floodwater detention area, storing floodwater before release to Alameda creek when flood flows in this large flood control channel drop, allowing release of the stored water. The cattail marsh areas and ponds also provide significant brackish water wetlands habitat for a large number of waterfowl and over-wintering migratory birds.

Since its construction, the channel has undergone significant sediment deposition with some bank erosion. In addition, cattails have aggressively colonized in portions of the area, forming dense brackish marsh areas that have further reduced flow capacity to below the as-built design condition. Because of this deterioration in flow capacity, flooding and drainage problems have occurred in developed areas east of Paseo Padre Parkway. Prior to completion of Phase 1 channel improvement work, in upstream areas near Paseo Padre Parkway in 2019 and 2020, the channel was last maintained in 2003, when some cattails and sediment blocking areas of the channel downstream of Paseo Padre Parkway were removed.

As part of a settlement agreement with the affected property owners and their representatives for developed watershed areas experiencing damage, and as approved by the Alameda County Board of Supervisors (Board) on June 24, 2014, ACFCWCD agreed to restore the flood control capacity of Ardenwood Creek between Tupelo Street and 2,000 feet downstream of Paseo Padre Parkway, to Patterson Ranch Road. The settlement agreement also includes habitat enhancement along the channel.

As noted earlier, Phase 1, proximate to Paseo Padre, has been completed. The proposed new work would be constructed in two additional phases as follows: 1) Phase2 would restore positive drainage to the earth channel by desilting approximately 2,600 LF section from Patterson Ranch Road to 0.4 mile downstream of Paseo Padre Parkway; and 2) Phase 3, in 2024 or after, would remove the deteriorating culverts at Patterson Pass Road and the adjacent Tuibun Trail, the Chochenyo trail crossing, and replace the D.U.S.T. Marsh trail crossing with new bridges.

The Phase 2 and 3 Project Area is owned and maintained by the District but leased to East Bay Regional Park District (EBRPD), which manages the land for recreation, wildlife, and open space uses. It is managed as a part of the larger Coyote Hills Regional Park, and the Project area includes several hiking trails and visitor serving facilities. The project is in the City of Fremont, Alameda County, California. Project limits of work (**Figure 1B**) and Overview (**Figure 2)** illustrate the project components.

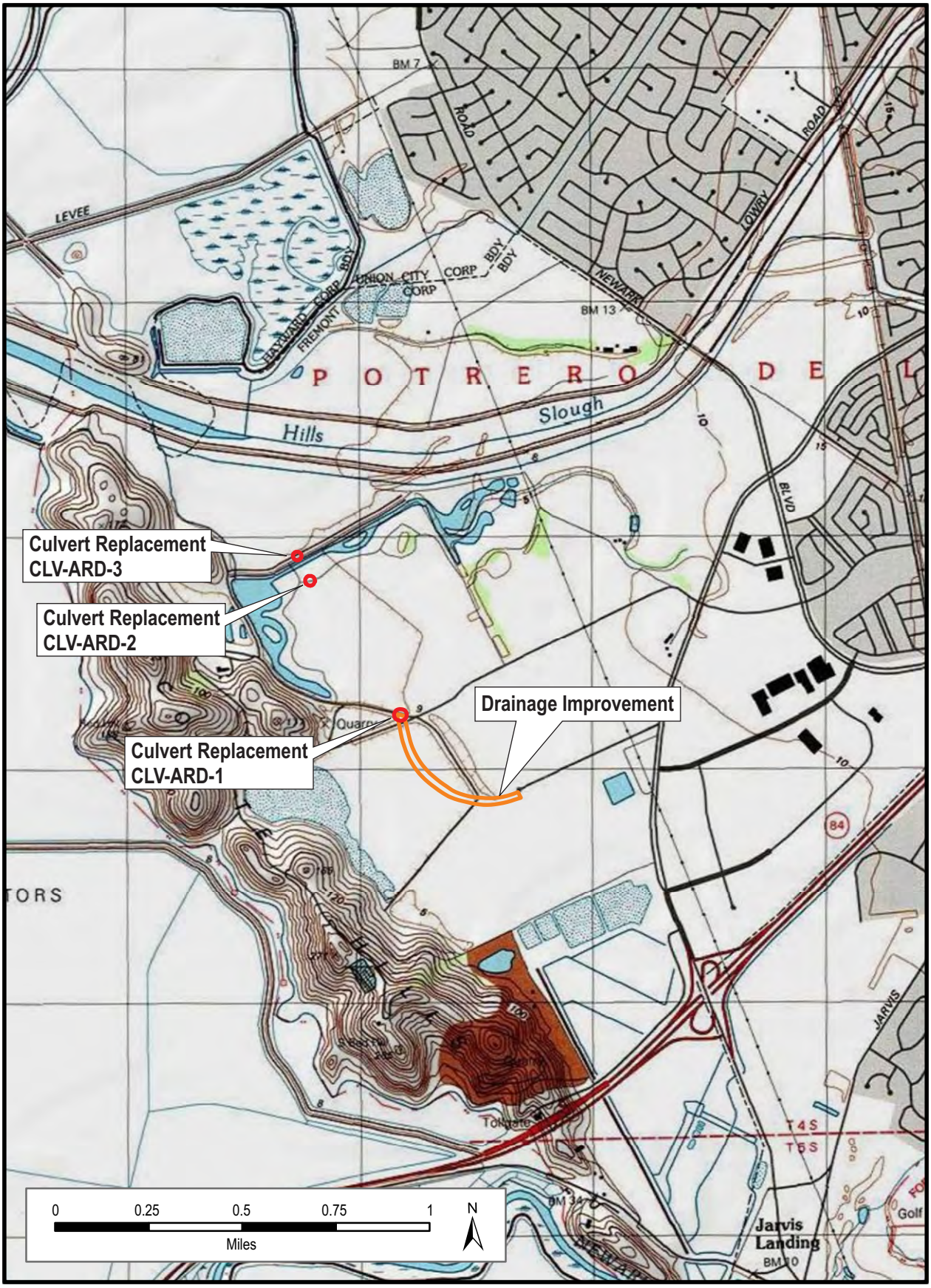

FIGURE 1B
PROJECT LIMITS

Location T4S R2W unsectioned (USGS Newark, CA 1997)

FIGURE 2

PROJECT OVERVIEW

ARDENWOOD CREEK

Purpose and Need

The purpose of the project is to improve hydraulic conveyance of the channel to meet Federal Emergency Management Agency (FEMA) flood protection standards. The project would be constructed in three phases and Phase 1 has already been completed. Phase 2 would restore positive drainage to the earth channel by removing sediment from an approximately 2,600 LF section of the Ardenwood Creek flood control channel from 0.4 mile downstream of Paseo Padre Parkway to the Patterson Ranch Road crossing. Phase 3 would remove deteriorating culverts further downstream at Patterson Ranch Road and the adjacent Tuibun Trail, the Chochenyo trail crossing, and the Demonstration Urban Stormwater Treatment (D.U.S.T.) Marsh trail crossing and replace them with clear span prefabricated bridges supported by abutments placed beyond the top of bank. The bridge foundations would be protected from scour by rock placed on the creek bank.

One of the Project objectives is to reduce the slow spread of the cattail marsh and encourage more desirable seasonal wetlands occupied by pickleweed and other desirable native plant species. The Project would accomplish this by helping to manage the high groundwater table through the deepened and positively drained Ardenwood Creek channel invert, and by removing cattails in the overbank area used for truck haulage of channel spoil. The replacement of the culverts, which restrict drainage, by clear span bridges, would also be beneficial by improving passage of flood flows, and creating new jurisdictional wetland and open water areas. Culvert to clear span bridge conversion would also help control the unwanted spread of cattails in wet and ponded areas.

Phase 2 is planned for construction in the summer or fall of 2023, pending receipt of all regulatory permits. Phase 3 is planned for construction in 2024 or later, pending funding availability and separate permit acquisition. Construction may extend over two or more seasons depending on regulatory requirements and seasonal work windows. Site plans for proposed Phase 2 and Phase 3 construction work are provided in **Figures 2A** and **2B.**

Channel Excavation Work - Phase 2

The Phase 2 project includes channel excavation work south of Patterson Ranch Road. The Limits of Work in this area would be defined by the placement of Environmentally Significant Area (ESA) fencing. An ESA fence specifically designed to prevent the state and federally protected salt marsh harvest mouse from entering work areas would be installed at the Limits of construction work under the direction of a Qualified Biologist (QB). A zone cleared of vegetation that ranges from about 75 to 85 feet in width and averages about 80 feet wide would be created under the direction of the QB along the 2,600LF (both sides of the channel) channel work section. Approximately 1,000 LF additional ESA fence would be installed along the south side of the channel within the Phase I area where temporary mobilization and a bermed area for channel sediment drying and Baker tank placement would occur. **Figures 2C and 2D** depict the proposed dewatering structures and site protection measures , including coffer dams and turbidity curtains used to control sediment, and the proposed ESA fencing that would prevent the California and Federal Endangered Species -Salt Marsh Harvest Mouse (SMHM)- from entering the work areas.

Channel excavation would occur within a 25- to 30-foot wide low flow channel corridor in the approximate center of the ESA cleared zone. Excavation depth would be about 1.5 to 2.5 feet with

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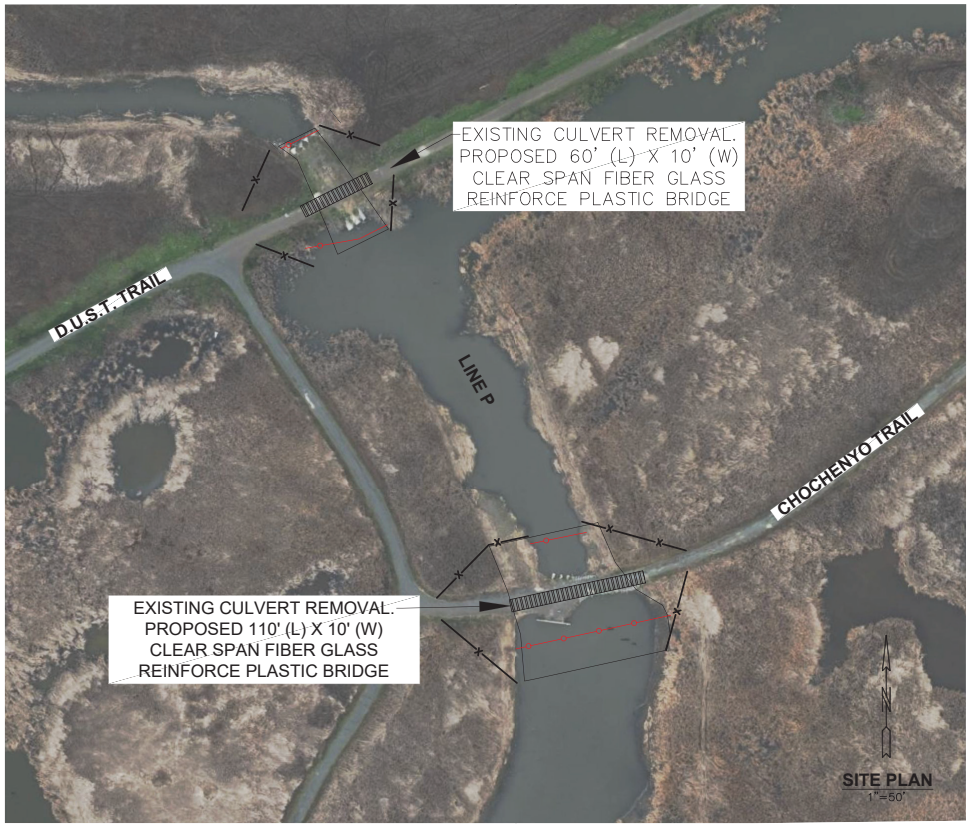
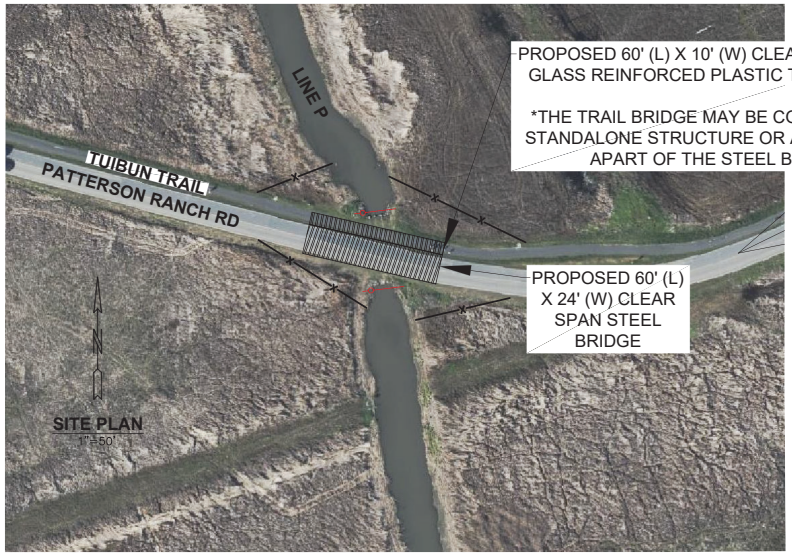
FIGURE 2A

SITE PLAN - PHASE 2&3

ARDENWOOD CREEK





LEGEND:

TURBIDITY CURTAIN (SEE DETAIL IN FIGURE 2C)

EXCLUSIONARY FENCE

BRIDGE CONSTRUCTION SEQUENCE

1. QUALIFIED BIOLOGIST (QB) CONDUCTS PRE-CONSTRUCTION BIOLOGICAL SURVEY AND WORKER ENVIRONMENTAL TRAINING.
2. CLEAR VEGETATION AND INSTALL ESA FENCING AND INSTALL TURBIDITY CURTAINS UP-STREAM AND DOWNSTREAM OF EXISTING CULVERTS, UNDER DIRECTION OF QB. BLOCK CULVERTS AS NEEDED AND AS DETERMINED BY ENGINEER IN CONSULTATION WITH QB.
3. CONSTRUCT NEW BRIDGE FOUNDATIONS ON UPLANDS ADJACENT TO TOP OF CREEK/SLOUGH BANK. WORK ONLY BEHIND ESA FENCING UNLESS OTHERWISE AUTHORIZED BY QB.
4. REMOVE CULVERTS UNDER DIRECTION OF QB. MONITOR TURBIDITY AND HALT WORK AND INSTALL TEMPORARY COFFER DAMS OR BARRIERS IF EXCESSIVE TURBIDITY OCCURS.
5. INSTALL PRE-FABRICATED BRIDGE ON FOUNDATIONS AND REMOVE ESA FENCING. RESTORE AND RE-SEED DISTURBED AREAS ADJACENT TO CULVERT-TO-BRIDGE REPLACEMENT WORK AREA.

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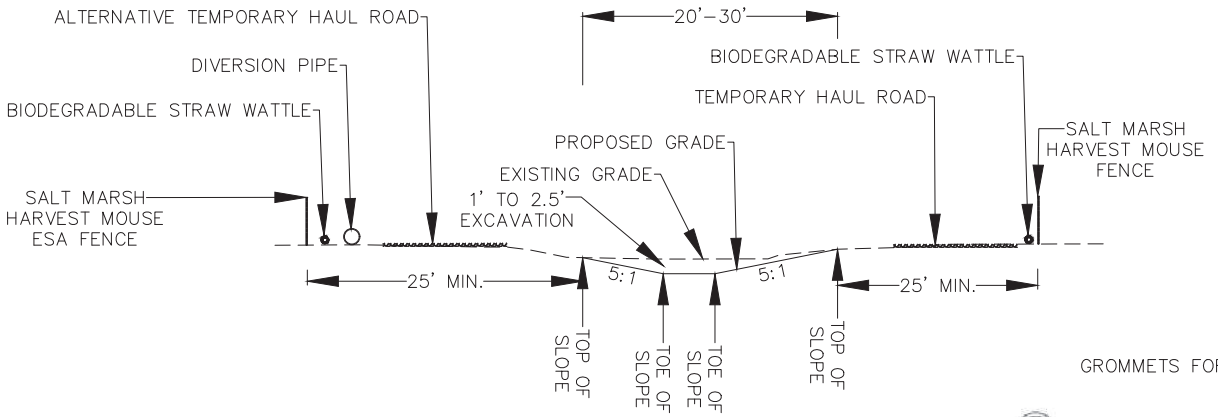
FIGURE 2B

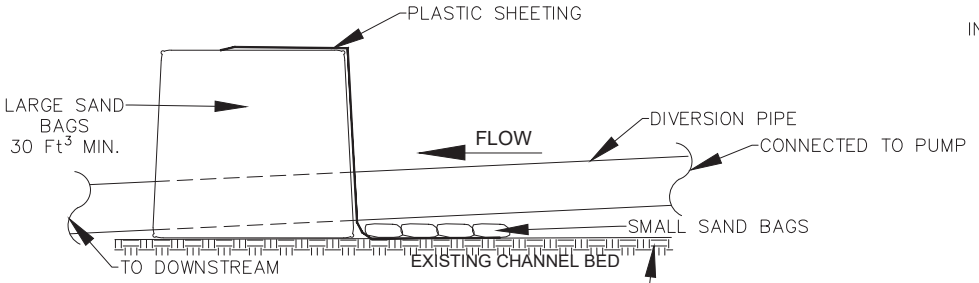
SITE PLAN - PHASE 3 (BRIDGE)

ARDENWOOD CREEK

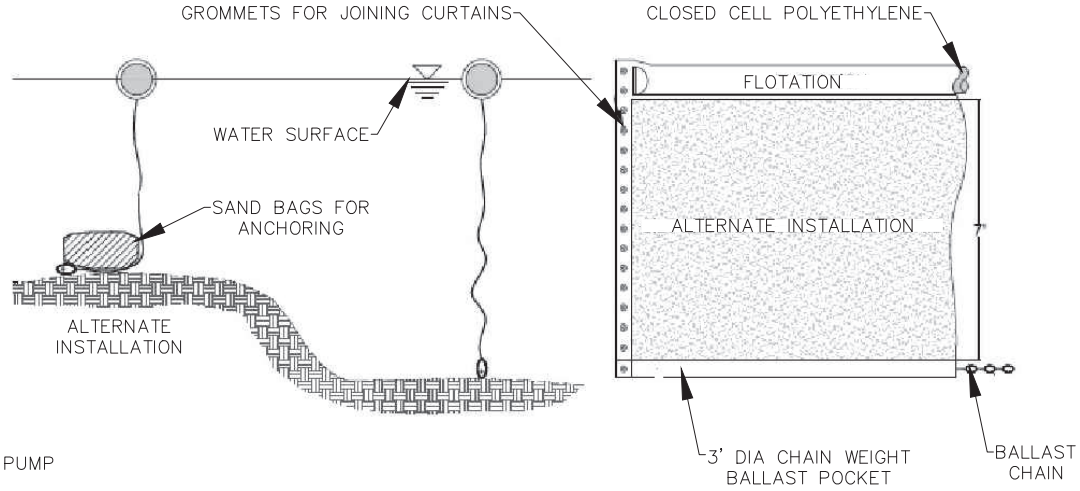


TYPICAL CHANNEL CROSS SECTION 1 / - NTS

1. WORK IN CREEK SHALL BE PLANNED TO MINIMUZE THE NUMBER OF DAYS OF DISTURBANCE.
2. THE CONTRACTOR IS TO OBSERVE THE LOCAL WEATHER FORECASTS AND NOT BEGIN WORK IN THE CREEK UNLESS AT LEAST THREE DAYS WITHOUT RAIN IS ANTICIPATED.
3. ALL DISTURBED CREEK BED AND BANKS ARE TO BE STABILIZED PRIOR TO THE END OF EACH WORK DAY.



COFFER DAM 2 / - NTS



FLOATING SILT CURTAIN SHALL BE A "LAYFIELD FSC 13" OR APPROVED EQUAL. THE BODY OF THE FLOATING SILT CURTAIN IS MADE FROM A STRONG, HIGH FILTRATION FABRIC THAT RETAINS FINE SILTS AND SEDIMENTS ON-SITE. THE FLOAT AND BOTTOM SLEEVE ARE CONSTRUCTED FROM A UV-STABLE, HIGH-STRENGTH POLYETHYLENE (I.E.RIPSTOP-TYPE MATERIAL). THE FLOATING SILT CURTAIN IS INCREASED IN LENGTH BY JOINING ADDITIONAL SECTION OF CURTAIN, WHICH TYPICALLY COMES IN 50' LENGTHS.

TURBIDITY CURTAIN 3 / - NTS

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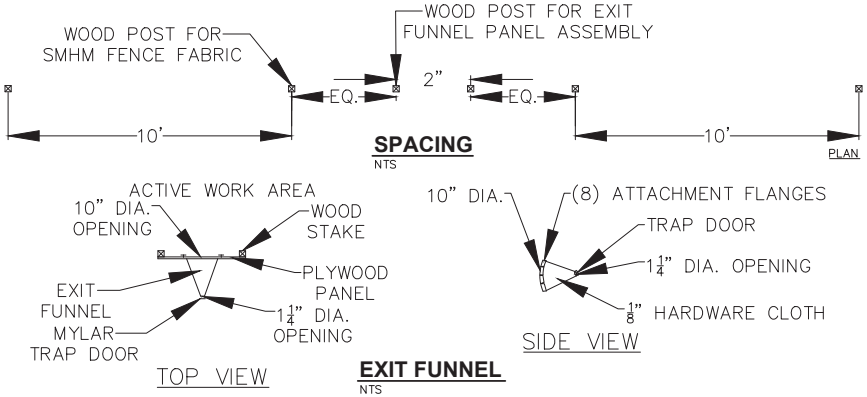
FIGURE 2C
CONSTRUCTION DETAILS
ARDENWOOD CREEK



SPACING
NTS

EXIT FUNNEL
NTS

NOTES

1.0 GENERAL

1.1 THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT BIOLOGIST TO STAKE THE NEW SALT MARSH HARVEST MOUSE EXCLUSION FENCE LAYOUT AS SHOWN IN THE PLANS. THE EXCLUSION FENCE SHALL PROVIDE A BARRIER BETWEEN SALT MARSH HARVEST MOUSE HABITAT AND THE WORK AREA WHERE EARTHWORK ACTIVITIES OCCUR AT ALL TIMES UNLESS OTHERWISE DIRECTED BY THE PROJECT BIOLOGIST. THE PROJECT BIOLOGIST WILL INSPECT THE EXCLUSION FENCE PRIOR TO THE START OF DAILY WORK DURING EARTHWORK ACTIVITIES TO ENSURE THAT THE FENCE DOES NOT HAVE HOLES AND THAT THE BASE IS BURIED. THE EXCLUSION FENCE SHALL BE TEMPORARILY REMOVED AT THE ROAD CROSSING LOCATION AS NEEDED TO ALLOW TRAFFIC IN AND OUT OF THE WORK AREA.

1.2 CONTRACTOR RESPONSIBLE FOR MAINTENANCE OF EXISTING SMHM FENCE AND NEW FENCE THROUGH THE COMPLETION OF CONSTRUCTION AND REMOVAL AND DISPOSAL OF FENCE UPON COMPLETION.

1.3 SUBMITTALS
A. MANUFACTURER'S SPECIFICATIONS AND ADVERTISED MATERIAL FOR SMHM FENCE PLASTIC SHEETING
B. SLICK TAPE FOR TOP OF FENCE – POLYKEN 6"X50' FLASHBAND; 626–35 ALU OR EQUAL

1.4 QUALITY ASSURANCE

A. ACCEPTANCE CRITERION FOR MATERIALS AND WORKMANSHIP: THE ENGINEER SHALL INSPECT ALL MATERIALS AND WORKMANSHIP FOR COMPLIANCE WITH THE PLANS AND SPECIFICATIONS. ACCEPTANCE OF ALL MATERIALS AND WORKMANSHIP IS AT THE DISCRETION OF THE ENGINEER.

2.0 PRODUCTS

A. SMHM FENCE MATERIAL: THE PLASTIC SHEETING MATERIAL FOR THE FENCE SHALL BE BLACK 4 MIL PLASTIC SHEETING.
B. WOODEN STAKES: THE STAKES FOR THE SMHM FENCE SHALL BE 2X2 WOODEN STAKES AS SHOWN IN THE DETAILS.
C. STAPLES: STAPLES USED TO ATTACH THE SILT FENCE FABRIC TO THE STAKES AND EXIT FUNNELS TO THE PANELS SHALL NOT BE LESS THAN ONE AND THREE QUARTERS (1–3/4) INCHES AND SHALL BE FABRICATED FROM 14–GAUGE WIRE.
D. EXIT FUNNEL: SHALL BE MADE OF 1/8 INCH HARDWARE CLOTH.
E. WIRE: SHALL BE 16–GAUGE GALVANIZED WIRE.
F. EXIT FUNNEL TRAP DOOR: SHALL BE MADE OF MYLAR. (SEE 3.E BELOW)
G. SLICK TAPE – POLYKEN 6"X50' FLASHBAND; 626–35 QLU OR EQUAL

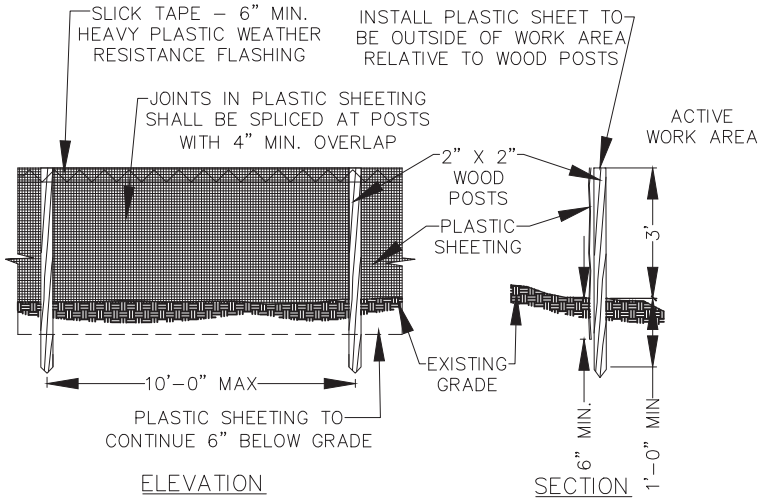
3.0 INSTALLATION

A. INSTALL SMHM FENCE: SMHM FENCE SHALL FORM A PERIMETER AROUND THE ACTIVE WORK AREA. THE SEQUENCE OR PHASING OF FENCE INSTALLATION SHALL BE AS DIRECTED BY THE BIOLOGICAL CONSULTANT. THE FENCE SHALL BE INSTALLED AS SHOWN ON PLANS AND DETAILS; ANY CHANGES OR NEW AREAS OF WORK SHALL ALSO BE PROTECTED. THE PLASTIC SHEETING SHALL BE SECURED TO EACH STAKE WITH FOUR (4) STAPLES. THE STAKES SHALL BE ON THE CONSTRUCTION SIDE OF THE FENCE. NATIVE FILL FOR TRENCH BACKFILL SHALL BE TAMPED AND BACKFILL SHALL MATCH EXISTING GRADE ELEVATION.

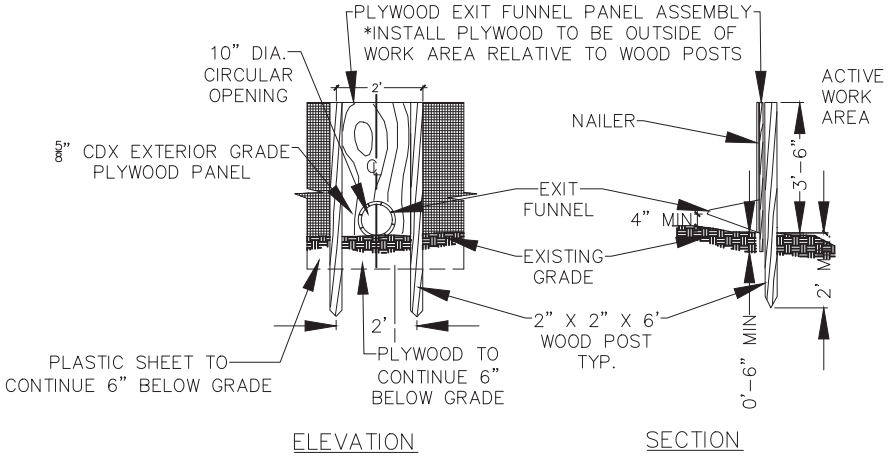
B. INSTALL EXIT PANEL ASSEMBLIES: EXIT FUNNEL PANEL ASSEMBLY SHALL BE FABRICATED AS SHOWN IN THE DETAILS.

C. ONE EXIT FUNNEL PANEL ASSEMBLY SHALL BE INSTALLED EVERY 1,000 LINEAR FEET OF SMHM FENCE.

D. EXIT FUNNELS SHALL BE CONSTRUCTED BY ROLLING HARDWARE CLOTH INTO A CONE SHAPE WITH SPECIFIED END DIAMETERS AND CLOSING WITH TWISTED WIRE. EXIT FUNNEL ATTACHMENT FLAPS SHALL BE ATTACHED TO THE PANEL WITH STAPLES. A MYLAR TRAP DOOR SHALL BE CUT TO COVER ENTIRE OPENING OF SMALLER END. THE TRAP DOOR SHALL BE INSTALLED ON THE OPEN SPACE SIDE OF THE FUNNEL AND ATTACHED WITH ONE WIRE AT THE TOP. E. INSTALL SLICK TAPE ALONG TOP OF FABRIC.



TYPICAL SALT MARSH HARVEST MOUSE ESA FENCE
NTS



EXIT FUNNEL AT SALT MARSH HARVEST MOUSE ESA FENCE
NTS

Alameda County Flood Control & Water Conservation District

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FIGURE 2D
SMHM ESA FENCE
ARDENWOOD CREEK

the newly graded channel having typical 5:1 side slope. A zone approximately 25 feet wide outside of the channel excavation work would be cleared of vegetation on both sides of the channel and the ESA SMMH fencing placed on the outside of this cleared zone. This zone would allow excavator and off-haul trucking access for the channel work, with all construction equipment strictly limited to this zone. Typical, illustrated cross sections showing the proposed channel work are presented in **Figures 3**, **4A** and **4B.**

Because of the impossibility of completely dewatering the channel in this area of high groundwater, nearly all of the channel excavation work would occur within an area of existing open water during the summer months (excavation would occur in shallow water standing in the channel bottom). Approximately 2,400 cubic yards of channel sediment would be excavated and hauled off. Disturbed and erosion prone areas would be restored using erosion control blankets (where needed) and seeded with a native plant mix. In this area, nearly all of the excavation would occur in the existing open water channel, with work conducted after partial channel dewatering, achieved mostly by controlling inflow and downstream backflow water volumes. To avoid nesting bird conflicts, the channel clearing work and excavation work would occur outside of the nesting bird window, on or after September 1st and prior to February 1st.

Culvert Replacement - Phase 3

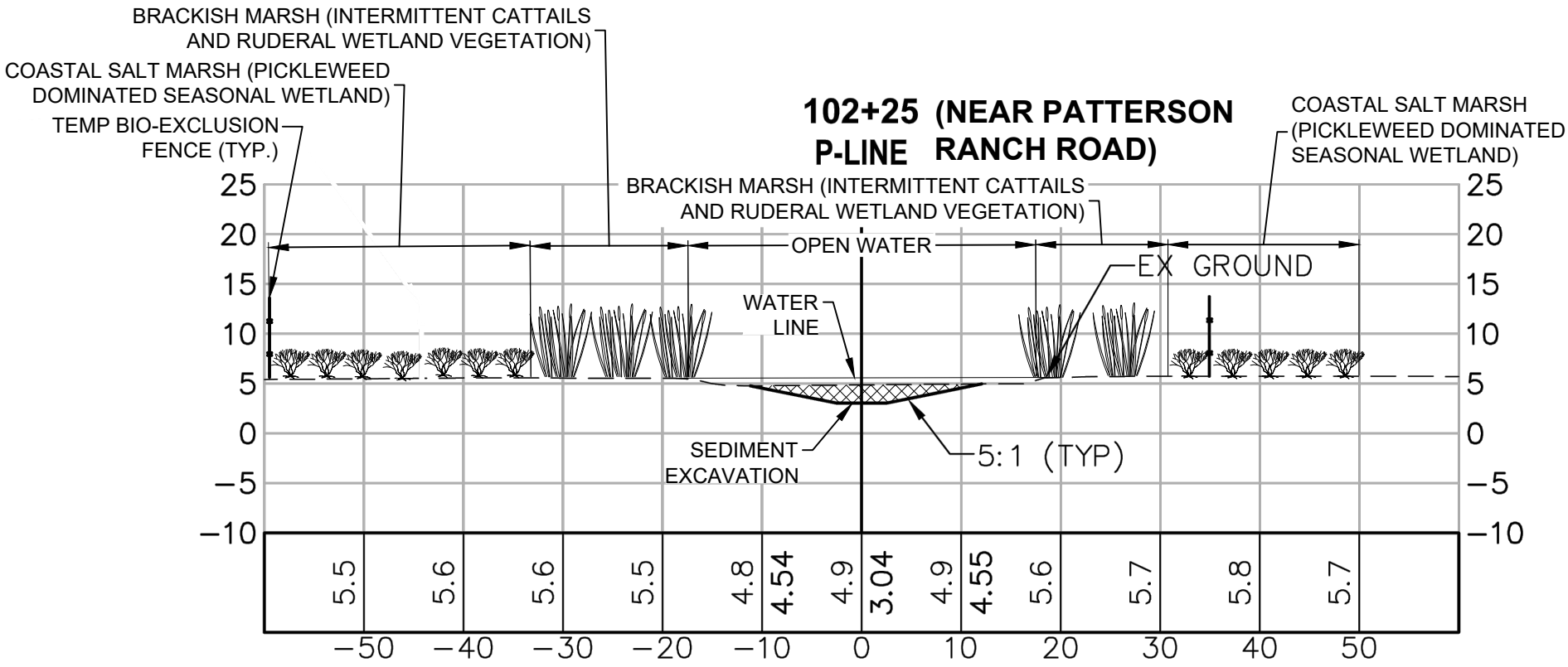
At Patterson Ranch Road and north to Alameda Creek Flood Control Channel, existing deteriorating culverts would be replaced with clearspan bridges at three locations. Cross sections depicting the existing and proposed conditions, including proposed bridges are provided in **Figures 5, 6 and 7.**

1. Approximately 60 ft. long, 24- to 40-foot wide clearspan traffic rated bridge replacing the Patterson Ranch Road tri-culverts and those at Tuibun Trail and approximately 60-foot long 10–foot wide Pedestrian bridge replacing existing Tuibun Trail crossing (if constructed as a separate structure than Patterson Ranch Road vehicle bridge).

2. Approximately 110-foot long 10-foot wide Pedestrian bridge at Chochenyo Trail replacing existing culverts.

3. Approximately 60-foot long 10-foot wide Pedestrian bridge at D.U.S.T. Marsh Trail, replacing existing culverts.

Existing road and trails that are removed as part of bridge installation would be reconstructed as needed to conform to the pre-existing condition. All disturbed areas adjacent to project work would be graded with maximum 3:1 side slope and restored with erosion control blanket and a native hydroseed mix. The culvert to bridge replacement would result in the creation of new open water habitat, replacing the culvert metal bottomed structures. Approximately 650 SF of new open water conditions would be created at Patterson Ranch Road, with approximately 2,800 SF of open water habitat at the Chochenyo Trail crossing site and approximately 2,100 sq. ft. of new open water created by the culvert to bridge replacement at the D.U.S.T. crossing. The bridge(s) at Patterson Ranch Road crossing of Ardenwood Creek may include a pedestrian structure, or these may be a



LEGEND

CATTAIL (*Typha angustifolia*) AND RUDERAL SPECIES

PICKLEWEED (*Salicornia pacifica*): OCCURS WITH SALTGRASS (*Distichlis spicata*), ALKALI HEATH (*Frankenia salina*), AND MARSH JAUMEA (*Jaumea carnosa*)

CHANNEL EXCAVATION AREA

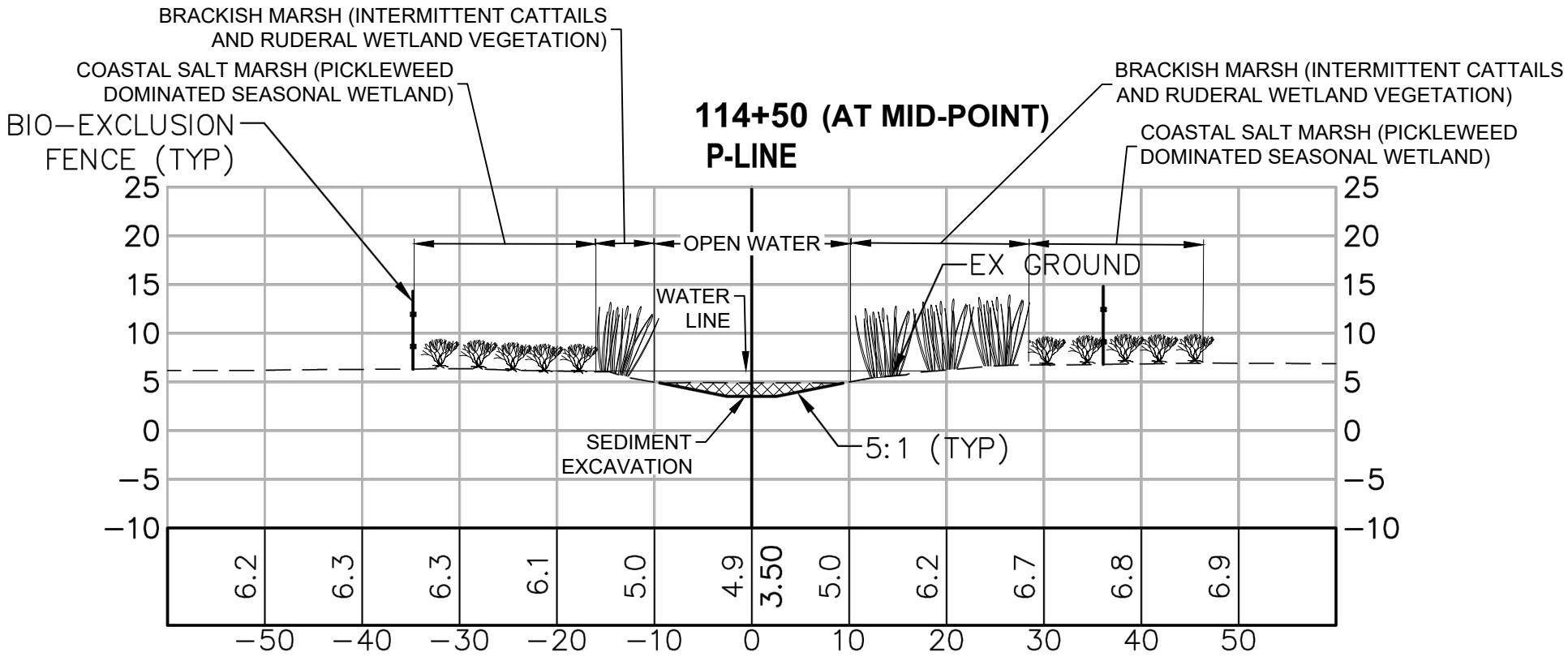
Alameda County Flood Control & Water Conservation District

Questa Engineering Corp.

FIGURE 3

CROSS SECTION 102+25

ARDENWOOD CREEK



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CHANNEL EXCAVATION AREA

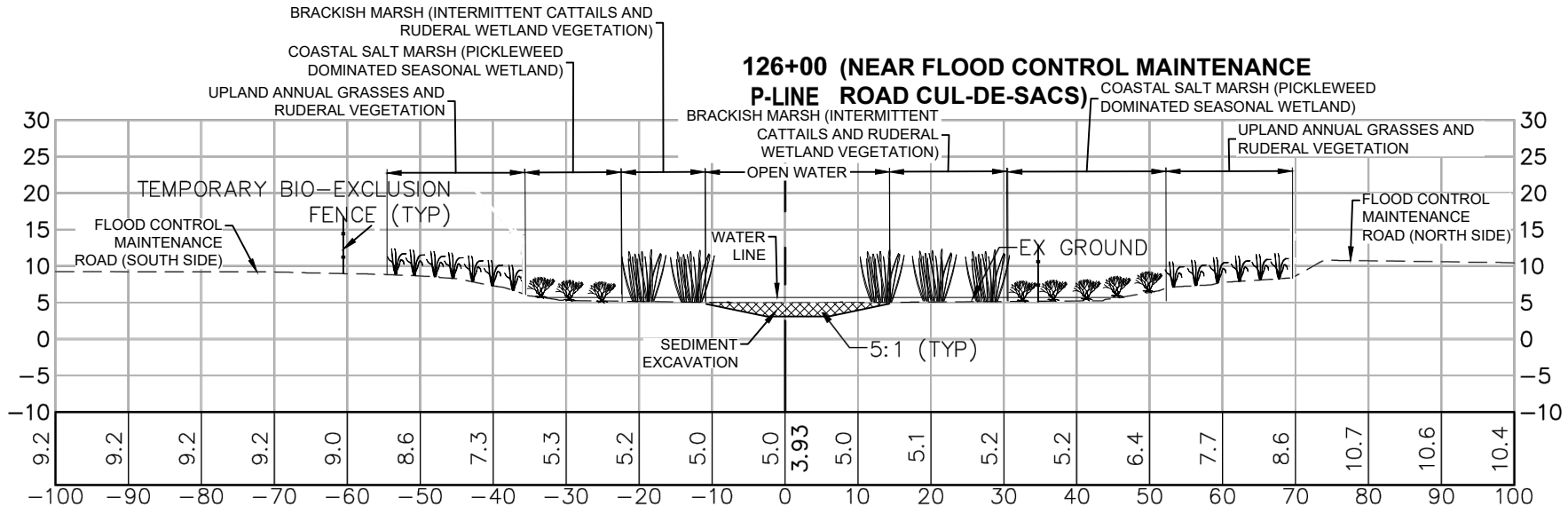
Alameda County Flood Control & Water Conservation District

Questa Engineering Corp.

FIGURE 4A

CROSS SECTION 114+50 - MIDPOINT

ARDENWOOD CREEK



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UPLAND ANNUAL GRASSLANDS AND RUDERAL VEGETATION

CHANNEL EXCAVATION AREA

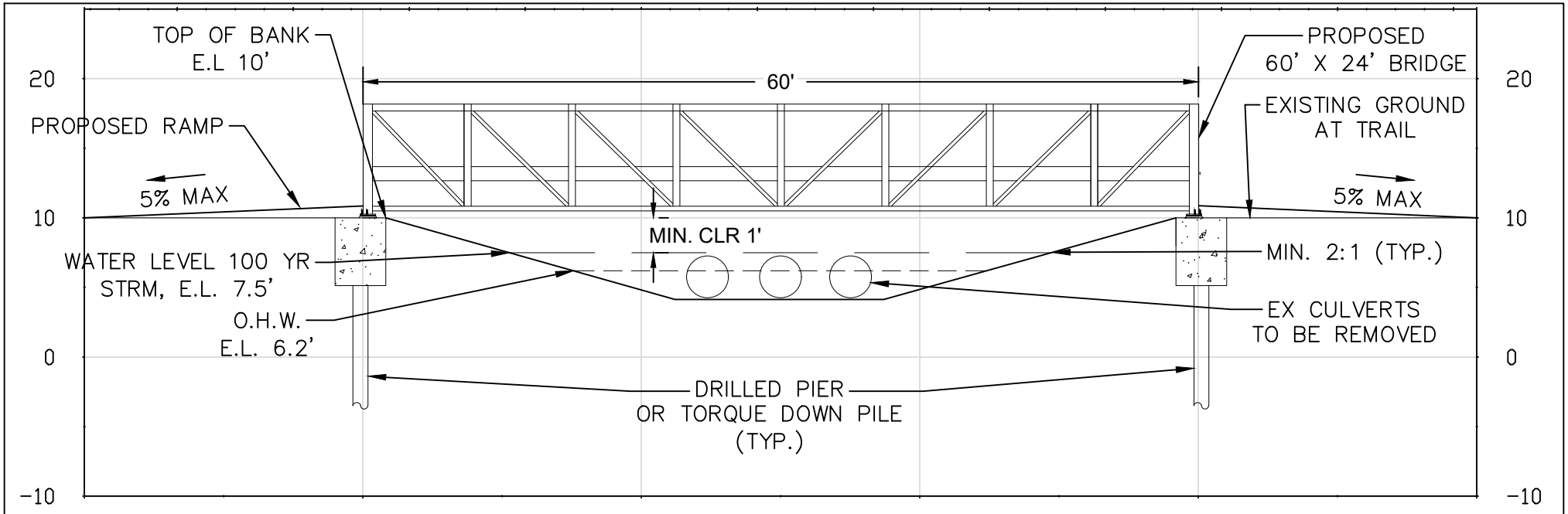
Alameda County Flood Control & Water Conservation District

QUESTA ENGINEERING CORP.

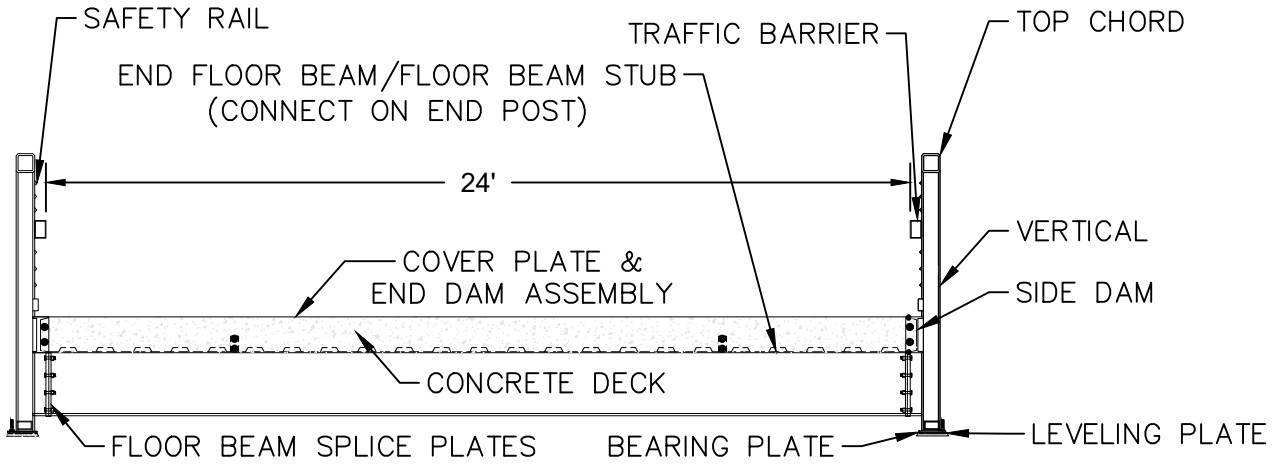
FIGURE 4B

CROSS SECTION 126+00 AT MAINTENANCE ROAD

ARDENWOOD CREEK



BRIDGE PROFILE

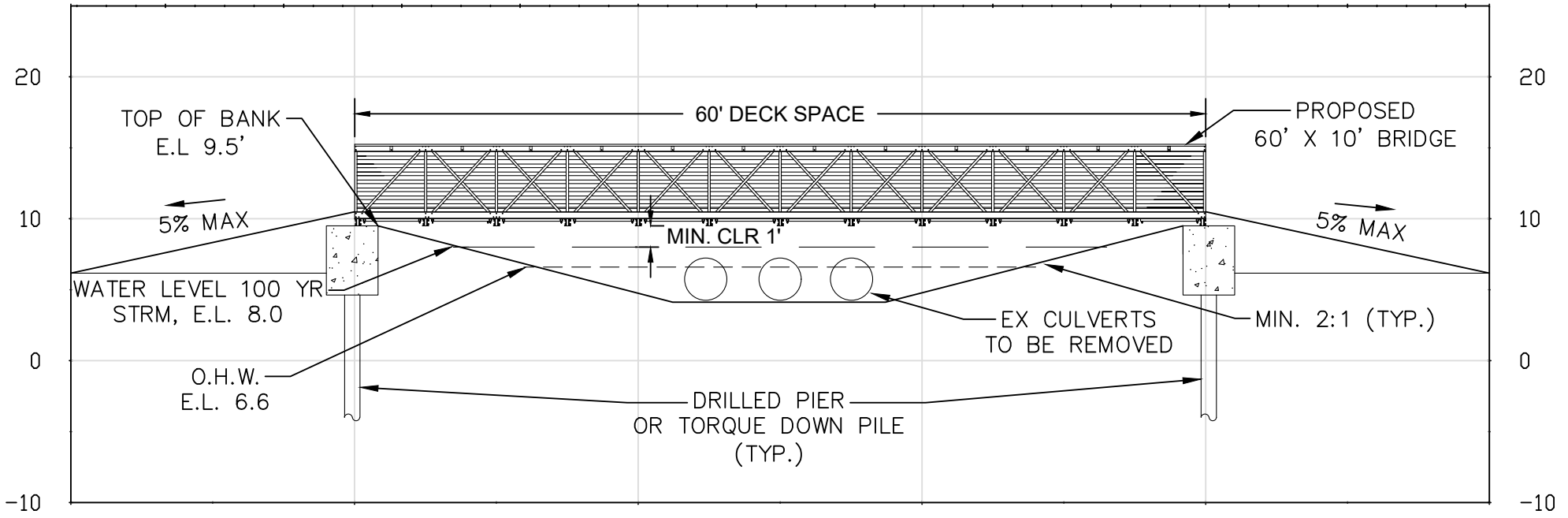


BRIDGE CROSS SECTION

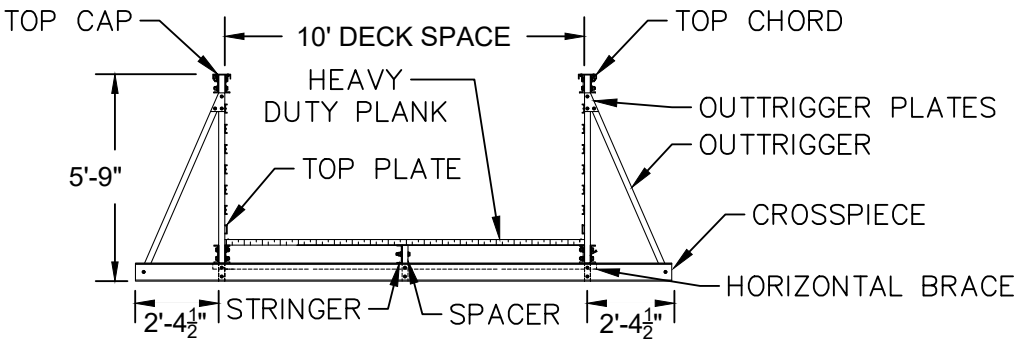
FIGURE 5

PROFILE & SECTION AT PATTERSON RANCH ROAD

ARDENWOOD CREEK



BRIDGE PROFILE

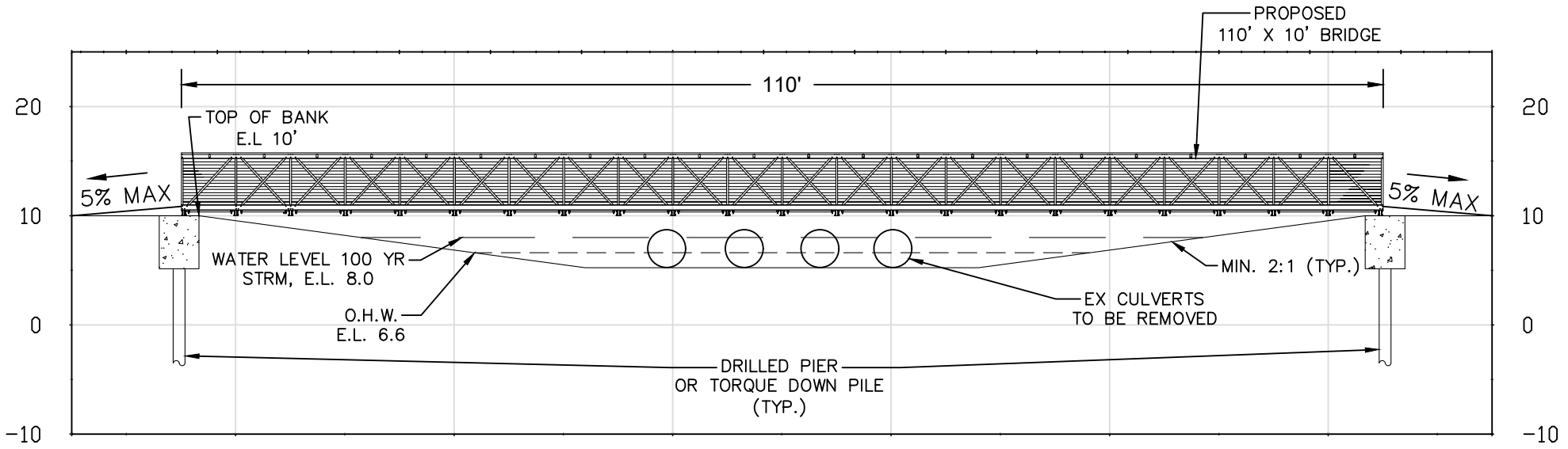


BRIDGE CROSS SECTION

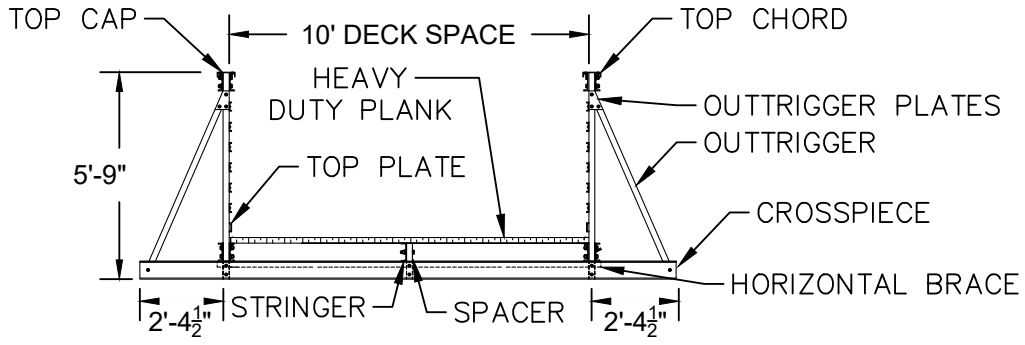
FIGURE 6

PROFILE & SECTION AT CHOCHENYO PEDESTRIAN BRIDGE

ARDENWOOD CREEK



BRIDGE PROFILE



BRIDGE CROSS SECTION

FIGURE 7

PROFILE & SECTION AT DUST PEDESTRIAN BRIDGE

ARDENWOOD CREEK

separate pedestrian bridge crossing for the adjacent Tuibun Trial. This would be resolved during final Phase 3 bridge engineering design.

Construction Methodology - Phases 2 and 3

Phase 2 work (channel excavation) would be accomplished with excavators working within or immediately adjacent to the existing channel bottom to minimize disturbance to areas outside the cleared and ESA fenced project limits. Channel excavation would occur within a twenty- to twenty-five-foot-wide corridor in the approximate center of the ESA fence defined work zone. A loading and truck haul zone would occur outward of this and parallel to it on both sides of the channel an additional 25 to 30 feet in width.

Open channel water control (dewatering) would be used to improve construction equipment access to the channel and excavation work efficiency, and to isolate the work area from "live" or through flowing water. However, as noted previously, because of high groundwater conditions, and expected high rates of inflow and seepage, dewatering is expected to be only partially successful, and construction work would need to occur in standing water that is isolated from live water at the upstream and downstream ends of work by placement of coffer dams. Because of this, the term "partial dewatering" is used. All fish and other aquatic organisms would be removed between the two coffer dams after their installation by a team of Qualified Biologists, using drag netting. The proposed dewatering plan and a fish and aquatic species re-location plan would be prepared and submitted for regulatory agency review prior to implementation. Native fish and other native aquatic species would be relocated downstream of the work area. Nonnative and invasive aquatic species would be destroyed.

In addition to the Channel Dewater Plan and Fish Relocation Plan, an Erosion Control and Revegetation Plan, a Stormwater Pollution Prevention Plan (SWPPP) and a Spill Control and Counter Measures Plan (Spill Control Plan) would be developed by the selected Contractor that would describe the equipment and procedures that the Contractor would use to control upstream inflowing and downstream backflowing water during construction, including water quality protection measures. The Plans would also describe site stabilization, restoration, erosion control and revegetation. These Plans would be subject to the review and approval of the District. These Plans may also be subject to regulatory permitting conditions from the U.S. Army Corps of Engineers, SF Bay Regional Water Quality Control Board, and California Department of Fish and Wildlife.

As noted above, because of a high groundwater table in the Project Area, it is expected that the Contractor would need to be able to work in a wet channel environment. Construction equipment capable of working within a ponded water construction site would be used. This construction disturbed water would be isolated and settled and cleaned or filtered before any as-needed release downstream or discharged into the adjacent wetland drainage area shown on the Plans. If water quality standards as contained in permit conditions are not able to be met, the construction water in

the channel would either need to be further settled on site in holding tanks or bermed non-wetland areas and spread on adjacent upland areas or be off hauled to an approved site for disposal.

Phase 2 channel excavation would be accomplished using track excavators, hauling truck or dump trucks, and/or aquamogs. An aquamog is a special wide track mounted machine with very low ground pressure for use in soft saturated soil. Some models have buckets and cutting blades used for removing aquatic vegetation (and associated sediment) growing over or in water.

Phase 3 construction consists of removal of the existing corrugated metal pipes and reinforced concrete headwalls and foundations, excavation of the channel to create the designed trapezoidal channel under the new bridges, construction of reinforced concrete bridge abutments, foundations, and wing walls, placement of rock riprap adjacent to the bridge abutments and wing walls to protect from scour, and reconstruction of the roadway and trail pavement approach with asphalt concrete and an aggregate base. The conceptual bridge plans propose that all new concrete poured for the bridge abutments and any piers or drilled piles would be placed outside and above of the new top of banks and above the ordinary high water mark (OHWM). This would be confirmed during phase 3 design engineering and permitting work. Water quality in the channel open water areas would be protected using fiber rolls and silt fencing during construction activities. Adjacent sensitive habitat areas would be protected using ESA fencing placed under the direction of a Qualified Biologist. All bridge construction equipment would operate from high ground above jurisdictional wetlands/ and waters and there would be no need to use equipment in the channels for the culvert removal or bridge placement work.

As currently proposed, the culvert removal work would occur within areas of very slow moving open brackish water. Turbidity curtains would be placed immediately upstream and downstream of the culvert removal work areas to protect water quality. A Qualified Biologist would also direct this work.

Dewatering Plan Overview - Phase 2

The Phase 2 dewatering plan has two components: 1) divert nuisance flow (e.g., from upstream urban runoff) and downstream backflow; and 2) partially dewater the channel work area. Temporary cofferdams would be installed upstream and downstream of the project work limits for both the Phase 2 channel excavation work and upstream and downstream of each Phase 3 culvert to be replaced with a clearspan bridge. Water upstream of the upstream temporary cofferdams would be diverted via pipe around the channel work area to downstream of the downstream coffer dam. This water would not need to be filtered or treated. An additional temporary cofferdam would be installed downstream to prevent ponding water from back flowing into the work area. If necessary, the contractor may use a pump to divert water. Partial channel dewatering would consist of collecting and discharging accumulated storm water, ground water, or surface water from the channel during excavation.

Partial Dewatering Components - Phase 2

Types of equipment that could be used to complete the partial dewatering work could include surface pumps, sump pumps, generator well points, baker tanks, coffer dams, bypasses and pipeline

piping for water diversion from upstream, if necessary. A temporary water inflatable structure such as an Aquabarrier may be placed and used to block backflow into the culverts upstream of Patterson Ranch Road. A plywood, visqueen, and sand bag coffer dam system placed on the upstream end of the culverts at Patterson Ranch Road could also be proposed in the Contractor's dewatering plan. All water collected from dewatering, except the upstream channel bypass water, would be filtered, treated and cleaned prior to release to any drainage system.

The dewatering may include the installation of sandbag and visqueen sheeting placed at both the upstream ends of work, to control upstream summer flow in Ardenwood Creek, and at the downstream end of work, to control backflow into the channel from the J Ponds. Two discharge options are presented. In Option 1, the upstream impounded water would be collected and pumped in a bypass pipeline located along the east side of the channel and discharged downstream of Patterson Ranch Road. The bypass flow normally would not require testing, settlement, or filtration prior to downstream channel discharge of the return flow. A second Option would allow the Contractor to discharge the bypass flow via a small pickleweed-dominated existing shallow drainage ditch that drains westward to enter an existing drainage system running along the foot of the Coyote Hills before entering the J Ponds drainage system downstream of Patterson Ranch Road. This drainage system merges with other surface flow from the Crandall Creek and DUST marsh area to eventually discharge to lower Alameda Creek via the flood control tide gates in the northern lower Alameda Creek levee.

In addition to the bypass diverted upstream flow and blocked off downstream flow, groundwater seeping into the channel may potentially require partial removal to allow more efficient equipment access and improved working conditions. This partial dewatering (if proposed by the Contractor) could be accomplished for example by the Contractor using sump pumps and well points placed at low points along the channel. Some of the seepage water would be collected and discharged in a second pipeline, as provided in the Contractor's approved partial dewater plan and SWPPP. This flow would be diverted to a Baker tank placed on high ground near Patterson Ranch Road, where a settlement and filtration system would be used to treat the flow, prior to downstream discharge to Line P below Patterson Ranch Road. As noted previously, this would be determined in the District approved Dewater Plan, to be prepared by the Construction Contractor in compliance with regulatory permit conditions.

If the excavated sediment is extremely wet and saturated, it may need to be placed in a bermed spoil pile area to drain and dry. The spoil pile area would be located on the south side of Line P, near Paseo Padre Parkway. The spoils would typically be placed on plastic or visqueen sheeting ringed by an earthen berm. Following soil draining and drying, the material would be off hauled to an approved landfill or disposal facility. The channel excavation spoil drainage water may also need to be collected and pumped to a Baker tank for settlement and filtration prior to discharge, land spreading, or off haul. The facilities for soil drying and settlement, including possible Baker tank placement areas, are shown on the site plan. These would be located in upland areas.

Overbank Site Preparation and Spoil Off-Haul - Phase 2

Although channel excavation work would occur largely within the partially dewatered isolated open water channel, loading and dump truck or watermog truck haulage of channel excavation sediment could occur within the 75 to 80 foot wide Limits of Work defined by the ESA fencing. Much of this area is currently covered by ruderal vegetation tolerant of wet soil conditions, with areas of cattail marsh, especially near Patterson ranch Road, and outward of those areas of seasonal wetlands consisting of annual grasslands mixed with pickleweed. The pickleweed cover ranges from 30 to 60%. These areas provide habitat for endangered species such as Salt marsh harvest mouse

Regulatory permit conditions would likely require removal of all vegetation where wheeled vehicles may pass over to bare ground. This would be accomplished using mechanized walk behind high weed mowers, for the first pass, with mower blades set 4 to 6 inches above ground surface. This would be followed by a second pass using hand tools or approved small equipment to remove the cut grass and cut the remaining vegetative cover and stubble down to bare soil. This work would be completed under the direct field supervision of a Biological Monitor. This site preparation and pre-excavation work would result in approximately 5.7 acres of habitat disturbance.

The excavated sediment would belong to the Contractor with the requirement to haul to an approved landfill disposal site. As noted above, It may require partial drying within an enclosed bermed drying area, so there is not free water in over-saturated excavated soil. Off haul may use either Patterson Ranch Road, for the northern part of the work, or Paseo Padre Parkway to Highway 84 or other approved surface streets. About 90 to 100 truck trips of 20-yard dump trucks are anticipated to be needed. If required, a traffic control plan to be approved by City of Fremont would be prepared for both Phase 2 and Phase 3 work.

Construction Staging and Mobilization

In Phase 2, an approximately 0.5-acre and 1.5 acre Contractor mobilization or staging and lay down area s would be established on the south side of Line P, Ardenwood Creek. These sites would be used for storage, service and maintenance of equipment, and for holding supplies and materials to be used during the performance of the work. A secondary mobilization area (1.5 acre) on the north side of Line P could also be used but is not shown (**Figure 2A).** This area is also accessed from Paseo Padre Parkway. This upland area is currently disturbed and was used in the recently completed Phase 1 channel and culvert improvement work online P, between Paseo Padre Parkway and the start of the proposed Project. The mobilization areas would be fenced using 6-foot temporary chain link fencing. It may also include a small construction office trailer and portable restrooms. A rocked SWPPP construction entrance to and from Paseo Padre Parkway would also be placed in this area. A second construction entrance would also be installed on Patterson Ranch Road near Line P. Construction staging would also occur along the existing trails at both ends of each of the proposed bridges. Temporary closure or re-routing of trails users to adjacent trails may occur during project construction.

An approximately 2.0 -acre bermed area would also be constructed in this area south of Ardenwood Creek, to be used for as needed sediment drying prior to off-haul.

The work area along the channel work end points is located 1.5 to 2.5 feet lower than the access roadways at both the Patterson Ranch Road and near Paseo Padre Parkway access points and would require some grading and fill placement in non-wetlands to allow equipment access and/or Baker tank placement.

Scedule Phase 2 and Phase 3

Phase 2 and Phase 3 project construction would occur over two or more construction seasons (approximately 4 months during each season, April 15 through October 30). Phase 2, which is scheduled to occur summer of 2023; would take 3 to 3 1/2 months to complete. Work in environmentally sensitive areas or in the creek would not start earlier than September 1st.The Phase 2 work, including mobilization, partial channel de-watering, channel excavation, and de-mobilization is anticipated to last 4-6 weeks. Vegetation clearing , site protection, cofferdam installation and fish relocation is expected to require 2-4 weeks to accomplish. Post- construction erosion control and revegetation is anticipated to require an additional 2 -3 weeks following completion of channel excavation.

Phase 3 would likely begin in 2024. Phase 3- bridge and trail work would follow nesting bird and wet weather/creek flow restrictions on both ends of that general timeline. The anticipated construction window for Phase 2 is also September 1 through October 31, but could be extended until mid or late November, depending on rainfall occurrence during the construction period.

Environmental Protection and Restoration

Construction site protection and restoration includes stormwater management, erosion control, and revegetation of disturbed areas using native plant materials. Site protection measures also include guidance and requirements for vegetation clearing of work areas, as well as protection of special status wildlife species through installation of species-specific ESA fencing. Details on these are included on the Project Plans as well as in Project Controls and Mitigation Measures, such as those contained in the Biological Resources and Hydrology and Water Quality sections.

Project erosion control measures would include planting, hydroseeding, and erosion control blanket (ECB) and fiber roll installation. The hydroseed mix would consist of native species endemic to the project vicinity.

The Construction Contractor would be required to prepare and implement a Spill Control and Counter Measures Plan for addressing any accidental leaks or releases of fuel or other construction chemicals, and a Stormwater Pollution Prevention Plan (SWPPP) for control of erosion and stormwater management during construction, and post construction, until the site is stabilized. The project is expected to be categorized as Risk Level 2 for SWPPP preparation; this would be confirmed by the QSD preparing the SWPPP and following SWPPP preparation guidance documents. In addition to meeting Risk Level 1 requirements, Risk Level 2 requires developers to implement a Rain Event Action Plan (REAP) 48 hours prior to any rain event forecast to have a 50% or greater

chance of producing precipitation in the project area. In addition, best management practices (BMPs) would be implemented to minimize surface runoff originating from the area of disturbance to protect the water quality of adjacent wetlands.

If required by permitting agencies, a Habitat Mitigation and Monitoring Plan (HMMP) would be prepared and implemented to restore and return disturbed areas to a similar or improved pre-construction vegetative cover.

All disturbance related impacts to project wetlands and waters would be temporary and expected to rapidly recover following stabilization and native plant reseeding. The exception to this is the placement of protective rock riprap on the channel banks in the vicinity of the bridge structures. Less than 2,000 SF (0.05 acre) cumulative total rock would be placed at the three bridge sites. This permanent impact is offset by the creation of 5,540 SF (0.13 acre) of new open water habitat where the roadway and trail culverts are removed.

Separate HMMPs may be needed for Phases 2 and 3, as they would be permitted separately. Most disturbed areas currently occupied by cattails are expected to eventually return to cattail cover following completion of the work. Ruderal areas and areas of disturbed pickleweed cover would be seeded or plug planted to a mix of species that are currently found in these areas, including pickleweed, frankenia, gum plant, saltgrass, saltbush, meadow barley and creeping wild ryegrass. All Project disturbance is considered to be temporary, and no on-site or off-site compensatory wetlands mitigation is proposed.

Surrounding Land Uses and Setting:

The project area is within Coyote Hills Regional Park, primarily on lands owned by the Flood Control District and leased to EBRPD. Patterson Ranch Road right of way is owned by EBRPD. East of Paseo Padre Parkway are office and technology campuses and residential uses. The Park surrounds the project area on all sides.

Other Public Agencies that Require Approval

It is anticipated that permits and/or project approvals (e.g., permits, financial approval, or participation agreements) would be required from the following separate agencies.

Federal Agencies

U.S. Army Corps of Engineers – Permits for any earthwork in jurisdictional wetland areas or over Waters of the U.S. Under Section 404 of the Clean Water Act permits would be required for excavation of the channel and placement of fill for bridges and trail structures. These may be covered under Corps Nationwide Permit 14 – *Linear Transportation Projects*. Revegetation/enhancement of existing seasonal wetlands and riparian areas may be covered under a Corps Nationwide Permit 27 – *Aquatic Habitat Restoration, Establishment, and Enhancement Activities*

U.S. Fish & Wildlife Service and National Marine Fisheries Service – The Corps of Engineers may initiate consultation with the U.S. Fish and Wildlife Service and National Marine Fisheries Service in accordance with Section 7 of the Endangered Species Act because of activities in wetlands/ waters that are occupied by listed or protected species. The agencies may consult on the potential impacts of the proposed project to Special Status fish and wildlife species and their habitat and require project specific measures to avoid and minimize impacts, and to provide appropriate compensatory mitigation.

State Agencies

CA Department of Fish and Wildlife – A Section 1600 Stream or Lakebed Alteration Agreement may be required from the California Department of Fish & Wildlife for activities within the channel corridor, as well as for bridge crossings. Coordination and consultation with them may also be required for issues associated with potential project impacts on or within habitat areas occupied by protected or listed species covered under the California Endangered Species Act, such as for northern harrier and Black rail, and for any protected plant species. This would also include development and approval of mitigation or restoration and resource protection plans.

San Francisco Bay Regional Water Quality Control Board (RWQCB) –The project may require Water Quality Certification under Section 401 of the Clean Water Act, Notice of Intent (NOI) for construction activity, and Waste Discharge Requirements (WDRs) pursuant to California's Porter-Cologne Act for any wetlands or state and federal waters that are impacted.

Regional Agencies

Bay Area Air Quality Management District - Construction work involving use of heavy equipment and associated air emissions would require a permit from this agency.

East Bay Regional Park District (EBRPD) - Operator of Coyote Hills Regional Park; coordination of park use, closure and operation. The Park District also owns Patterson Ranch Road and the adjacent Tuibun and D.U.S.T. Trails an agreement from them would be needed for replacement of the culverts with a vehicular bridge and/or separate trail bridges at the Line P crossing of this roadway and other trails. The agreement would likely require preparation and implementation of bicycle and pedestrian detour plans.

SF Bay Conservation and Development Commission (BCDC)- BCDC has determined that they do not have permitting authority over this project.

County and Local Agencies

City of Fremont. Grading, stormwater management and drainage, and bridges over FEMA regulatory flood plains may require review by the City Engineering Department and approval by the City's Floodplain Manager in the Engineering Department. A Traffic Control Plan may be needed for the truck route and staging.

Alameda County Water District (ACWD). ACWD has installed and operates several groundwater monitoring wells in the vicinity of the Patterson Ranch Road crossing of Line P. These wells would

either need to be protected or, if in conflict with bridge improvements, relocated. An agreement with them for this work would be needed. In addition, any additional de-watering structure, such as a well point drainage system, if proposed by the Contractor, would need a ACWD permit. Project work elements that require coordination, permit applications, and approval from ACWD include:

- Monitoring wells areas along Patterson Ranch Road at or near the Line P crossing note above that may be affected by project construction activities. Some of these may require relocation.
- Deep piers for bridge structures that may penetrate near-surface aquifers.
- Water lines in Patterson Ranch Road corridor potentially affected by bridge construction.

Union Sanitary District. A 4 inch sanitary sewer force main from the Visitor Center pump station to the Paseo Padre Parkway point of sewer connection occurs along the Patterson Ranch Road corridor. The culvert to bridge replacement element of the project would need to accommodate this.

Any proposed construction within or near a USD easement or heavy construction traffic over USD force mains also requires specific approval from USD. For construction traffic/haul roads, USD would require an Encroachment Permit that may include a specific agreement and temporary improvements such as using steel trench plates.

Existing Site Conditions

The following provides an overview and summary of the environmental setting of the Project area. The Project site generally consists of open water, grassland and seasonal wetlands adjacent to the Coyote Hills. Ardenwood Creek (P-Line flood control channel) drains into Pelican Marsh within Coyote Hills Regional Park to the west. Scattered trees are located along the channels; none are located within the project work area.

Visual Resources. The Coyote Hills rises above the Bay Plain and form the most striking and visually important view within the project area. Other visual elements existing at or near the site include utility poles, fencing, and ponds with cattail-lined edges. North of Patterson Ranch Road, the trail and boardwalk system provides near-term views of wetlands and water.

Agriculture. There are no agricultural lands in the Project Area.

Biology. Existing biological resources are discussed in detail in the Project *Biological Resources Assessment* and Checklist setting description.

Cultural Resources. An Archaeological Resources Review of the site was completed in March 2020. No prehistoric sites, combined prehistoric, and/or historic era sites were found in or adjacent to the project area. The area is considered highly sensitive for cultural resources, and known catalogued, and significant Native American (Ohlone people) cultural resources occur adjacent to the project area. There is a potential for other presently unknown cultural resources, buried at shallow depths, to occur within the project area.

AB52 consultation was conducted in January 2021, with a field meeting with Tribal members in March 2021. No additional comments were made. Worker Awareness Training for archaeological resources to the contractor would be provided by the District due to the "sensitivity" of the area for both Phase 2 and Phase 3 projects.

Geology and Soils. The project area is underlain by alluvial deposits, including fine grained flood basin and estuarine deposits north and south of Patterson Ranch Road and recent stream alluvium (fine grained flood basin deposits) to the east and north-east. There are no known or recognized active earthquake faults that pass through the project area. The Hayward Fault is located 4 miles to the east and the San Andreas Fault is located 13 miles to the west.

Based on geotechnical investigations completed for near-by areas, project area soils are likely to be susceptible to liquefaction associated with strong ground motion from activity on regional faults. The design of the bridges would require seismic consideration in design. Other geotechnical issues requiring consideration in planning and design include poor drainage and high-groundwater conditions, clayey and expansive soils, and corrosive soil conditions that could affect concrete and metal associated with bridge abutments and underground utilities. Existing soils and geologic conditions are discussed in more detail in the Project Checklist *Geology and Soils* section.

Surface and Groundwater Hydrology. Hydrologic conditions in the project area have been significantly altered by agricultural drainage and historical irrigation well pumping, urbanization, and

flood control channel construction. Existing hydrologic resources are discussed in more detail in the Project Checklist *Hydrology and Water Quality* description.

Climate Change and Sea Level Rise. The Project area is not physically connected to San Francisco Bay and therefore would not be directly physically impacted by rising Bay tides, including extreme tides, with sea level rise. In general terms, climate change would likely result in a warmer and drier climate in northern California. Recent trends indicate that northern California is already experiencing some of the hottest years in recorded history. It is also experiencing shorter winters, with significant rainfall appearing to come later in the season and ending sooner than typical historic patterns. Rainfall intensity and runoff patterns also appear to be changing, with more short-duration high-intensity storms and associated flashy runoff events.

Sea level rise in this managed flood control basin would primarily affect the efficiency of discharging flood waters through Alameda Creek levee tide gates from Ardenwood Creek and Crandall Creek inflows, because of the resultant higher tidal levels in Alameda Creek and higher flood water surface elevations. Climate change may result in more frequent and prolonged periods of ponding in seasonal wetlands as well as the gradual rise of the shallow groundwater table associated with tidal affects on groundwater from the bay margin. The shallow groundwater zone may also become more saline and alkaline over time, associated with the influence of rising Bay tides. This project is intended to improve Line P through the existing Coyote Hills regional Park, would help alleviate the depth and extent of winter ponding and flooding.

Existing infrastructure potentially at risk in the not-too-distant future would be low areas of Patterson Ranch Road near the Ardenwood Creek Crossing leading to Park headquarters and the Visitors Center. It is expected that because of a rise in bay tidal elevations, perennial and seasonal wetlands occurring within and near the Park and along portions of {Patterson ranch Road in the vicinity of the Line P crossing would be ponded deeper, and for longer periods with climate change, with some areas with more extended ponding and becoming near perennial. Longer periods with deeper water may be expected to occur in current ponded areas dominated by cattails. The proposed Project would help alleviate these conditions.

Other potential threats to the Project area from climate change are principally related to an expected increase in extreme weather events, including more often and prolonged periods of drought, and more often very wet winters, when extended shallow water ponding occurs. Shallow groundwater levels may fluctuate up and down during these periods of drought and abundant rainfall, but the long-term trend is anticipated to be a gradual rise in the shallow zone groundwater table and increased shallow zone groundwater salinity and alkalinity.

Access and Circulation. The project area is accessed from Patterson Ranch Road and Paseo Padre Parkway and service roads on the north and south sides of Ardenwood Creek that extend approximately one-half mile west from Paseo Padre Parkway. Patterson ranch road is accessed from Paseo Padre Parkway and extends about 1 ½ miles west to the Coyote Hills Regional Park Visitor Center.

Utilities and Infrastructure. Utility infrastructure is generally located in the vicinity of Patterson Ranch Road, including a 4-inch pressurized sewer line running along the north side of Patterson Ranch Road, along with a 4-inch (not live) PVC water line that is not connected to a meter. There are ACWD monitoring wells in the vicinity of the D.U.S.T. Trail and Patterson Ranch Road proposed bridges. Well pumps and monitoring wells also are located near the end of the service roads along Ardenwood Creek approximately one-half mile west of Paseo Padre Parkway.

Public Services. Police, fire, and emergency response to incidents occurring within the project area are currently managed cooperatively in agreements with the City of Fremont Police and Fire Departments and the Alameda County Fire Department. Follow-up investigations and incident reports are typically handled by the EBRPD Police Force. Park District staff assigned to Coyote Hills Regional Park and ACFCWCD occasionally also patrol this area.

Tribal Outreach. The District provided formal notification in January 2021 to those California Native American tribes that are traditionally and culturally affiliated with the geographic area within which the proposed project is located pursuant to the consultation requirements of AB 52. One response was received. On January 28, 2021, the Northern Valley Yokut Tribe and Nototomne Cultural Preservation requested consultation on the proposed project. The District met with Tribal members on March 12, 2021, in the field to review the site, discuss the tribal representative's comments and listen to their concerns. . The Tribal representative requested notification and presence to examine channel sediment and during excavation of footings.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist in Chapter 3.0.

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

Determination

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION would be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there would 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 would be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "Potentially Significant Impact" or "Potentially Significant Unless Mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature Date

2.0 CEQA ENVIRONMENTAL CHECKLIST

1. Aesthetics

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

Introduction

The Coyote Hills rise above the Bay Plain, as seen from Paseo Padre Parkway and form the most striking and visually important view within the project area. Near views are of open fields, wetlands and open water.

The project involves excavation of an existing channel within the viewshed of Coyote Hills. Work would occur generally below eye level of adjacent viewing areas. Temporary changes to the visual character of the site may occur due to views of construction equipment during implementation and during vegetation reestablishment following channel excavation.

Comments to Questions

a) Have a substantial adverse effect on a scenic vista?

Less than significant impact. The project area is within Coyote Hills Regional Park and contains important aesthetic and visual resources. Views of wetlands, Don Edwards San Francisco Bay National Wildlife Refuge, the surrounding San Francisco Bay and their associated habitats, and nearby open space are important visual resources. Paseo Padre Parkway, adjacent to the project site

on the east, is designated as a scenic route in the Fremont General Plan[1] and Alameda County General Plan.[2] The Alameda Creek flood control channels are considered a scenic resource by the City of Fremont. Temporary impacts may occur as a result of views of construction equipment during project work. This is a less than significant impact.

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

No impact. The closest state scenic highway to the project area is the portion of SR 84 between Mission Boulevard and I-680 (Niles Canyon).[3] Although SR-84 runs approximately one mile south of the project area, the segment officially designated as a state scenic highway is located approximately six miles east of the project area. Due to this distance, this designated portion of SR-84 is not within the project's viewshed. Motorists traveling on the state designated scenic segment of SR-84 would not be able to see the project area, nor would individuals on the project site be able to view the scenic highway portion of SR-84.

Paseo Padre Parkway, bordering the project site to the east, and the segment of State Highway Route 84 located south of Coyote Hills Regional Park and the project area, have been designated "Scenic Routes" by Alameda County[4] and the City of Fremont5 because they provide unique vistas. None of the project components would introduce large or incompatible new visual elements, or substantially degrade its scenic quality. Coyote Hills Regional Park contains unique natural and geologic features, like the Coyote Hills themselves, whose scenic character is particularly important. The proposed project would not adversely affect these existing visual resources.

The project would have no impact on views from a state scenic highway, nor substantially damage scenic resources.

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

Less than significant impact. The proposed project would not adversely affect the visual quality of the project site because it would allow the site to be returned to a more natural appearance, with a

1 City of Fremont, City of Fremont General Plan, Adopted December 2011, Community Character Element, Diagram 4-6.

2 Alameda County, Scenic Route Element of the General Plan, May 1966, Amended May 5, 1994, Scenic Route Element of the General Plan Map.

3 California Department of Transportation, California Scenic Highway Mapping System, available online at: http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/index.htm, accessed 2 May 2108.

4 Alameda County, Scenic Route Element of the General Plan, May 1966, Amended May 5, 1994, Scenic Route Element of the General Plan Map.

5 City of Fremont, City of Fremont General Plan, Adopted December 2011, Community Character Element, Diagram 4- 6.

functioning channel section and native vegetation. The proposed project, which would involve channel excavation, new bridge structures and revegetation, would not permanently affect the visual resources of the Park or the creek channel. Impacts on scenic views caused by construction of infrastructure and channel excavation would be temporary in duration and limited to relatively small portions of the site. Views of surrounding hills and open space areas would not be affected.

Work would occur generally below eye level of adjacent public viewing areas. Temporary changes to the visual character of the site may occur due to views of construction equipment during implementation, and during vegetation reestablishment following channel excavation.

The project would not conflict with the applicable zoning class (Open Space), or Fremont General Plan policies governing scenic quality.

Implementation of the project would not substantially alter the project area's distinctive visual character, substantially degrade public views of the site, or conflict with applicable zoning and other regulations governing scenic quality. Therefore, the project would cause a less-than-significant visual impact.

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

No impact. The proposed project would not include any lighting. The project would not create any new sources of light or glare.

Mitigation Measures

No mitigation measures are proposed.

2. Agriculture and Forestry Resources

	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?	☐	☐	☐	☒

Comments to Questions

The site does not contain, nor is suitable for agriculture or forestry uses.

a, b) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? Conflict with existing zoning for agricultural use, or a Williamson Act contract?

No impact. The site does not contain farmland, nor is it zoned for agricultural use; no ***impact*** would occur.

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

No impact. The project site is not zoned as forest land, timberland, or Timberland Production. The project would not conflict with existing zoning for, or cause rezoning of, forest land, timberland, or Timberland Production. ***No impact*** would occur.

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

No impact. There is no forest land on the project site. There would be ***no impact*** on forest land.

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

No impact. The project site has no forest land and would not involve changes that would result in conversion of forest land to non-forest use. The project site does not contain Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, and would not involve changes that would result in conversion of agricultural land to non-agricultural use. ***No impact*** would occur.

Mitigation Measures

No mitigation measures are proposed.

3. Air Quality

	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?	☐	☐	☒	☐

Introduction

The project site lies in the Southwestern Alameda climatological sub-region of the Bay Area. The air pollution potential of this sub-region is relatively high in the summer and fall when regional winds can transport pollutants from other areas and where the confining terrain of the East Bay hills can concentrate them locally[6]. This sub-region contains numerous and varied stationary industrial/commercial air pollution sources and major regional roadways, including I-880, I-680 and State Route (SR) 84, which are also major pollutant sources. Several stationary industrial/commercial air pollution sources are clustered in the Ardenwood Technology Park east of the Paseo Padre Parkway across from the Project site. SR 84 passes less than a mile south of the Project site and Paseo Padre Parkway, a major local arterial and the Project site's main access route, runs along the eastern Project site boundary.

[6] Bay Area Air Quality Management District (BAAQMD). *California Environmental Quality Act Air Quality Guidelines*. May 2017.

The Bay Area Air Quality Management District (BAAQMD) maintains several air quality monitoring stations and continually measures the ambient concentrations of major air pollutants throughout the Bay Area. The closest such monitoring station is in Hayward, about seven miles northeast of the Project site. Only ozone (which is formed in the atmosphere from chemical precursors - reactive organic gases [ROG] and nitrogen oxides [NOx]) is monitored there. The closest station that monitors inhalable/fine suspended particulate matter (PM_{10} /$PM_{2.5}$) is in San Jose, approximately 17 miles southeast of the Project site. Exceedances of the ozone and particulate ambient air quality standards have been recorded at each station, respectively, in recent years[7], as shown in **Table AQ-1.**

These are the primary air pollutants of concern when evaluating the air quality impacts on and by development projects in the Bay Area. Other toxic air contaminants (TACs) are also of concern regionally. In the Bay Area, the majority of the estimated carcinogenic/chronic health risk from TACs can be attributed to relatively few compounds, the most important being particulate matter from diesel-fueled engines (DPM, almost all of which is also $PM_{2.5}$). The California Air Resources Board (CARB) has identified DPM as being responsible for about 70 percent of the cancer risk in California from airborne TAC exposures[8].

[7] BAAQMD. Air Quality Summary Reports. http://www.baaqmd.gov/about-air-quality/air-quality-summaries

[8] California Air Resources Board (CARB). Summary: Diesel Particulate Matter Health Impacts. https://ww2.arb.ca.gov/index.php/resources/summary-diesel-particulate-matter-health-impacts

Table AQ-1: Local Ambient Air Quality Monitoring Summary

Pollutant	Air Quality Standard	Maximum Concentrations and Number of Days Standards Exceeded		
		2017	2018	2019
Ozone				
Maximum 8-hour concentration (ppm)		110	66	85
# Days 8-hour California standard exceeded	70 ppb	4	0	2
Nitrogen Dioxide (NO_2)				
Maximum 1-hour concentration (ppb)		68	86	60
# Days national 1-hour standard exceeded	100 ppb	0	0	0
Suspended Inhalable Particulates (PM_{10})				
Maximum 24-hour concentration ($\mu g/m^3$)		70	122	77
# Days national 24-hour standard exceeded	150 $\mu g/m^3$	0	4	0
Suspended Fine Particulates ($PM_{2.5}$)				
Maximum 24-hour concentration ($\mu g/m^3$)		49.7	133.9	27.6
# Days national 24-hour standard exceeded	35 $\mu g/m^3$	6	15	0

Notes:
$\mu g/m^3$ = micrograms per cubic meter
ppb = parts per billion.

Source: BAAQMD Annual Bay Area Air Quality Summaries http://www.baaqmd.gov/about-air-quality/air-quality-summaries

The Project site is within Coyote Hills Regional Park. The nearest air-pollutant-sensitive receptors, a single-family residential area, lies more than 1,000 feet east of the Project site at its closest approach and just east of Ardenwood Boulevard.

The air quality analyses addressing the Initial Study air quality checklist items above were performed using the methodologies and significance thresholds recommended in *CEQA Air Quality Guidelines* (BAAQMD, May 2017, Table 2-1). The air pollutant emissions of the ozone precursors ROG and NO_x, and of PM_{10}, and $PM_{2.5}$ are evaluated. Health risks associated with Project construction DPM emissions in the context of cumulative health risks from TAC emissions by existing local sources are also evaluated.

The analysis assumed that the Project applicant (ACFCWCD) would obtain a BAAQMD permit if required for construction and that fugitive dust control BMPs would be routinely implemented by the construction contractor in accordance with construction standards and as contained in the applicable Project Construction Documents.

According to the *Guidelines*, any project would have a significant potential for contributing to a local air quality standard violation or making a cumulatively considerable contribution to a regional air

quality problem if its pollutant emissions would exceed any of the thresholds presented in **Table AQ-2** during project construction or operation.

Table AQ-2: CEQA Air Quality Significance Thresholds for Air Pollutant Emissions

Pollutant	Construction Average Daily (lbs./day)	Operational	
		Average Daily (lbs./day)	Maximum Annual (tons/year)
Reactive Organic Gases (ROG)	54	54	10
Oxides of Nitrogen (NO_x)	54	54	10
Inhalable Particulate Matter (PM_{10})	82 (exhaust)	82	15
Fine Inhalable Particulate Matter ($PM_{2.5}$)	54 (exhaust)	54	10
PM_{10}/$PM_{2.5}$ (Fugitive Dust)	BMPs[a]	N/A	N/A

Notes: BMPs = Best Management Practices
N/A = Not Applicable

[a] *If BAAQMD Best Management Practices (BMPs) for fugitive dust control are implemented during construction, the impacts of such residual emissions are considered to be less than significant.*

Source: BAAQMD, CEQA Air Quality Guidelines (May 2017).

The Guidelines also establish a relevant zone of influence for assessment of project-level and cumulative health risk from TAC exposure to an area within 1,000 feet of a project site. The project is more than 2,000 feet west of any sensitive receptor.

Cumulative impacts from TACs emitted from freeways, state highways or high-volume roadways (i.e., the latter defined as having traffic volumes of 10,000 vehicles or more per day or 1,000 trucks per day) and from all BAAQMD-permitted stationary sources to sensitive receptors within the zone of influence that exceed any of the following thresholds are considered cumulatively significant:

- A combined excess cancer risk level of more than 100 in one million.
- A combined non-cancer hazard index greater than 10.0.
- A combined incremental increase in annual average $PM_{2.5}$ concentrations greater than 0.8 µg/m3.

Comments to Questions

a) Conflict with or obstruct implementation of the applicable air quality plan?

Less than Significant. In the Bay Area, the current applicable regional air quality plan is the BAAQMD's *2017 Clean Air* Plan: Spare the Air, Cool the Climate (2017 Plan), which focuses on two closely related goals: protecting public health and protecting the climate (the latter addressed in Section VII below). The 2017 Plan defines an integrated, multi pollutant control strategy to reduce emissions of particulate matter, TACs, ozone precursors and greenhouse gases (GHG) based on four key priorities:

- Reduce emissions of criteria air pollutants and TACs from all key sources.
- Reduce emissions of "super-GHGs" such as methane, black carbon and fluorinated gases.
- Decrease demand for fossil fuels (i.e., gasoline, diesel and natural gas).
- Decarbonize the energy system.

The purpose of the proposed Project is to restore channel capacity and improve hydrologic flow to reduce flood risk in the existing Coyote Hills Regional Park in southwest Alameda County. It would not have the potential to substantially increase regional population, employment or transportation levels in Alameda County and the Bay Area, all of which are the bases of the 2017 Plan's regional emission inventories and the emission control policies they support. Thus, it would not impede attainment of 2017 Plan goals.

Also, compliance with all CEQA air quality significance thresholds are necessary conditions for determining that a project would not interfere with the attainment of air quality plan goals. The Project would not interfere with the 2017 Plan because it meets all CEQA limits on air pollutant emissions and their consequent health risks to the local population. Therefore, Project impacts to/conflicts with the 2017 Plan would be ***less than significant***.

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?

Less than Significant. Project improvements are planned to occur in two phases over multiple years. During this time, the Project would generate emissions of air pollutants in construction equipment exhaust and fugitive dust from equipment and material movement. The analysis described below assumed a worst-case (maximum daily emission) scenario. BAAQMD CEQA methodologies recommend quantification of construction-related and operational emissions and comparison of those emissions to the CEQA significance thresholds. Thus, the California Emissions Estimator Model (CalEEMod, Version 2016.3.2, including, where appropriate, the independent use of its methodologies, as specified in its *User's Guide* Appendix A, and its default equipment emission rate tables, as specified in its *User's Guide* Appendix D) and the CARB's EMFAC2017 on-road emission database were used for this purpose. [9, 10]

[9] California Air Pollution Control Officers Association (CAPCOA). *California Emissions Estimator Model (CalEEMod) User's Guide*. http://www.caleemod.com/

Table AQ-2 displays the estimated pollutant emissions from Project construction equipment and material haul trucks. The average daily construction emissions from this activity were compared to CEQA significance thresholds, which they do not exceed.

Table AQ-2: Air Pollutant Emissions from Project Improvements and Restoration.

	Project Activity Emissions (average daily lbs.)			
Project Area/ Work Period	**ROG**	**NO_x**	**Exhaust PM_{10}**	**Exhaust $PM_{2.5}$**
Channel Grading /Year 2022	1.61	14.49	0.63	0.58
Bridge 1/Year 2024	0.83	6.91	0.30	0.27
Bridge 2/Year 2024	0.45	3.62	0.13	0.12
Bridge 3/Year 2024	0.45	3.62	0.13	0.12
BAAQMD Daily Threshold	**54**	**54**	**82**	**54**
Exceeds Threshold?	**No**	**No**	**No**	**No**

Source: Based on Project phasing and equipment use data, equipment pollutant emission rates provided by the CalEEMod model (User's Guide, Appendix D), and on-road motor vehicle pollutant emission rates provided by the EMFAC2017 model.

No additional vehicle use, or site visits are anticipated as a result of Project implementation. Thus, the proposed Project's net new operational emissions would not substantially contribute to any existing air quality violation, and this impact would be ***less than significant***.

c) Expose sensitive receptors to substantial pollutant concentrations?

There are no sensitive receptors within 1,000 feet of the project site. There would be ***no impact***.

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

Less than Significant with mitigation incorporated**.** Fugitive dust from earth movement and travel over unpaved ground during Project improvement phases could lead to local violations of ambient particulate standards unless adequate dust suppression measures are implemented. For CEQA projects in the Bay Area, BAAQMD Guidelines require the implementation basic construction BMPs to control fugitive dust. These same BAAQMD Guidelines are included in the City of Fremont's

[10] CARB, EMFAC Web Database. https://www.arb.ca.gov/emfac/

Standard Development Requirements contained in Municipal Code Section 18.218.050. Through implementation of the following BMPs contained in Mitigation Measure AIR-1, potential fugitive dust impacts would reduce to a ***less-than-significant*** level with implementation of the following mitigation measures.

Mitigation Measure

AIR-1 The following Best Management Practices (BMPs) shall be included in the Project construction dust/emission control plan with a designated contact person for on-site implementation:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- Abutments shall be laid as soon as possible after grading unless seeding or soil binders are used.
- A publicly visible sign shall be posted with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The ACFCWCD‘s phone number shall also be visible to ensure compliance with applicable regulations.

4. Biological Resources

	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 Game 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 Game 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?	☐	☐	☐	☒

Introduction

This section provides a summary of the existing biological resources on the site and an assessment of the potential impacts of implementing the Project. The assessment of potential impacts on biological resources involved a review of available background information for the site vicinity, performing a habitat assessment of the project site to determine suitability of special-status animals and confirming the extent of regulated waters, and systematic field surveys to confirm presence or absence of special-status plants. Available background information included: the occurrence data of special-status species and sensitive natural communities maintained by the California Natural Diversity Data Base (CNDDB) of the California Department of Fish and Wildlife (CDFW); wetlands

mapped as part of the National Wetlands Inventory maintained by the U.S. Fish and Wildlife Service (USFWS); mapping of critical habitat for federally-listed species maintained by the USFWS; and detailed surveys and mapping of the site. These detailed surveys included: a *Biological Resource Assessment Report* (BRA),[11] floristic surveys for special-status plant species,[12] and a *Preliminary Delineation of Wetlands and Other Waters* (PWD).[13] A detailed Aquatic Resource Assessment (see Appendix A) was conducted as part of the IS/MND review to fully understand fishery resources associated with Ardenwood Creek and the potential effects of the project on aquatic habitat at the site and on downstream waters. Field reconnaissance surveys were conducted by the IS/MND consulting biologist on March 22 and June 27, 2022, to evaluate field conditions, conclusions reached in past site surveys, and assess potential impacts of the proposed project.

Environmental Setting

The following provides a summary of the vegetation and wildlife habitat, potential for special-status species, and extent of regulated waters on the project site. This is followed by a listing of Project Controls to be implemented as part of the proposed project to avoid and minimize potential adverse impacts on sensitive resources, and assessment of the significant of potential impacts, and need for any additional measures to serve as mitigation for any significant impacts not fully addressed by Project Controls.

Vegetation and Wildlife

Vegetation in the site vicinity is composed of an historic complex of perennial marsh, seasonal wetlands and ruderal (weedy) grasslands .Vegetative cover reflects the salinity levels along Ardenwood Creek, with freshwater marsh dominated by stands of narrowleaf cattail (*Typha angustifolia*) in the upstream end of the site and becoming increasingly brackish downstream of Patterson Ranch Road. At the northern end of the project reach, north of the DUST Trail, Ardenwood Creek flows through a large expanse of coastal salt marsh vegetation dominated by pickleweed (*Sarcocornia pacifica*) referred to as North Marsh. It then passes through a flood control gate a levee into the tidally-influenced reach of lower Alameda Creek.

Cattail-dominated marsh occurs along most of the Ardenwood Creek alignment south of the Patterson Ranch Road culvert crossing. Pickleweed, saltgrass (*Distichilis spicata*), occur along the margins of the dense stands of cattail, together with ruderal grasslands, reflecting the perennial marsh and seasonal wetland conditions along the creek corridor. Depending on hydrologic conditions, seasonal wetland and ruderal grassland species include bristly ox-tongue (*Helminthotheca echioides*), foxtail barley (*Hordeum marinum*), rabbits foot grass (*Polypogon monspeliensis*), bur clover (*Medicago polymorpha*), cheeseweed (*Malva parviflora*), cranesbill

[11] WRA and NewFields. 2013. *Biological Resources Assessment Report, Ardenwood Creek Flood Protection and Restoration Project, Fremont, Alameda County, California*. Prepared for Alameda County Flood Control and Water Conservation District. October.

[12] Vollmar. August 2021. *Floristic and Special-Status Plant Surveys Ardenwood Creek Flood Protection and Restoration Project*.

[13] MIG. 2020. *Preliminary Delineation of Wetlands and Other Waters, Zone 5 Line P Improvements, Fremont, Alameda County, CA*. Prepared for Alameda County Flood Control and Water Conservation District. April.

(*Geranium dissectum*), dandelion (*Taraxacum officianale*), Italian thistle (*Carduus pycnocephalus*), wild mustard (*Hirshfeldia icana*), and red-stem filaree (*Erodium cicutarium*), among other species.

Pickleweed is dominant or co-dominant in the open to dense herbaceous layer of perennial marshland. Pickleweed mats generally occur in low-lying areas where the groundwater table is high. In the site vicinity, this species occurs with saltgrass (*Distichilis spicata*), alkali heath (*Frankenia salina*), and marsh jaumea (*Jaumea carnosa*). Pickleweed mats are part of the coastal salt marsh habitat found throughout the Bay. The North Marsh, north of DUST Trail, consists of dense stands of pickleweed more characteristic of coastal salt marsh natural community.

The combination of available surface water along Ardenwood Creek and large expanse of marshlands and grasslands throughout the site vicinity serves as wildlife habitat for a wide variety of species. Abundant mounds of pocket gopher were observed in upland areas at the upstream end of the project reach, together with signs of movement by California vole and other small mammals. Burrows of California ground squirrel occur at higher elevations and along levees where soil saturation does not preclude burrow construction. Evidence of river otter and a number of black-tailed deer were observed in cattail thickets upstream of the Patterson Ranch Road crossing. Abundant insect populations and small mammals serve as important prey for the numerous bird species known or suspect to occur in the area, including herons, egrets, red-winged blackbird, sparrows, swallows, marsh wren, northern harrier, white-tailed kite, red-shouldered hawk, and red-tailed hawk, among other species. Many of these species are considered to be of special-status, as described further below.

Ardenwood Creek is an earthen channel constructed in 1985. Flows discharge into Alameda Creek through a series of one-way tidal gates that only allow flow to discharge into Alameda Creek but prohibit flow from lower Alameda Creek from passing upstream into Ardenwood Creek. Species composition of the aquatic community, including resident fish, is expected to vary in response to variation in salinity gradients within the creek. Past fishery survey results suggest that Ardenwood Creek supports native and non-native fish species adapted to urban disturbance and a highly variable artificial hydrologic regime. Fish species observed include Sacramento sucker, common carp, white catfish, hitch, prickly sculpin, bluegill, and green sunfish, among other species. No special-status fish species are expected to occur along the project reach of Ardenwood Creek, as concluded in the Aquatic Resource Assessment contained in **Appendix A.**

The Alameda Creek estuary is tidally interconnected with near-shore waters of South San Francisco Bay. High salinity marine waters move upstream into the estuary during flood tides with a greater influence of downstream flow of freshwater into and through the estuary from Alameda Creek during ebb tides. The fish community of near-shore waters of South Bay in the immediate vicinity of the Alameda Creek estuary is characteristic of fish species composition found in other similar areas of the Bay and includes species such as north anchovy, Pacific herring, flatfish (e.g., California halibut, starry flounder, English sole), gobies, and perch. Juvenile and adult Chinook salmon and steelhead migrate through the South Bay to and from many South Bay tributaries. Longfin smelt juveniles and adults rear in the South Bay and may also spawn in South Bay tributaries. Green sturgeon and a large variety of other marine fish and invertebrates reside and forage as juveniles and adults in South Bay waters.

Special-Status Species

Special-status species[14] are plants and animals that are legally protected under the State and/or federal Endangered Species Acts or other regulations, as well as other species that are considered rare enough by the scientific community and trustee agencies to warrant special consideration, particularly with regard to protection of isolated populations, nesting or denning locations, communal roosts, and other essential habitat. Species with legal protection under the federal and State Endangered Species Acts often represent major constraints to development, particularly when they are wide-ranging or highly sensitive to habitat disturbance and where proposed development would result in a "take" of these species. "Take" as defined by the federal Endangered Species Act (ESA) means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" a threatened or endangered species. "Harm" is further defined by the USFWS to include the killing or harming of wildlife due to significant obstruction of essential behavior patterns (i.e., breeding, feeding, or sheltering) through significant habitat modifications or degradation. The CDFW also considers the loss of listed species habitat as "take," although this policy lacks statutory authority and case law support under the California Endangered Species Act (CESA).

A record search conducted of the CNDDB, together with other relevant information, indicates that occurrences of numerous plant and animal species with special-status have been recorded from or are suspected to occur in the west Fremont area and site vicinity. **Figure 8** shows the distribution of known occurrences of special-status plants and sensitive natural communities, and **Figure 9** shows special-status animal species and designated critical habitat within about a five mile radius of the site. The BRA provides a detailed review of the potential for occurrence of special-status species in the site vicinity, the conclusions of which are summarized below. Most of these are species associated with the undeveloped grasslands, marshlands, and aquatic habitat associated with Coyote Hills, lower Alameda Creek, and San Francisco Bay. The following provides a summary of the special-status plant and animals species known from the project vicinity and conclusions regarding presence or absence from the site.

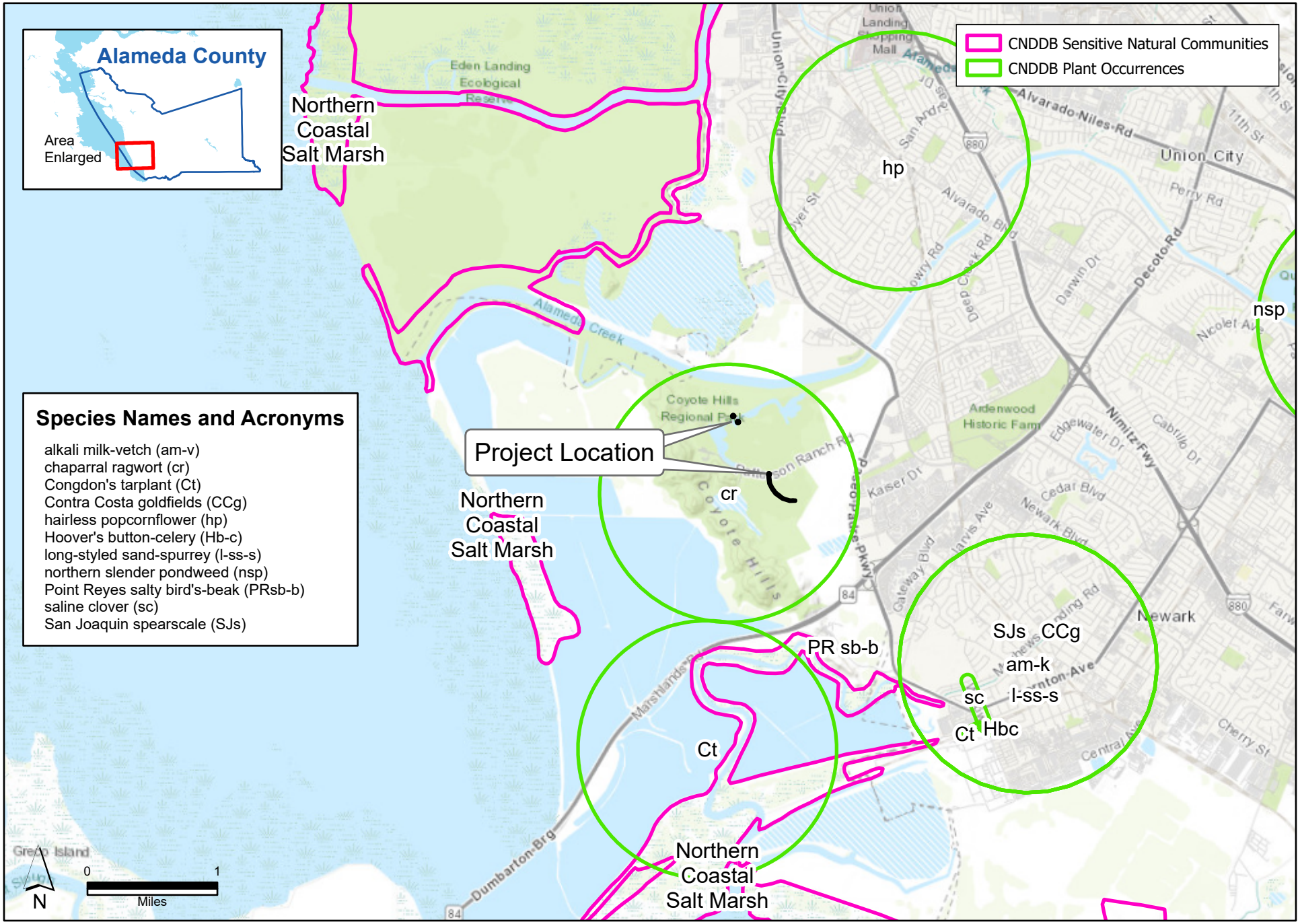
Special-Status Plant Species

A number of plant species with special status have been reported from the west Fremont area, and based on recorded geographic range and preferred habitat, numerous other species may potentially occur in the site vicinity. As indicated in Figure 9, 11 special-status plant species have been reported by the CNDDB in the surrounding area. These include: alkali milk-vetch (*Astragalus tener* var. *tener*), San Joaquin spearscale (*Extriplex joaquinana*), Congdon's tarplant (*Hemizonia parryi* ssp. *congdonii*), Point Reyes salty bird's beak (*Chloropyron maritimum* ssp. *palustre*), Hoover's button celery (*Eryngium aristulatum* var. *hooveri*), Contra

[14] Special-status species include: designated (rare, threatened, or endangered) and candidate species for listing by the CDFW; designated (threatened or endangered) and candidate species for listing by the USFWS; species considered to be rare or endangered under the conditions of Section 15380 of the California Environmental Quality Act Guidelines, such as those identified on lists 1A, 1B, and 2 in the *Inventory of Rare and Endangered Plants of California* (electronic edition) by the California Native Plant Society (CNPS); and possibly other species which are considered sensitive due to limited distribution or lack of adequate information to permit listing or rejection for State or federal status, such as those included on list 3 in the CNPS *Inventory* or identified as California "Species of Special Concern" (SSC) species by the CDFW. Animal species designated as SSC have no legal protective status under the CESA but are of concern to the CDFW because of severe decline in breeding populations and other factors.

Figure 8 Special-Status Plants and Sensitive Natural Communities

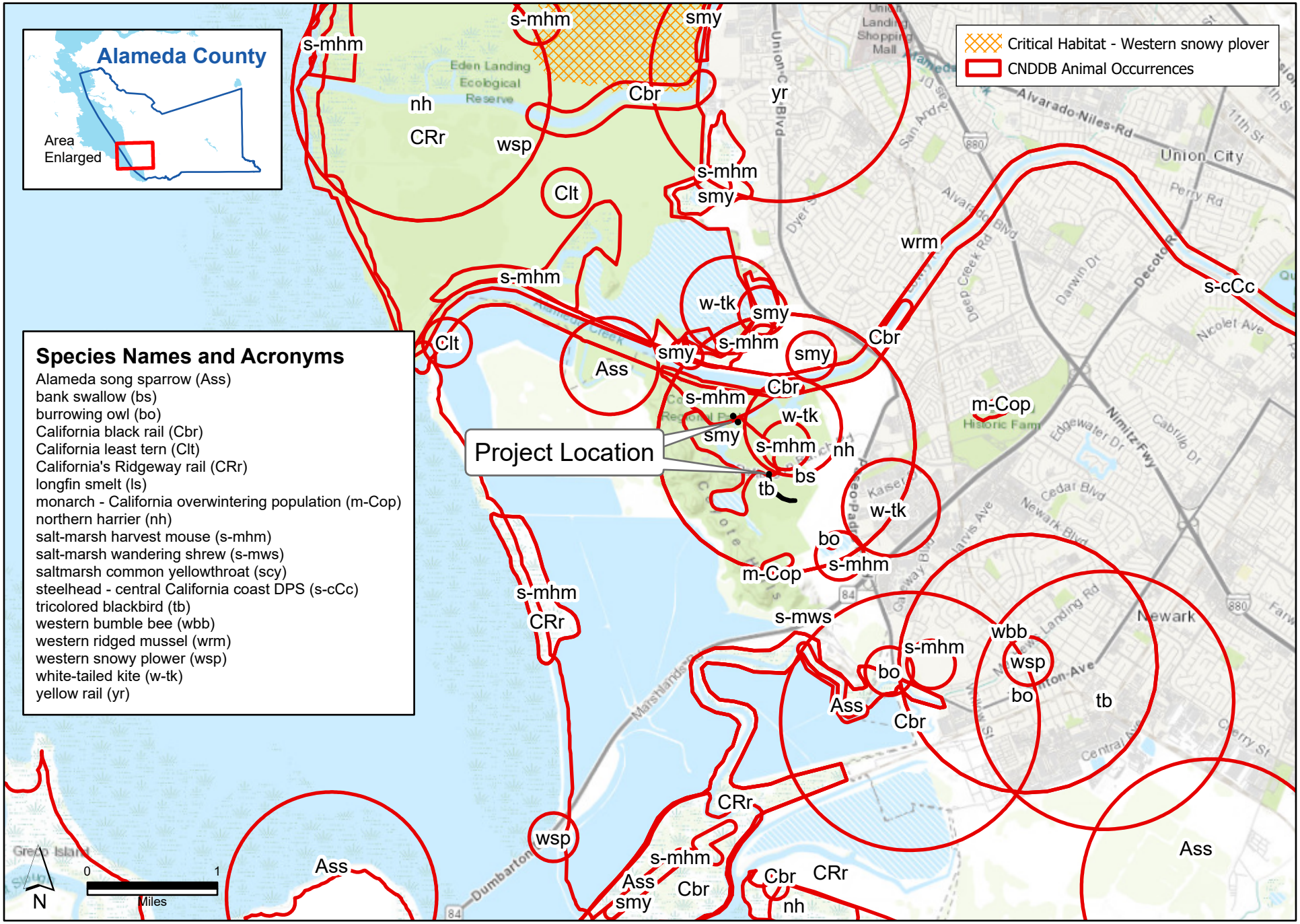
Ardenwood Creek Restoration Project



SOURCES: California Natural Diversity Database release date 2/27/2022 accessed on 3/8/2022; Basemap by: ESRI. Map produced by www.digitalmappingsolutions.com on 3/10/2022.

Figure 9. Special-Status Animals and Critical Habitats

Ardenwood Creek Restoration Project



SOURCES: California Natural Diversity Database release date 2/27/2022 accessed on 3/8/2022; Basemap by: ESRI. Map produced by www.digitalmappingsolutions.com on 3/10/2022.

Costa goldfields (*Lasthenia conjugens*), hairless popcornflower (*Plagiobothrys glaber*), chaparral ragwort (*Senecio aphanactis*), long-styled sand spurrey (*Spergularia macrotheca* var. *longistyla*), northern slender pondweed (*Stuckenia filiformis* ssp. *alpina*), and saline clover (*Trifolium hydrophilum*). However, systematic surveys were conducted in 2021 in accordance with CDFW survey guidelines for rare plants, and no occurrences of these or other special-status plant species were encountered on the site and surrounding area.

Special-Status Animal Species

As indicated in Figure 9, numerous special-status animal species have been reported from the west Fremont area. These consist primarily of special-status bird and mammal species, but include special-status fish, insects and invertebrates as well. The BRA reviewed the potential for occurrence of 66 special-status animal species that have been reported from the surrounding area, including those with mapped occurrences shown in Figure 9. Based on a habitat suitability analysis performed as part of the BRA, 19 special-status animal species were determined to have some potential for presence on the site based on available habitat, species range and known distribution, and the proximity of documented occurrences. Four of these special-status animal species are considered to have a high potential for occurrence in the site vicinity, and 15 were considered to have a moderate potential to occur in the site vicinity. In addition, western pond turtle (*Actinemys marmorata*) was observed along nearby Patterson Sough by the IS/MND biologist during field surveys conducted in summer of 2022 and a thorough review of the potential for special-status fish species was conducted given the proposed modifications to the aquatic habitat of Ardenwood Creek. The following provides a summary of the habitat suitability of the site vicinity for each of these special-status mammal, bird, reptile, insect and fish species.

Mammal Species

Salt marsh harvest mouse, Federal Endangered, (*Reithrodontomys raviventris*), State Endangered and CDFW Fully Protected. High Potential. Salt marsh harvest mouse (SMHM) is a relatively small rodent found only in suitable salt- and brackish-marsh habitat in the greater San Francisco Bay, San Pablo Bay, and Suisun Bay areas. SMHM is typically associated with pickleweed-dominated marshlands, though more recent studies have shown that SMHM is also present in areas with a mixture of pickleweed and mixed-vegetation (including native and non-native salt- and brackish-marsh species. SMHM prefers deep, dense vegetative cover between 11.8 and 23.6 inches (30 – 50 centimeters) in height, though there are indications that shorter stands (5.9 inches [15 centimeters] is the shortest commonly used) of pickleweed may also support SMHM. Another key habitat requirement for this species is upland or tidal refuge habitat, which is used to escape high tides and storm events.

Much of the site may provide suitable habitat for SMHM, except where cover is particularly sparse. Areas of open water, bare ground, and short (5 inches or less) vegetation within the site are not considered suitable SMHM habitat. Areas of pickleweed marsh, cattail marsh, California bulrush marsh, seasonal wetland, annual grassland, and ruderal herbaceous stands are all considered potential habitat for this species. A historical occurrence for this species is documented within the northern portion of the site vicinity, as indicated in Figure 9. Due to the presence and quality of

suitable habitat, and the historical documented occurrence of SMHM in the vicinity, there is a moderate to high potential for this species to occur within or near the site where suitable vegetative cover is present.

Salt marsh wandering shrew (*Sorex vagrans halicoetes*), CDFW Species of Special Concern. Moderate Potential. Found in medium high salt marshes (6-8 feet above sea level) of south San Francisco Bay. Salt marsh wandering shrews inhabit pickleweed marsh, which is inundated daily by tides. Salt marsh wandering shrew prefers salt marshes that provide dense cover, an abundant source of invertebrates for food, suitable nesting and resting substrate, and continuous ground moisture. Suitable middle marsh habitat frequented by this subspecies is usually inundated only by high tides and is characterized by 30-60 cm high pickleweed with driftwood and other debris resting directly on the vegetation. The surface debris provides nesting and resting sites and foraging habitat during dry periods. High salt marsh provides refuge for shrews during extremely high tides. Low marsh, dominated by cordgrass and subjected to daily tidal floods, is used as foraging habitat only during low tides. Although the site is not under tidal influence, this subspecies is known marshlands to the south and has a moderate potential for presence on the site where suitable vegetative cover is present.

Western red bat (*Lasiurus blossevillii*), CDFW Species of Special Concern, Western Bat Working Group (WBWG) High Priority. Moderate Potential. This species is highly migratory and broadly distributed, reaching from southern Canada through much of the western United States, including Marin County. Western red bat is typically solitary, roosting primarily in the foliage of trees or shrubs. Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas associated with riparian habitat (particularly willows, cottonwoods, and sycamores). Western red bats typically preys on insects and opportunistically forages in a variety of habitats, including open areas, and terrestrial and aquatic edge habitats. This species is quite tolerant of human activity, and it is common for individuals to utilize trees within an urban environment for roosting. The scattered riparian and upland trees within and immediately adjacent to the site may provide suitable riparian roosting habitat for the species. Additionally, the edge habitat along aquatic features provides suitable foraging habitat for the species. Thus, there is a moderate potential for this species to occur in the site vicinity.

Bird Species

White-tailed kite (*Elanus leucurus*), CDFW Fully Protected Species. High Potential. White-tailed kite occurs in low elevation grassland, agricultural, wetland, oak woodland, and savannah habitats. Riparian zones adjacent to open areas are also used. Vegetative structure and prey availability seem to be more important than specific associations with plant species or vegetative communities. Lightly grazed or ungrazed fields generally support large prey populations and are often preferred to other habitats. Preferred nest trees are extremely variable, ranging from small shrubs (less than 10 ft. tall) to large trees (greater than 150 ft. tall). White-tailed kite has been documented on multiple occasions in the site vicinity. The site provides potential nesting habitat in the nearby scattered trees and areas of scrub vegetation. Due to the presence of foraging and nesting habitat, there is a high potential for this species to occur in the site vicinity.

Northern harrier (*Circus cyaneus*), CDFW Species of Special Concern. High Potential. Harrier are residents of open wetlands, including marshy meadows; wet, lightly grazed pastures; old fields; freshwater and brackish marshes. They also frequent dry uplands, including upland prairies, mesic grasslands, drained marshlands, croplands, cold desert shrub-steppe, and riparian woodland throughout California. Harrier typically nest on ground in open (treeless) habitats in dense, often tall, vegetation. Preferred soil types include drained and nondrained wetlands as well as uplands. The site vicinity contains suitable nesting and foraging habitat for this species, which has been documented to occur in the area. Due to the presence of foraging and nesting habitat, and its documented use in the area, there is a high potential for this species to occur in the site vicinity.

California black rail (*Laterallus jamaicensis coturniculus*), State Threatened, CDFW Fully Protected, USFWS Bird of Conservation Concern. Moderate Potential. California black rail (CBR), a subspecies of the black rail, is a resident in California coastal salt and brackish marshes from Bodega Bay to Morro Bay, with additional populations known from inland freshwater marshes. CBR nests from mid-March through mid-July, with peak activity occurring in April and May. In the San Francisco Bay Area, CBR uses vegetation that varies from salt marshes dominated by pickleweed, saltgrass, and Pacific cordgrass to brackish marsh assemblages with variable proportions of salt marsh dominants (pickleweed, cordgrass), bulrush and tule (*Schoenoplectus* spp.), and cattail.

This species has been documented in the marshlands to the north and south of the site vicinity. CBR is not known to breed in the south San Francisco Bay,[15] so it is very unlikely to breed within the site vicinity. Suitable foraging habitat is present within the site vicinity, but higher quality habitat for this species can be found within areas of tidal influence along the shoreline of San Francisco Bay. Because of the proximity of the site to documented occurrences and the potentially suitable marsh and wetland habitat in the North Marsh area, this species has a moderate potential to forage in the site vicinity and is very unlikely to breed in the area.

California clapper (Ridgway's) rail, Federal Endangered, (*Rallus longirostris obsoletus*), State Endangered, CDFW Fully Protected. Moderate Potential. California clapper rail (CCR) or Ridgway's rail typically nets in low-lying portions of coastal wetlands and tidal sloughs dominated by cordgrass species (*Spartina* spp.), pickleweed, and gum plant. Factors important for breeding are well-developed sloughs and secondary tidal channels; extensive (dense, tall, lush) cordgrass stands; dense salt marsh vegetation for cover, nest substrate, and brooding areas; intertidal mudflats, gradually sloping banks of tidal channels, and cordgrass beds for foraging; abundant invertebrate food resources; and transitional vegetation at the upland edge of the salt marsh as a refuge during high tides. Nests are placed to avoid flooding by tides, yet in dense enough cover to be hidden from predators and to support a relatively large nest. Available habitat within the site vicinity has the potential to support CCR foraging and possibly nesting; however, higher quality habitat for this species is present in areas of tidal influence along the San Francisco Bay shoreline. Because of the proximity of the site to documented occurrences and the potentially suitable marsh and wetland

[15] Trulio, LA and J Evens. 2000. *California Black Rail in Goals Project. Baylands Ecosystem Species and Community Profiles: Life histories and environmental requirements for key plants, fish and wildlife.* Prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. PR Olofson, editor. San Francisco Bay Regional Water Quality Control Board, Oakland, CA.

habitat located within the northern portions of the site, CCR has a moderate potential to occur in the area.

Long-billed curlew (*Numenius americanus*), CDFW Species of Special Concern. Moderate Potential. The long-billed curlew is a winter visitor to large coastal estuaries, upland herbaceous areas, and agricultural lands. Within California, the species nests only in the northeastern portion of the state in wet meadow habitats. In the winter, the species utilizes coastal estuaries, open grasslands, and croplands throughout California. Local bird watchers and ornithologists have documented occurrences in the vicinity of the site. The site vicinity provides potential foraging habitat along the margins of aquatic features and adjacent grasslands. Additionally, the site vicinity is within close proximity to high quality foraging habitat along the shoreline of San Francisco Bay that remains under tidal influence. Because of this there is a moderate potential for individuals to utilize the site vicinity for foraging; however, the species does not breed in the vicinity of San Francisco Bay.

Allen's hummingbird (*Selasphorus sasin*), USFWS Bird of Conservation Concern. Moderate Potential. Allen's hummingbird is found in a wide variety of habitats that provide nectar-producing flowers. This species has been documented breeding throughout much of western Alameda County. The site vicinity does not support a substantial number of nectar-producing flowers; however, overhanging trees and dense vegetation may provide suitable nesting habitat for the species. Thus, there is a moderate potential for this species to occur within the site vicinity.

Short-eared owl (*Asio flammeus*), CDFW Species of Special Concern. Moderate Potential. Short-eared owl typically is found in tall grasslands and emergent wetlands. While documented breeding locations in Alameda County are limited for this species, Coyote Hills Regional Park has supported nesting in previous years. Within the site vicinity, seasonal wetlands and nearby annual grasslands and small shrubs provide potentially suitable breeding and foraging habitat for this species. Thus, there is a moderate potential for this species to occur within the site vicinity.

Burrowing owl (*Athene cunicularia*), CDFW Species of Special Concern; USFWS Bird of Conservation Concern. Moderate Potential. Burrowing owl typically favors flat, open grassland or gentle slopes and sparse shrub-land ecosystems. These owls prefer annual or perennial grasslands, typically with sparse or nonexistent tree or shrub canopies; however, they also colonize debris piles and old pipes. Burrowing owl exhibits high nest fidelity and usually nest in abandoned burrows of ground squirrels or pocket gophers. The species has been documented within Coyote Hills Regional Park and to the south of the area. Although burrow habitat was not observed in high density within the site vicinity, habitat within the southeastern portion in particular may be suitable for the species due to the presence of areas with low vegetation and available burrow. Thus, there is a moderate potential for this species to occur within the site vicinity.

Loggerhead shrike (*Lanius ludovicianus*), CDFW Species of Special Concern, USFWS Bird of Conservation Concern. Moderate Potential. A common resident of lowlands and foothills throughout California, this species prefers open habitats with scattered trees, shrubs, posts, fences, utility lines or other perches. Nests are usually built on a stable branch in a densely-foliaged shrub or small tree. Though this species eats mostly arthropods, they also take amphibians, small reptiles, small mammals or birds, and is also known to scavenge carrion. Suitable foraging habitat and

potential nesting habitat for this species are present in the site vicinity, and there is a moderate potential for this species to be present.

Salt marsh common yellowthroat (*Geothlypis trichas sinuosa*), USFWS Bird of Conservation Concern, CDFW Species of Special Concern. High Potential. This subspecies of the common yellowthroat is found in freshwater marshes, coastal swales, riparian thickets, brackish marshes, and saltwater marshes. Its breeding range extends from Tomales Bay in the north, Carquinez Strait to the east, and Santa Cruz County to the south. This species requires thick, continuous cover such as tall grasses, tule patches, or riparian vegetation down to the water surface for foraging and prefers willows for nesting. Thick emergent aquatic vegetation throughout much of the site vicinity has the potential to support nesting habitat for this species. Given the abundance of suitable cover, there is a high potential for the species to be present in the site vicinity.

Bryant's savannah sparrow (*Passerculus sandwichensis alaudinus*). CDFW Species of Special Concern. **Moderate Potential.** Bryant's savannah sparrow, a subspecies of the common and widespread savannah sparrow (*P. sandwichensis*), is an endemic resident in the coastal California fog belt. It typically occupies upper tidally-influenced habitats, often found where pickleweed communities transition into grassland. Nesting typically occurs in vegetation on or near the ground, including along roads, levees, and canals. Suitable nesting habitat in the available in the site vicinity where marsh habitat merges into grassland, and along adjacent grassland edge habitat such as those bordering roadways, trails, and levees. There is a moderate potential for this species to occur within the site vicinity.

Alameda Song Sparrow (*Melospiza melodia pusillula*), CDFW Species of Special Concern, USFWS Bird of Conservation Concern. Moderate Potential. This songbird nests in tidal marsh vegetation and adjacent weedy vegetation on levees. It occurs in the salt marshes of south San Francisco Bay and requires low, dense vegetation such as gumplant for cover and nesting. It tends to avoid areas where water is stagnant and/or tidal flow is obstructed.[16] As with all song sparrow subspecies, dense vegetation is required for nesting sites, for song perches, and as cover from predators. The site vicinity provides suitable foraging habitat; however, nesting habitat quality may be diminished due to tidal muting. Despite this, nest habitat structure is available throughout much of the site vicinity. There is a moderate potential for this species to occur within the site vicinity.

Tricolored blackbird (*Agelaius tricolor*), State-listed threatened, USFWS Bird of Conservation Concern. Moderate Potential. Tricolored blackbird is common locally in the Central Valley and along coastal California. This species breeds near fresh water, preferably in emergent wetland with tall, dense cattails or tules, but also in thickets of willow, blackberry, wild rose, and tall herbs. It feeds in grassland and cropland habitats. This species is highly colonial; and often nests in large groups. While documented breeding sites in Alameda County are limited for this species, Coyote Hills Regional Park has supported nesting for this species in previous years. Suitable foraging habitat is available within grassland portions of the site vicinity, and dense emergent vegetation located along

[16] Shuford, WD. 1993. The Marin County Breeding Bird Atlas: A Distributional and Natural History of Coastal California Birds. California Avifauna Series 1. Bushtit Books, Bolinas, CA.

freshwater aquatic habitat could support breeding for the colonial nester. There is a moderate potential for this species to occur within the site vicinity.

Nuttall's woodpecker (*Picoides nuttallii*), USFWS Bird of Conservation Concern. Moderate Potential. Nuttall's woodpecker typically occur in lowland woodlands throughout California, west of the Sierra Nevada. This species is associated with intact oak and riparian woodlands, rarely in conifers, and is a primary cavity nester. This species has been documented breeding throughout much of Alameda County, and local bird watchers and ornithologists have documented occurrences in the vicinity of the site vicinity. Riparian woodland in the site vicinity has the potential to support nesting and foraging habitat for the species. Thus, there is a moderate potential for this species to occur within the site vicinity.

Ferruginous hawk (Buteo regalis), CDFW Species of Special Concern; USFWS Bird of Conservation Concern. Moderate Potential. Ferruginous hawk breeds in the semiarid grasslands of the Great Plains. This species is a winter visitor to California and occupies open terrain including grasslands, agricultural fields, and deserts. Grassland and arid areas of California, Arizona, and New Mexico are used heavily where prairie dogs, rabbits, or pocket gophers are abundant. While the San Francisco Bay Area is outside of the documented breeding range of this species, potential foraging habitat is present in the site vicinity. The species has a moderate potential to occur within the site vicinity during its wintering period.

Reptile Species

Western Pond Turtle (*Actinemys marmorata*), CDFW Species of Special Concern. Moderate Potential. Western pond turtles occur in a wide variety of aquatic habitats, including ponds, lakes, marshes, rivers, streams, and canals that typically have a rocky or muddy bottom and contain stands of aquatic vegetation. The presence or absence of pond turtles at a given aquatic site is largely dependent on the availability of suitable basking sites and adjacent upland habitat for egg-laying (e.g., sandy banks or grassy open fields) and over-wintering. Nests are typically dug in dry substrate with a high clay or silt fraction since the female moistens the site where she would excavate the nest prior to egg-laying. Hatchlings require shallow water habitat with relatively dense submergent or short emergent vegetation in which to forage. Western pond turtles were observed along Patterson Slough just northeast of the site vicinity, and there remains a possibility that they may be present along Ardenwood Creek where deep enough to escape predators. There is a moderate potential for the species to occur within the site vicinity.

Insect Species

Monarch butterfly (*Danaus plexippus*). CDFW Special Status Invertebrate. Moderate Potential. This large, showy butterfly is found throughout the United States, southern Canada, and Central America. It also occurs in parts of South America and other continents. In North America, this species spends spring and summer months breeding and foraging across much of its range. Monarch butterfly generally uses milkweed (*Asclepias* spp.) for both breeding and nectaring, although nectar may also be obtained from a variety of additional plant species. From August to October, monarchs migrate thousands of miles to winter roost sites located along the California Coast and central Mexico. Winter roost sites are located in wind-protected tree groves, with nectar and water sources

nearby. Roost sites for this species have been documented within Coyote Hills Regional Park, as well as to the north and east of the area. Larger wind-protected tree groves at Ardenwood Historic Park have the potential to support roosting habitat for this species. There is a moderate potential for the species to occur within the site vicinity.

Fish Species

Aquatic habitat along Ardenwood Creek and downstream areas has been altered by operation of existing tide gates, culverts, and other modifications which has reduced tidal prism and limits the connection to lower Alameda Creek and the San Francisco Bay. Upstream aquatic habitat has also been highly modified by urban development. Because of these factors, and their impact to aquatic habitat, no special-status fish species are expected to occur along the project reach of Ardenwood Creek, as concluded in the Aquatic Resource Assessment contained in Appendix A.

These include absence of suitable habitat for green sturgeon (*Acipenser medirostris*), tidewater goby (*Eucyclogobius newberryi*), delta smelt (*Hypomesus transpacificus*), steelhead - central California coast DPS (*Oncorhynchus mykiss*), and longfin smelt (*Spirinchus thaleichthys*). While these species are unlikely to occur, the hydrologic connection between the site and potentially occupied downstream habitat such as lower Alameda Creek was thoroughly addressed in the Aquatic Resource Assessment and additional information on special-status fish species and associated aquatic habitats can be found in Appendix B.

Regulated Waters

The CDFW, U.S Army Corps of Engineers (Corps), and San Francisco Regional Water Quality Control Board (SFRWQCB) have jurisdiction over modifications to riverbanks, lakes, stream channels and other regulated waters. Jurisdiction of the is established through provisions of Section 404 of the Clean Water Act, which prohibits the discharge of dredged or fill material into “waters of the U.S.” without a permit. The SFRWQCB jurisdiction is established through Section 401 of the Clean Water Act, which requires certification or waiver to control discharges in water quality whenever a Corps permit is required under Section 404 of the Clean Water Act, and State waters as regulated under the Porter-Cologne Act. Jurisdictional authority of the CDFW over wetland areas is established under Sections 1600-1607 of the State Fish and Game Code, which pertains to activities that would disrupt the natural flow or alter the channel, bed or bank of any lake, river or stream.

Although definitions vary to some degree , wetlands are generally considered to be areas that are periodically or permanently inundated by surface or ground water and support vegetation adapted to life in saturated soil. Wetlands are recognized as important features on a regional and national level due to their high inherent value to fish and wildlife, use as storage areas for storm and flood waters, and water recharge, filtration, and purification functions. Where wetland vegetation is absent, federally regulated waters occur along stream channels below the Ordinary High Water Mark (OHWM) and are described as “other waters of the U.S.” State waters regulated by the RWQCB and CDFW extend to the top of bank or limits of riparian vegetation beyond the top of bank along natural drainage channels, whichever is greater. Modifications to regulated waters on the site, including flood control modifications and restoration would require authorizations from each of these three agencies.

Based on the results of the PWD, most of the site along the Ardenwood Creek corridor are regulated waters with the exception of the uplands along the Patterson Ranch Road and trail crossings. The extent of potential regulated waters on the site are indicated in **Figure 10**. A total of 5.66 acres of potential regulated waters occur along the Ardenwood Creek corridor on the site.
These consist of an estimated 3.56 acres of wetlands and 2.10 acres of unvegetated other waters. The PWD has been submitted for verification by the Corps and appears provides an accurate mapping of the extent of regulated waters on the site based on the review conducted by the IS/MND consulting biologist.

Project Controls, Potential Impacts and Mitigation Measures

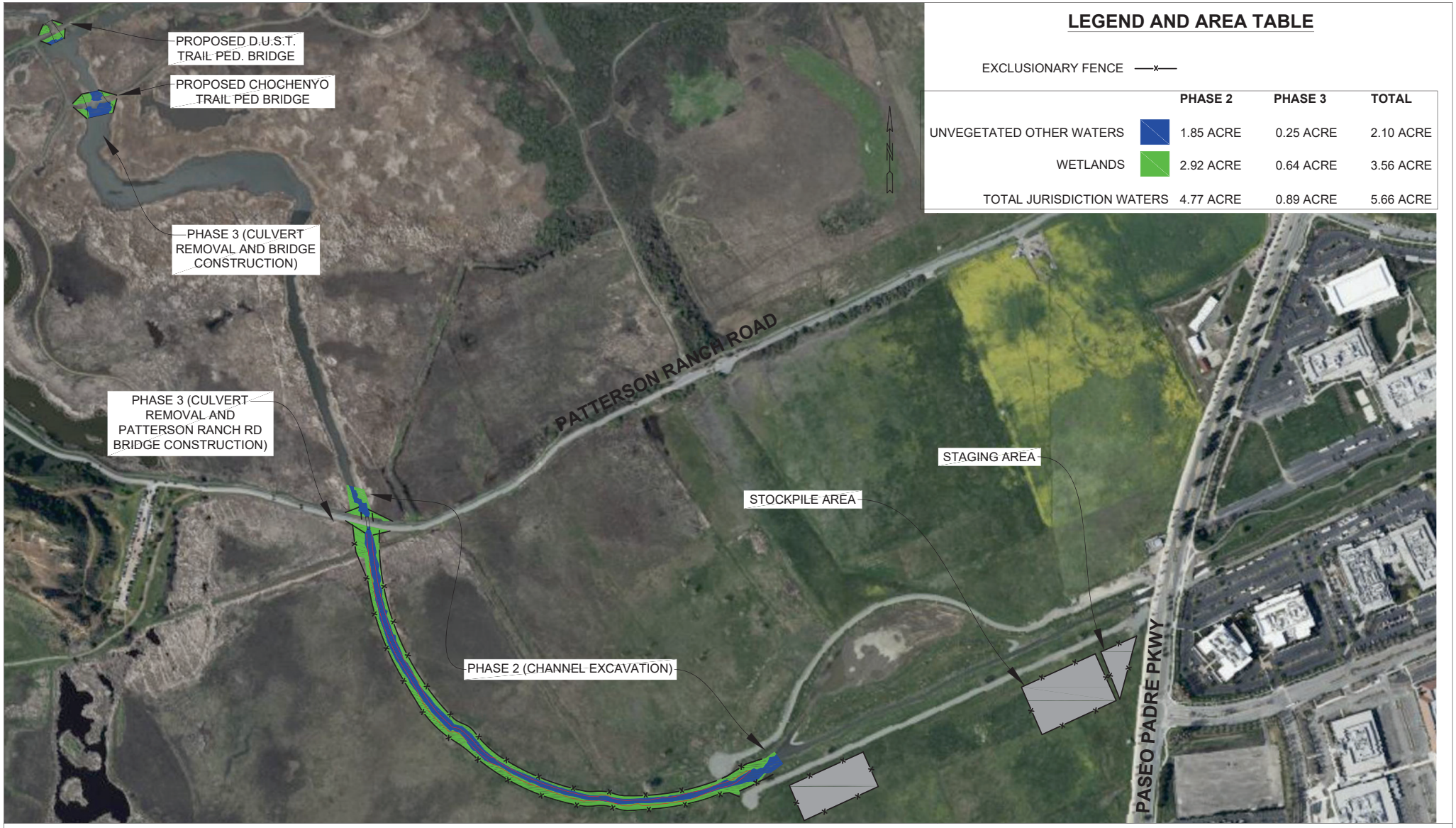
Project Controls

The ACFCWCD would implement detailed Project Controls to avoid and minimize potential adverse effects of the proposed Project. These Project Controls would serve to address the potential for presence of nesting birds within the construction zone, modifications to regulated waters, and methods to minimize potential adverse effects on aquatic habitat and downstream waters. These consist of the following Project Controls (PC):

PC-1: Worker training and construction monitoring. Appropriate measures shall be taken to minimize impacts on regulated waters and to prevent inadvertent take of special-status wildlife during construction. This shall include the following:

- Prior to initiation of grading or vegetation removal, a qualified biologist would be retained to train workers over the regulations related to wetlands and special-status species, and the possible risk of inadvertent take in advance of construction. The qualified biologist is someone knowledgeable about the biology and regulations regarding protected species and jurisdictional waters known or suspected to occur in or adjacent to the site, including California clapper (Ridgway's) rail, California black rail, salt marsh common yellowthroat, Alameda song sparrow, salt marsh harvest mouse, and salt marsh wandering shrew, among other salt and brackish water marsh-dependent species.

- The qualified biologist would oversee installation of construction exclusion fencing and conduct preconstruction surveys for nesting birds, small mammals, western pond turtle, fish and other aquatic organisms, and other wildlife species, as necessary.
- The worker training would be conducted prior to starting work on the Project and upon the arrival of any new worker. The training program would include a description of protected species and their habitat needs, any known occurrences in the Project vicinity, an explanation of the status of these species and their protection under state and federal legislation, a description of regulated waters and need to follow all regulatory authorizations, a list of measures being taken to avoid and minimize impacts to protected species during the work, and procedures to follow if a protected species is suspected to be present in the work area.



Alameda County Flood Control & Water Conservation District

QUESTA ENGINEERING CORP.

FIGURE 10
REGULATED WATERS
ARDENWOOD CREEK

- Fact sheets containing the information presented during the worker training program would be provided to the Project Foreman and would be kept on-site for the duration of construction.

- The qualified biologist would train the Project Foreman to serve as an Environmental Monitor, making sure workers are following all required controls, inspecting trenches or ditches for signs of protected species, and ensuring the wildlife exclusion fencing called for in PC-5 is maintained.

- If excavations or trenches are not backfilled on the same day as excavation, they would be covered to prevent small mammals from falling in. If a trench or excavation cannot be covered, they would be provided with exit ramps suitable for small mammals to escape on their own.

- A record of all personnel trained during the project would be maintained for compliance verification.

PC-2: Nest Avoidance. Adequate measures would be taken to avoid inadvertent take of bird nests protected under the federal Migratory Bird Treaty Act and State Fish and Game Code when in active use. Generally, construction work generating noise and/or vibration and requiring extensive removal of existing vegetative cover would be restricted to the period between September 1 and January 31 to avoid the nesting season for California clapper (Ridgway's) rail and other native birds. Where staging and other geographically limited mobilization activities, such as installation of dewatering related facilities, and construction of access ramps at the upstream and downstream end of the channel work areas (not channel grading) are to occur during the nesting season, appropriate preconstruction surveys and nest avoidance controls would be taken. This would be accomplished by taking the following steps.

- If the geographically limited activities for mobilization and staging, are proposed during the nesting season (February 1 to August 31), including any limited vegetation removal necessary for staging and preparation for dewatering, a focused survey for native nesting birds would be conducted by a qualified biologist within 7 days prior to the onset of construction to determine whether any active nests are present in the construction and surrounding area within 100 feet of proposed construction. The survey would be re-conducted any time construction has been delayed or curtailed for more than 7 days during the nesting season.
- If no active nests are identified during the construction survey period, or activities are initiated during the non-breeding season (September 1 to January 31), construction may proceed with no nest-related restrictions.

- If bird nests are found, an adequate setback or buffer would be established around the nest location and construction activities would be restricted within this no-disturbance zone until the qualified biologist has confirmed that any young birds have fledged and are able to

function outside the nest location. Required setback distances for the no-disturbance zone would be based on input received from the CDFW, and the setback may vary depending on species and sensitivity to disturbance. The no-disturbance zone would be fenced or flagged as necessary to avoid incursion if construction is to be initiated elsewhere on the site during the nesting season.

- If any vegetation removal is necessary within the geographically limited area, it would be accomplished using the procedures defined below in PC-6.

- A report of findings would be prepared by the qualified biologist and submitted to the ACFCWCD for review and approval prior to initiation of construction during the nesting season (February 1 to August 31). The report would either confirm absence of any active nests or should confirm that any young are located within a designated no-disturbance zone and construction can proceed. No report of findings is required if construction is initiated during the non-nesting season (September 1 to January 31) and continues uninterrupted according to the above criteria.

PC-3: Implementation of BMPs. A Storm Water Pollution Prevention Plan (SWPPP) and erosion control best management practices (BMPs) would be developed and implemented to minimize wind or water-related erosion during construction. The ACFCWCD would include provisions in construction contracts that specify Impact Avoidance and Minimization Measures (AMMs) to protect sensitive areas and wildlife. Protective measures would include, at a minimum:

- No discharge of pollutants from vehicle and equipment cleaning is allowed into any storm drains or water courses.

- Vehicle and equipment fueling, and maintenance operations must be at least 100 ft away from the channel (water courses). Concrete wastes are collected in washouts and water from curing operations is collected and disposed of and not allowed into water courses.

- Spill containment kits would be maintained on-site at all times during construction operations and/or staging or fueling of equipment.

- Dust control would be implemented, including use of water trucks and tackifiers to control dust in excavation and fill areas, covering temporary access road entrances and exits with rock (rocking), and covering temporary stockpiles when weather conditions require.

- Coir rolls or straw wattles would be installed along or at the base of slopes during construction to capture sediment.

- Protection of graded areas from erosion would be achieved using a combination of silt fences, fiber rolls along toes of slopes or along edges of designated staging areas, and erosion control netting (such as jute or coir) as appropriate on sloped areas.

PC-4: Construction Restrictions. The following restrictions would be implemented to avoid adversely affecting sensitive habitats and harm or harassment to wildlife during construction:

- A speed limit of 15 miles per hour (mph) at the site would be followed by all construction equipment and vehicles.

- Temporary construction areas used for construction access, staging, storage, and parking areas, would be located outside of any designated environmentally sensitive habitat or at environmentally cleared areas outside of the site and would be secured with wildlife exclusion fencing, as necessary.

- Access routes and the number and size of staging and work areas would be limited to the minimum necessary to construct the proposed project. Routes and boundaries of roadwork would be clearly marked prior to initiating construction or grading.

- All food and food-related trash items would be enclosed in sealed trash containers and removed completely from the site at the end of each day.

- No pets from project personnel would be allowed anywhere at the site during construction.

- Work hours would be limited to half an hour after sunrise to half an hour prior to sunset. Night work would be avoided to the maximum extent feasible and would only be performed with the qualified biologist present.

- All equipment would be maintained such that there would be no leaks of automotive fluids such as gasoline, oils or solvents and a Spill Response Plan would be prepared. Hazardous materials such as fuels, oils, solvents, etc. would be stored in sealable containers in a designated location that is at least 100 ft from wetlands and aquatic habitats.

- All pipes, hoses, or similar structures less than 12 inches in diameter would be closed to prevent animal entry or would be stored in the designated staging area that has been inspected by the qualified biologist and secured with wildlife exclusion fencing. All construction pipes or similar structures greater than 2 inches in diameter stored at the site overnight would be inspected for wildlife before the pipe or similar structure is buried, capped, used, or moved.

- Servicing of vehicles and construction equipment including fueling, cleaning, and maintenance would occur at designated locations away from regulated waters and other sensitive habitats. Staging areas may occur closer to the project activities as required.

- During channel dredging and construction involving use of equipment in or adjacent to the Ardenwood Creek channel, sand bags would be stockpiled on site so that they may be immediately filled and placed around any spill. In addition, any spills not contained within the dredging and construction area would immediately be isolated from the active channel.

- If any mouse or shrew is observed at any time during construction, work would not be initiated or would be stopped immediately until the animal leaves the vicinity of the work area of its own volition. The qualified biologist would direct the contractor on how to

proceed accordingly. Neither the qualified biologist, Environmental Monitor, nor any other persons at the site are authorized to pursue, capture, handle, or harass any potential protected species observed.

- The qualified biologist would be notified immediately by the contractor if any suspected salt marsh harvest mice, California clapper (Ridgway's) rail, and/or California black rail are observed, injured, killed, or entrapped and all work would stop in the vicinity. The qualified biologist would verify species, determine whether it is of special-status and how to proceed. If any State and/or federally-listed species are encountered during construction, such as salt marsh harvest mouse, California clapper rail, California black rail, all construction would stop, and the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife would be consulted and a plan to ensure no inadvertent take would be defined in advance of proceeding.

- The USFWS and CDFW would be contacted within 24 hours if any confirmed salt marsh harvest mice, California clapper (Ridgway's) rail, California black rail or other state and/or federally-listed species are killed, injured, or entrapped.

PC-5: Temporary Construction Exclusion Fencing and Buffer Zones. Prior to the start of construction within areas containing sensitive biological resources, the qualified biologist would oversee installation of temporary construction exclusion fencing to delineate the limits of construction and exclude small mammals and other wildlife from the construction zone. If required, setback or non-disturbance buffer zones around sensitive resources would be established and monitored by the qualified biologist. The Wildlife Exclusion Fence (WEF) would be installed in accordance with project plans and specifications, with adjustments made as necessary under the direction of the qualified biologist. This shall be accomplished with the following controls and tasks: The WEF may double as erosion control fencing, but fencing must be buried a minimum of six inches below existing graded to prevent small mammals from digging underneath it.

The WEF must be at least three (3) feet in height with vertical stakes installed on the roadway side of the fence at a minimum of six (6) foot intervals to prevent collapse for the duration of construction and equipped with a minimum six (6) inch smooth, continuous top that small mammals cannot climb over, and preferably have a minimum three (3) inch fold directed away from the construction zone that helps minimize the risk of small mammals climbing over the structure.

Commercially available WEF is available which are equipped with a flange to prevent small mammals from climbing over them, such as E-Fence™ Wildlife Exclusion Fence by ERTEC Environmental Systems, but should meet the height, buried depth and flange details.

The qualified biologist would have the authority to direct field adjustments on the location, corrective design, and necessary maintenance of the fencing based on site-specific habitat conditions.
The WEF would remain in place for the duration of construction and repaired within 24 hours of the initial observance of damage. Work would not continue within 300 feet of any damaged fencing

until the WEF is repaired and the work zone surveyed by the qualified biologist to ensure that no small mammals have entered and are at risk.

PC-6. Prior to ground disturbance and installation of the Wildlife Exclusion Fencing, vegetation would be carefully removed from the construction impact footprint by hand and supervised mowing under the supervision of the qualified biologist. This shall be accomplished according to the following controls and tasks:

- Clearing of vegetation would be completed at least two days before installation of the WEF called for in PC-5 to create conditions that are not conducive to occupation by birds and small mammals.

- Clearing of vegetation would be initiated from the limits of pavement or disturbed uplands and proceed outward away from the roadway or trail, to allow for escape of any wildlife towards the nearby undisturbed habitat.

- Before vegetation removal, the qualified biologist would first conduct a thorough nest and small mammal search within areas of vegetation to be removed. If active small mammal nests with potential to be salt marsh harvest mouse nests are observed, a 50-foot buffer would be established around the nest until the qualified biologist has determined that any young are independent of the nest. Vegetation would then be removed using only hand tools in the vicinity of the nest to carefully remove vegetation down to bare ground.

- The Qualified Biologist would determine in the field which areas can be cleared using non-motorized hand tools vs. walk behind mowing equipment. No driven equipment would be used in vegetation clearing. In general areas of less than 20% cover by pickleweed can be cleared using walk behind equipment and areas with more than 20% pickleweed cover would be cleared using hand tools.

- For areas cleared by hand, vegetation would be cut to the existing ground surface and immediately removed from the site. The treated area would be raked, and any remaining plant material or other debris removed to avoid creating any cover which could provide shelter for small mammals and other wildlife. The cleared vegetation and debris would be hauled off-site and disposed of properly and shall not be left overnight anywhere in the construction zone except the designated stockpile area to prevent attracting wildlife.

- For areas cleared using equipment, the qualified biologist would inspect the vegetation in advance of cutting to make sure no small mammals are present. Cutting would be accomplished through an initial cut at least six inches above the ground surface. For this step, vegetation may be removed using walk-behind brush hogs with blades set at the highest setting; use of weed whackers is also acceptable. After vegetation in one area has been cut down to 6 inches in height, it would be thoroughly inspected by the qualified biologist and left for two nights before the second step is initiated. The second step of vegetation removal would involve the use of weed whackers to remove vegetation down to stubble or bare ground. The cut vegetation would be removed from the site under the

supervision of the qualified biologist. Heavy equipment is permissible to assist in removal of cut vegetation when performed under supervision of the qualified biologist in which case he tires/tracks would not be allowed to roll over un-cleared ground and the equipment speed would not exceed walking speed.

PC-7. Proper Use of Erosion Control Devices. Only natural fibers such as jute, coconut, twine or other similar fibers would be used for erosion control to prevent species from becoming entangled, trapped, or injured, in erosion control materials that use plastic or synthetic monofilament netting.

PC-8: Obtaining Agency Authorizations. The ACFCWCD would obtain required authorizations from the Corps, SFRWQCB and CDFW for modifications to regulated waters on the site. This includes a Section 404 Permit from the Corps, a Section 401 Certification from the RWQCB, and a Streambed Alteration Agreement from the CDFW. The ACFCWCD would obtain all legally required permits or other authorizations from the USFWS, NOAA Fisheries, and CDFW for the potential "take" of species protected under the Endangered Species Acts, if required. All conditions and measures contained in the regulatory agency authorizations would be implemented as part of the Project.

PC-9. Channel protection. ACFCWCD would isolate in-channel construction areas from the active creek channel with sand bags, fiber mats, cofferdams, or other methods prior to channel dredging or construction. A detailed dewatering plan would be provided to CDFW for review and approval prior to construction.

PC-10. Riparian vegetation. ACFCWCD would access the Ardenwood Creek channel via areas where no woody riparian vegetation would be affected.

PC-11. Runoff. ACFCWCD would control potential downstream runoff from the dredging and construction sites with sand bags, fiber mats, cofferdams, closure and management of the tidal gates, or other methods.

PC-12. Re-grading and revegetation. ACFCWCD would restore disturbed areas to pre-project contours unless otherwise specified. Disturbed areas not improved with roadway or trail features would be reseeded with a suitable mix of native species. Disturbed habitat would be allowed to revegetate naturally and is expected to have cover similar to pre-disturbance conditions within 1-2 years after completion of construction.

PC-13. Fish relocation. Following installation of the upstream cofferdam to isolate the construction site from the active channel, a qualified fisheries biologist and team would conduct a fish relocation program using a beach seine held across the Ardenwood Creek channel and moved downstream through the construction reach to herd resident fish out of the area where dredging and construction would occur followed by closure of the downstream cofferdam to isolate fish from the construction reach prior to initiation of construction activities. Any western pond turtles encountered during the fish relocation program would also be relocated by the qualified biologist outside the construction zone to nearby suitable aquatic habitat. It is expected that the construction reach would not be dewatered completely.

Comments to Questions

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

Less than significant impact. The proposed Project would occur in sensitive wetlands habitat known to support several special-status species and could have potentially significant impacts if adequate avoidance and minimization measures are not undertaken. Construction access would require removal of existing wetland vegetation over an estimated 3.56 acres during the course of construction along the Ardenwood Creek corridor, existing aquatic habitat would be dredged affecting an estimated 2.1 acres of unvegetated other waters, and construction equipment would move through sensitive habitat areas. These activities pose a risk of injury or loss of individual special-status species, or disruption of important nesting activity if careful construction restrictions are not followed. Of particular concern are potential impacts to state and/or federally listed species such as salt marsh harvest mouse, salt marsh wandering shrew, California clapper rail, and California black rail, among other species.

However, the Project Controls listed above would serve to address the risk of potential adverse impacts on special-status species and native birds protected under the Migratory Bird Treaty Act and State Fish and Game Code. Vegetation removal and grading would be restricted outside the bird nesting season (from February 1 to August 31), serving to avoid the primary concern over disruption to possible nesting activity of special-status rail species and other native birds when nests are in active use. Other Project Controls would restrict the timing of construction to daylight hours, would ensure that any small mammals encountered are allowed to disperse from the construction area, and that construction activities do not create new risks to special-status species associated with coastal salt marsh and brackish marsh habitats which characterize the area. These include careful controls on initial vegetation removal, installation of Wildlife Exclusion Fencing to prevent wildlife from moving into the construction zone and conduct of preconstruction surveys by a qualified biologist who would monitor construction activities and verify that no special-status species are directly affected. Construction activities would temporarily disrupt foraging habitat for special-status and more common wildlife species, but suitable habitat is available in the surrounding areas and this temporary impact would be less than significant.

As part of the proposed Project cofferdams would be installed in Ardenwood Creek to reduce water levels in the creek to facilitate channel dredging and construction. The cofferdams would not result in a complete dewatering of the creek channel due to high groundwater levels. A bypass pipeline would be installed to help convey water in the creek from the upstream cofferdam to a discharge location downstream of the lower cofferdam. The cofferdams would serve to contain water disturbed during dredging and construction which, in combination with the existing tidal gates, would control the discharge of water containing elevated turbidity and potential contaminants from being discharged into lower Alameda Creek and passing downstream into the estuary and out into San Francisco Bay. Daily turbidity water quality monitoring upstream and downstream of the

construction site would confirm whether turbidity levels remain acceptable or whether any increase needs corrective action by the contractor.

To minimize and avoid adverse effects of the proposed Project activities on resident fish inhabiting the work zone within Ardenwood Creek, a fish relocation would occur as part of cofferdam installation. During cofferdam installation the upstream cofferdam would be installed followed by fishery biologists using a ¼ inch mesh beach seine stretched across the creek channel moving from upstream downstream through the entire reach of the creek to be isolated to heard resident fish out of the construction area. The lower cofferdam would then be closed to isolate the construction reach of the creek before dredging or construction begins. The fish relocation would be performed as a BMP under the direction of a qualified fishery biologist. Water levels in the construction reach would be reduced but not dewatered completely to facilitate channel dredging and removal of sediment and cattails.

Physical disturbance during channel dredging and construction activity would include moving dredging equipment down the creek channel while removing sediment and aquatic plants with associated local and temporary increases in turbidity and suspended sediments within the creek channel. Relocation of fish in combination with disturbance during dredging would be expected to result in temporary effects on the local resident fish populations inhabiting the creek. No threatened or endangered fish are expected to be present in the creek and therefore no adverse effects on these species are expected to occur. Ardenwood Creek is not designated as critical habitat for any fish species. After completion of the dredging and construction the cofferdams would be removed from the creek channel and resident fish would be able to disperse throughout the area.

The proposed Project has been designed, and would be constructed, using BMPs specifically intended to avoid and minimize adverse exposure to contaminants. As part of the specified Project Controls, the construction contractor would be required to provide spill containment and emergency response plans during dredging and construction. Spill prevention and cleanup provisions have been integrated into the proposed Project design during construction (e.g., restrictions on refueling near open waters or in-water refueling with appropriate spill prevention, isolation, and response plans). Daily, contractor's construction equipment and fuel and materials stored would be inspected to verify safety precautions are in place for possible fuel leakage and to verify if any hazardous materials are on-site which could poison or kill any species. All vehicles and the staging areas at the construction site would be checked daily and inspected to confirm no vehicle fuel or oil leakages have occurred.

In addition, installation of upstream and downstream cofferdams would help isolate the construction area and serve, with the existing tidal gates, to minimize the risks of indirect impacts resulting from the discharge of contaminated water into lower Alameda Creek. Since no special-status fish species or critical habitat would be directly affected by dredging and construction within Ardenwood Creek, and BMPs would avoid and minimize adverse effects on local resident fish species, the impacts of the proposed Project on special-status fish and fishery resources are considered to be less than significant.

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

Less than significant impact. Sensitive natural communities are natural community types considered by the CDFW to have a high inventory priority because of their rarity and vulnerability to disturbance and loss. Although sensitive natural communities have no legal protective status under the Federal Endangered Species Act (FESA) or California Endangered Species Act (CESA), they are provided some level of consideration under CEQA.

Natural communities are ranked based on rarity and threat with the Vegetation Classification and Mapping Program (VegCAMP) tool of the Biogeographic Data Branch of the CDFW.

Based on the California Sensitive Natural Communities ranking17 no sensitive natural community types occur on most of the site, with the exception of the well-developed expanse of coastal salt marsh north of the Dust Trail alignment. For the Phase 2 portion of the site, cattail marsh dominates the vegetative cover along Ardenwood Creek upstream of Patterson Ranch Road. Cattail marsh is not a sensitive natural community type. It has a rank of G5S518 in the rarity list of sensitive natural community types maintained by the CNDDB. Well-developed stands of coastal salt marsh dominated by pickleweed generally have a rank of G4S3 and are therefore considered a sensitive natural community type. However, areas of existing pickleweed cover upstream of Patterson Ranch Road do not form dense mats characteristic of natural salt marsh conditions, possibly due to a combination of decreasing salinity and past farming practices. The pickleweed component of the vegetative cover along the fringe of the Ardenwood Creek corridor varies, decreases as one moves upstream, but averages less than 50 percent absolute cover and is not considered a sensitive natural community type.

At the proposed bridge crossings for the Phase 3 portion of the site, vegetation along the edge of the Patterson Ranch Road and Chochenyo Trail crossings are dominated by ruderal species with scattered clumps of cattail, which does not qualify as a sensitive natural community type. At the DUST Trail location, the south side of the existing levee is dominated by non-native species and a single willow tree, just east of the existing culverts. On the north side of the Dust Trail location, the levee slope is dominated by ruderal cover, but at the base of the slope the wetlands continue across a large, continuous stand of pickleweed-dominated coastal salt marsh referred to as North Marsh. The stands of pickleweed marsh through this area are relatively high quality and represent a sensitive natural community type with a relatively high likelihood of supporting SMHM. Construction would be carefully controlled to minimize disturbance to areas of coastal salt marsh habitat as existing fills and the existing culvert are removed. Some disturbance to the fringe of the pickleweed-

[17] California Department of Fish and Wildlife, Biogeographic Data Branch, 2022, California Sensitive Natural Communities, July 5.

[18] Ranking is done at both the Global (full natural range within and outside of California) and State (within California) levels resulting in a single G (global) and S (state) rank ranging from 1 (very rare and threatened) to 5 (demonstrably secure). Natural Communities with ranks of S1-S3 are considered Sensitive Natural Communities to be addressed in the environmental review processes of CEQA and its equivalents.

dominated marsh would occur as a result of construction equipment and worker access. But the limits of construction would be constrained by installation of Exclusion Fence required to prevent access by SMHM and limit access into salt marsh habitat. Removal of fills through this area and replacement of the existing culverts with a bridge crossing would increase the extent of regulated waters and likely the extend of coastal salt marsh vegetation where restored elevations are appropriate for establishment of pickleweed. Given the controls required to ensure avoidance of SMHM and minimize disturbance to suitable habitat, potential impacts on the pickleweed-dominated coastal salt marsh habitat north of the DUST Trail would be less than significant and no additional mitigation is considered necessary.

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?

Less than significant impact. The site contains wetlands and non-wetland waters other potentially subject to regulatory agency jurisdiction, and authorizations would be required prior to any modifications. This includes jurisdiction of the Corps under Section 404 of the Clean Water Act, jurisdiction of the RWQCB under the Porter Cologne Act and Section 401 of the Clean Water Act, and jurisdiction of the CDFW under Section 1600 of the State Fish and Game Code.

Figure 10 shows the extent of potential jurisdictional waters on the site, estimated at a total of 9.08 acres. For Phase 2, an estimated 4.66 acres of jurisdictional waters would be fall within the limits of proposed construction activities, including the estimated 1.85 acre of potential unvegetated other waters that would be directly affected by proposed dredging activities. An estimated 2.81 acres of existing wetlands would be located within areas disturbed by temporary construction equipment access and other project-related activities. All the wetlands within the proposed Exclusion Fence along the Phase 2 reach would be affected by vegetation clearing required to ensure avoidance of SMHM and other wildlife. These impacts would be temporary, with the other waters remaining accessible to aquatic life once the temporary coffer dams have been removed and wetland vegetation resprouting or regenerating with the onset of fall rains following completion of construction.

Most of the disturbance under the Phase 3 work would involve removal of existing fills shown as non-regulated uplands at the proposed bridge crossings at Patterson Ranch Road and along the Chochenyo and DUST trails. Some limited disturbance to areas of unvegetated other waters and wetlands adjacent to fills to be removed would be affected by the culvert and fill removal as the natural channel is restored. This temporary disturbance would affect an estimated 0.89 acre of jurisdictional waters at the bridge crossings, consisting of primarily unvegetated other waters. An estimated 0.13 acre of regulated waters would be created where the culverts and existing fills would be removed as part of the bridge installation. The new bridge footings would be installed in upland areas along the trail alignments, although adjacent regulated waters could be affected during construction to allow construction equipment access. The limits of grading would be clearly defined through installation of temporary coffer dams and Exclusion Fencing.

Best Management Practices would be used to minimize indirect impacts on water quality and aquatic habitat. This includes installation of temporary coffer dams at either end of the channel reach to be dredged under Phase 2 and each of the culvert crossings, restrictions on timing of construction during the dry season, treatment of dewatering before discharge back into Ardenwood Creek, and other controls defined as part of the required SWPPP. Wetland areas disturbed during construction would be restored through seeding and plug plantings, although the dominant stands of cattail and other perennial species would resprout without much intervention. Under the current conceptual bridge plans, all new concrete poured for the abutments and any piers or drilled piles would be placed outside and above the OHWM. Water quality in the channel open water areas would be protected through isolation of the crossing using coffer dams, and use of fiber rolls and silt fencing during construction activities. All bridge construction equipment would operate from high ground above jurisdictional waters and there would be no need to use equipment in the channels for the culvert removal or bridge placement work.

Authorizations would be secured from regulatory agencies in advance of construction, which would address temporary impacts on regulated waters and ensure adequate controls are implemented to minimize any adverse effects on downstream waters and aquatic habitat. All conditions and control measures specified in agency authorizations would be followed, including monitoring to ensure revegetation is successfully accomplished. The project is assumed to be self-mitigating and disturbed conditions created by the project would be successfully disturbed. Ardenwood Creek is a trapezoidal channel upstream of Patterson Ranch Road and there is no reason to assume existing vegetative cover would not re-establish given the species present and revegetation efforts proposed as part of the project. Potential impacts on regulated waters are considered less than significant and no additional mitigation is considered necessary.

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?

Less than significant impact. No significant migratory corridors or nursery sites would be affected by Project activities. A wildlife exclusion fence would be installed around the limits of proposed construction to prevent inadvertent take of small mammals and other wildlife, but this disruption would be temporary and would restore flood capacity and increase available aquatic habitat along Ardenwood Creek. Construction activities would occur outside the bird nesting season (February 1 to August 31), thereby avoiding the potential for disturbance to active nesting. While construction would temporarily disrupt wildlife activity in the site vicinity, the surrounding undeveloped parklands would continue to be available for foraging and dispersal, potential impacts would be less than significant, and no mitigation is considered necessary.

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

Less than significant impact. The proposed project would not conflict with any local ordinances or the intent of the relevant goals and policies of the City of Fremont General Plan.19 The Conservation Chapter (Chapter 7) of the General Plan provides a framework to help guide decision making in the conservation, management, and utilization of natural resources in the city. Implementation of the various Project Controls would ensure protection and avoidance of sensitive resources in the site vicinity, including special-status species which may be present, nesting birds, and regulated waters. No significant conflicts are anticipated with implementation of these Project Controls and Mitigation Measures, and no additional mitigation is considered necessary.

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?*

No impact. The proposed project would not conflict with any approved habitat conservation plans as none encompass the site or surrounding area. No impacts are anticipated, and no mitigation is considered necessary.

Mitigation Measures

Project Controls incorporated into the proposed Project would serve to address potentially significant impacts on biological resources. No additional mitigation measures are proposed.

5. Cultural Resources

		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 formal cemeteries?	☐	☒	☐	☐

Introduction

The project is within the diked, historic baylands that border San Francisco Bay. Habitats include freshwater marsh, cattail marsh, pickleweed marsh, and annual grasslands. The curved reach of Ardenwood Creek consists of a creek channel. Marshlands form a mosaic of freshwater habitats downstream near the Chochenyo trail crossing, and the D.U.S.T. trail crossings. Further downstream, the J-Ponds act as temporary storm-water storage prior to discharging flows through a tide gate into Alameda Creek.

[19] City of Fremont. 2011. *City of Fremont General Plan*. Adopted December.

Historic salt evaporation ponds and agriculture have changed the past environment and a system of levees built by the Patterson Family prior to 1917 reclaimed the old slough as well as the tidal marshlands (Pressler 1973). Allardt's 1874 Official Map of Alameda County, California shows a "Sausal or Willow Swamp" within the site.

The Creek & Watershed Map of Fremont & Vicinity (Sowers 1999) indicates that Ardenwood Creek through the site has been subjected to extensive channelization. The northern part of Phase 1 Drainage Improvement crosses a former ca. 1850 willow grove along the original alignment of Ardenwood Creek. Phase 2 culvert at Patterson Pass Road was just beyond the extensive willow grove(s). Both culverts north of Patterson Ranch Road were within the willow grove.

An *Archaeological Resources Review- Results of Archival Literature and Records Search and Field Inventory in Support of USACE Section 404 Permit Ardenwood Creek (Zone 5 Line P), Job F05c23 – 0.4 Mile Flood Control Channel and 3 Culvert Locations Fremont, Alameda County* was completed March 9, 2020, by Basin Associates (**Appendix C**).

No evidence of prehistoric and/or combined prehistoric/historic features, isolates or sites or cultural sediments was observed in or adjacent to the project area. Four other reports on file also indicated no cultural resources within the project area. Two prehistoric sites have been recorded within 0.25 mile of the project area.

Comments to Questions

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

No impact. No evidence of historic features was observed in or adjacent to the project area.

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

Less than significant impact with mitigation incorporated. No evidence of prehistoric and/or prehistoric features, isolates or sites or cultural sediments was observed in or adjacent to the project area. However, there is the potential for archeological resources to be encountered during subsurface excavation. Implementation of the mitigation measures in this section would minimize this potential impact to less than significant.

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

Less than significant impact with mitigation incorporated. No evidence of prehistoric and/or prehistoric features, isolates or sites or cultural sediments was observed in or adjacent to the project area. However, there is the potential for human remains to be encountered during subsurface excavation. Implementation of the mitigation measures in this section would minimize this potential impact to less than significant.

Mitigation Measures

CUL-1 In order to mitigate potential adverse impacts to Native American cultural objects discovered during construction, work shall be halted within 100 feet of a discovery until the objects have been inspected and evaluated by a qualified Archaeologist meeting the Standards of the Secretary of the Interior. The Archaeologist shall identify and evaluate the significance of the discovery and develop recommendations for treatment to ensure any impacts to the cultural resource are less than significant. The preferred mitigation is avoidance. If avoidance is not feasible, Project impacts shall be mitigated in accordance with the recommendations of the evaluating Archaeologist in consultation with the Lead Agency, and CEQA Guidelines §15126.4 (b)(3)(C). Such mitigation may include additional archaeological testing, archaeological monitoring and/or an archaeological data recovery program in consultation with tribal representatives. A Native American monitor shall be retained to monitor the ground disturbance when it is suspected that prehistoric human remains might be encountered.

CUL-2 In order to mitigate potential adverse impacts to human remains discovered during construction, in the event of post-review discoveries of cultural resources, the exposure and treatment of Native American burials and any associated or unassociated funerary objects discovered during any soil-disturbing activity within the project site shall comply with applicable State laws. This shall include immediate notification of the Alameda County Coroner/Medical Examiner and the Alameda County Flood Control and Water Conservation District. In the event of the coroner's determination that the human remains are Native American, notification of the Native American Heritage Commission, is required who shall appoint a Most Likely Descendant (MLD) (Public Resources Code Section 5097.98) who shall make recommendations for treatment. Work shall be halted within 100 feet of the discovery until the materials or features have been inspected and evaluated by a qualified Archaeologist who meets the Standards of the Secretary of the Interior. The most likely descendant shall have 48 hours after being allowed access to the site to make recommendations for disposition of the remains and associated grave goods.

6. Energy

		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?	☐	☐	☐	☒

Comments to Questions

Construction of the proposed project would require energy use by construction equipment. Project construction would employ modern equipment that complies with all applicable energy standards and could be served by existing local and regional energy supplies, without substantially affecting peak and base period demands for electricity.

a) Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation?

Less than significant impact. Construction energy use compliant with applicable energy standards would not be wasteful or inefficient. Project construction or operation would not require new or expanded electric power, natural gas, or telecommunications facilities. For these reasons, the impact of the proposed project on energy would be less than significant.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

No impact. No features of the proposed Project would conflict with or obstruct state or local plans for renewable energy or energy efficiency. The project would not require the relocation or construction of new or expanded electric power or natural gas facilities.

Mitigation Measures

No mitigation measures are proposed.

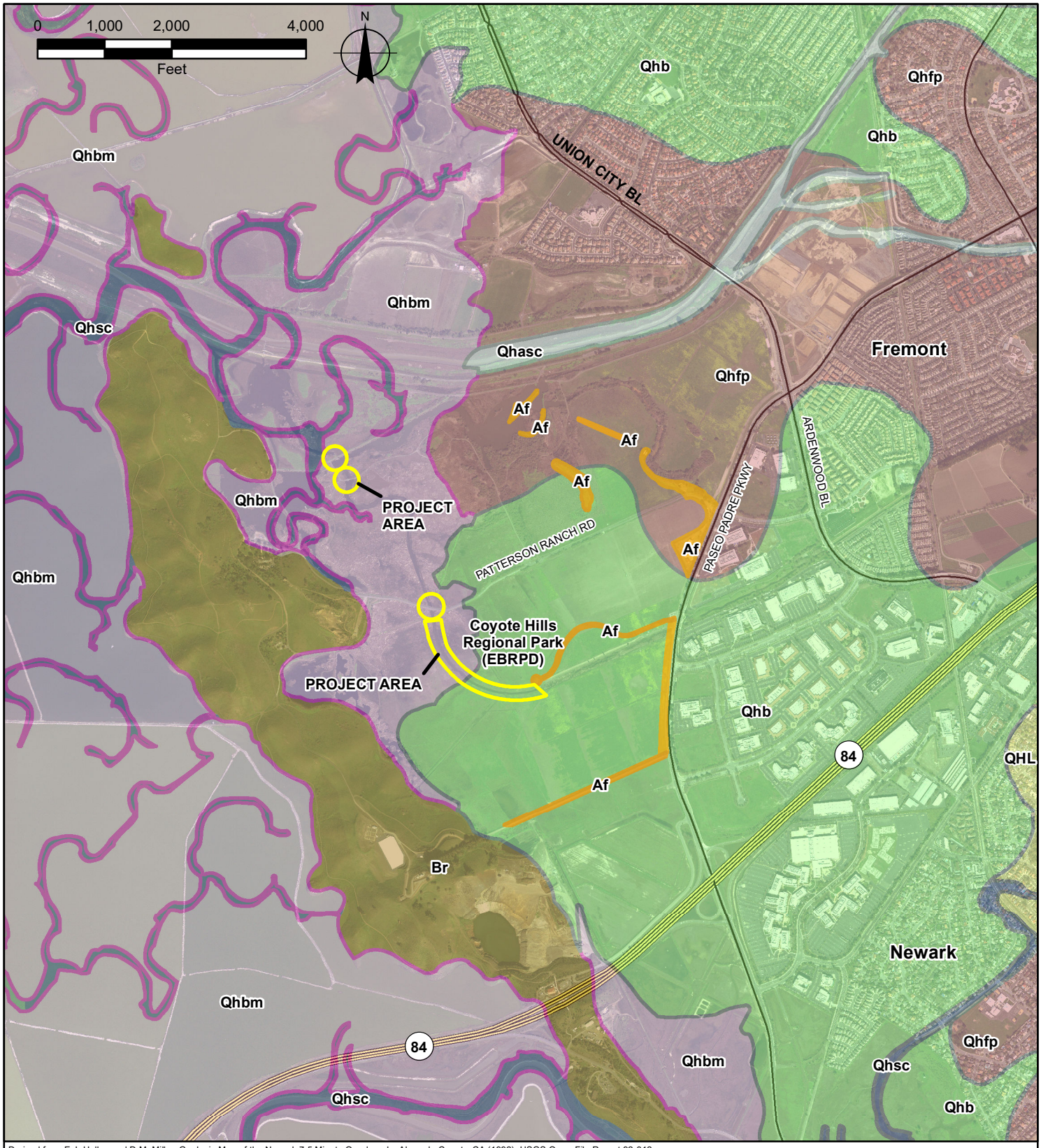
7. Geology and Soils

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

Introduction

The project area is underlain by flat lying, recent alluvial sediments, including fine grained flood basin and estuarine deposits (Bay Muds) south of Patterson Ranch Road, and along the Line P channel to its outlet at Alameda Creek, and recent stream alluvium to the north east and east (**Figure 11**). Underlying the Bay Muds at depths typically greater than twenty feet are a sequence of ancestral stream deposited sands and gravels, reflecting periods of differing levels of the Bay with respect to the adjacent watershed lands, and the climate history of this area associated with differing glacial and pre-and post- glacial periods. This area was historically a tidal marsh that has now been diked off from direct tidal action. There are no known or recognized active earthquake faults that pass through the project area. The active Hayward Fault is located 4 miles to the east and the San Andreas Fault system is located 13 miles to the west.

Project area soils may be susceptible to liquefaction associated with strong ground motion from activity on regional faults. The bridges would require seismic consideration in design, including geotechnical investigations for each bridge. Other geotechnical issues requiring consideration in planning and design include poor drainage and high-groundwater conditions, clayey and expansive soils, and corrosive soil conditions that could affect concrete and metal associated with bridge abutments and underground utilities.



Derived from E.J. Helley and D.M. Miller, Geologic Map of the Newark 7.5 Minute Quadrangle, Alameda County, CA (1992). USGS Open-File Report 92-312.

Project Area	Qhbm Estuary Deposits (Bay Mud)	Qhsc Natural Stream Channels (1896)
Br Bedrock	Qhfp Floodplain Deposits	Qhasc Artificial Stream Channels
Qhb Floodbasin Deposits	Qhl Levee Deposits	Af Artificial Fill

Alameda County Flood Control & Water Conservation District

QUESTA ENGINEERING CORP.

Figure 11

GEOLOGY

ARDENWOOD CREEK

Comment to Questions

a. 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?

No impact. The project site is located in a seismically active area, the San Francisco Bay Area, which is located in the vicinity of the San Andreas Fault System at the margin between the Pacific Tectonic Plate and the North American Tectonic Plate. The San Andreas Fault System includes major active earthquake faults including the Hayward fault located northeast of the project site, the Calaveras fault 12 miles east, and the San Andreas fault to the southwest. No active earthquake faults are known to cross the subject property, so that surface fault rupture is considered to have no impact to site use or improvements.

a. ii) Strong seismic ground shaking?

Less than significant with mitigation incorporated. Earthquakes that occur along or near one of the several active earthquake faults in the region could impact the site and any improvements (such as vehicular and pedestrian bridges) because of strong seismic groundshaking. Based on near-by detailed geotechnical investigations, peak ground accelerations at the project site are estimated to be about 54% that of gravity (g) with a 10 percent chance of exceedance in a 50-year period. Ground accelerations of this magnitude could result in significant damage to unreinforced structures or buildings, including levees and bridge foundations. Current Building Codes, including the 2020 California Building Code which has been adopted by the City of Fremont and County of Alameda, require new structures to be designed to resist the effects of strong seismic ground shaking. New bridge structures at the site would be designed in accordance with current California Building Codes. Strong ground shaking is considered to be less than significant with incorporation of the mitigation measures contained in this section. Implementation of Mitigation Measure GEO-1 would reduce the impact of strong seismic ground shaking to a level of less than significant.

a. iii) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Less than significant with mitigation incorporated. Another effect of seismic activity is the potential for seismic related ground failure, including liquefaction and dynamic densification. During and following strong seismic groundshaking, low density silty sand and poorly graded sand deposits, such as occur beneath the site surface soil layers, can undergo settlement. Liquefaction occurs when water saturated sand deposits lose strength due to a loss of pore pressure. Liquefaction settlement generally occurs gradually over the following days and weeks. Dynamic densification occurs when dry sand and silty sand deposits settle during strong seismic groundshaking.

According to maps prepared by the USGS, soils in the project area have a high to extremely high susceptibility to liquefaction due to seismic shaking. The Seismic Hazard Zones Map of the Newark

Quadrangle (California Geological Survey, July 2, 2003) shows the site as being in an area where historical occurrence of liquefaction or local geological, geotechnical, and ground water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required. Project specific mitigation measures would be developed in accordance with requirements of the Public Resources Code.

Mitigation Measure GEO-2 would reduce the impact of seismic-related ground failure, including liquefaction, to a level of less than significant.

a. iv) Landslides?

No impact. The project area is located on nearly level (slope less than 1 percent) alluvial soils, with a relief of only about ten feet throughout the area. However, the existing Line P channel banks are steep (1.5-2:1) and some areas may be subject to slumping and scour during high stream flow events. The bank slopes along the excavated and deepened channel would be laid back to a more stable angle of 3:1. Natural slope instability does not occur at such low gradients, except along the Line P channel banks if the cuts are overly steep and unstable. The Project channel bank slopes have been designed to ensure channel stability. Landslides have no impact to site use or improvements.

b) Result in substantial soil erosion or the loss of topsoil?

Less than significant with mitigation incorporated. Proposed improvements to the site include channel excavation, culvert removal and bridge and road reconstruction and restoration of disturbed areas with native plant species. Areas to be graded and altered during construction activities, including channel excavation and desilting, could be subjected to soil erosion by wind and water. Site soils have a low erosion hazard due to their cohesiveness and gentle slopes, however, disturbed channel banks have some potential for slumping. The proposed truck excavated sediment haul roads adjacent to the channel work areas would disturb ground that has been cleared of vegetation and these areas are also subject to erosion. All projects (including the proposed Line P channel bank slope work) that would disturb or alter more than one acre in area are subject to the requirement to reduce the potential impact of soil erosion by developing and implementing a Storm Water Pollution Prevention Plan (SWPPP) and Erosion Control Plan developed in accordance with permitting requirements with the State Water Resources Control Board. The SWPPP shall include Best Management Practices (BMPs) for control of soil erosion and sedimentation and shall be prepared by a Qualified SWPPP Developer (QSD). With the implementation of Mitigation Measure GEO-3, soil erosion or the loss of topsoil would be reduced to a level of less than significant.

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?

Less than significant with mitigation incorporated. As discussed above, the soils underlying the site are subject to the effects of liquefaction and could settle following strong seismic ground shaking. Lateral spreading could occur in the site's liquefiable soils located adjacent to the stream channel and slough banks. Project specific design would be implemented in accordance with requirements of the Public Resources Code. The impact of being located on a soil unit that is unstable or could

become unstable and result in lateral spreading and liquefaction is considered less-than-significant impact with implementation of Mitigation Measures GEO-2 and GEO-4.

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?

Less than significant with mitigation incorporated. Expansive soils are present at the project site area. Seasonal expansion and contraction of site soils could damage site improvements such as bridge foundations and approach ramps, concrete slabs and pavement areas. Since most of the soils in the project area remain saturated through much of the year, shrink/swell behavior dur to alternate wetting and drying periods is primarily limited to the levee areas and haul ramps to the adjacent roads, such as Patterson Ranch Road. Expansive soils can be mitigated by including design measures such as removal and replacement with non-expansive soils, segregating expansive soils from overlying improvements, lime-treating expansive soils to reduce the expansiveness, and increasing the thickness of non-expansive construction materials such as Class 2 Aggregate Base between the expansive soil and overlying concrete and hot mix asphalt improvements. The impact of expansive soils is considered less than significant with Mitigation Measures **GEO-1** through **GEO-4.**

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

No impact. There are no planned on-site wastewater disposal systems at the project site.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

No impact. There are no known unique geologic or paleontological features at the project site, and there is a low probability of occurrence.

Mitigation Measures

GEO-1 Strong Seismic Ground Shaking. Any construction built as a result of the implementation of the project shall meet requirements of the current California Building Code Vol. 1 and 2, including the California Building Standards, current edition, published by the International Conference of Building Officials, and as modified by the amendments, additions and deletions as adopted by the City of Fremont, California.

GEO-2 Seismic-related Ground Failure, including Liquefaction. Design-level Geotechnical recommendations shall be prepared for the Project under the direction of a California Registered Geotechnical Engineer, or Registered Civil Engineer experienced in geotechnical engineering. The Geotechnical recommendations shall be based on the information developed for the site and shall establish the seismic design parameters, as determined by the geotechnical engineer or civil engineer in accordance with requirements of the California Building Code, for improvements to the project site. The Geotechnical recommendations and design plans shall identify specific mitigation

measures to reduce the liquefaction potential of surface soils in areas where liquefaction would pose a risk to health and safety in accordance with Public Resources Code Section 2693 (c).

GEO-3 Soil Erosion and Loss of Topsoil. In accordance with the Clean Water Act and the State Water Resources Control Board (SWRCB), the applicant for any construction projects that disturb more than one acre shall file a Storm Water Pollution Prevention Plan (SWPPP) prior to the start of construction. The SWPPP shall include specific best management practices to reduce soil erosion. This is required to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit).

An Erosion Control Plan (ECP) shall be prepared for implementation by the construction contractor associated with the Grading Plan and SWPPP. The ECP shall include winterization, dust, erosion and pollution control measures conforming to the California Stormwater Quality Association (CASQA) Best Management Practices handbooks, with and sediment or settling basin design calculations. The Erosion Control Plan shall describe the "best management practices" (BMPs) to be used during and after construction to control pollution resulting from both storm water and construction water runoff. The Plan shall include locations of vehicle and equipment staging, portable restrooms, mobilization areas, and planned access routes.

Recommended soil stabilization techniques include placement of straw wattles, silt fences, berms, and gravel construction entrance areas or other control to prevent tracking sediment off-site onto city streets and into storm drains, as well as hydroseeding or planting of all disturbed areas. The Plan shall also include a revegetation component including seeding and planting.

GEO -4 Unstable Geologic Units and Expansive Soils. Proper foundation engineering and construction of any structures built as a result of implementation of the project shall be performed in accordance with the recommendations of a Registered Geotechnical Engineer or Civil Engineer experienced in geotechnical design and a Registered Structural Engineer or Civil Engineer experienced in structural design. Geotechnical recommendations shall address zones of potentially liquefiable or expansive soil as they relate to proposed improvements and provide foundation, road pavement section, concrete slab-on-grade, utility construction and other recommendations to mitigate any zones encountered.

The structural engineering design shall incorporate seismic parameters as outlined in the current California Building Code. The Geotechnical recommendations shall establish the seismic design parameters, as determined by the geotechnical engineer in accordance with requirements of the current California Building Code.

8. Greenhouse Gas Emissions

	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?	☐	☐	☐	☒

Introduction

The most important and widely occurring anthropogenic greenhouse gas (GHG) is carbon dioxide (CO_2), primarily from the use of fossil fuels like coal, petroleum or natural gas. Also, important GHGs are methane (CH_4), a principal component of natural gas, and nitrous oxide (N_2O). Fertilizer use and agriculture contribute substantial CH_4 and N_2O emissions, which are more potent than CO_2 as anthropogenic drivers of climate change. Other anthropogenic activities such as deforestation and other changes in land use contribute to rising atmospheric GHG levels.

There is international scientific consensus that human-caused increases in GHGs have and would continue to contribute to global warming. Potential global warming impacts in California may include, but are not limited to, loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, increased forest fires, and more drought years. Secondary effects are likely to include a global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity.

Executive Order S-3-05 was established by Governor Arnold Schwarzenegger in June 2006 established the following statewide emission reduction targets through the year 2050:

By 2010, reduce GHG emissions to 2000 levels.

By 2020, reduce GHG emissions to 1990 levels.

By 2050, reduce GHG emissions to 80% below 1990 levels.

AB 32, also known as the California Global Warming Solutions Act of 2006 designates the California Air Resources Board (CARB) as the State agency charged with monitoring and regulating sources of emissions of GHGs. Under AB 32, the State board is required to approve a statewide GHG emissions limit equivalent to the statewide GHG emissions level in 1990 to be achieved by 2020 and to adopt rules and regulations in an open public process to achieve the maximum, technologically feasible, and cost-effective GHG emissions reductions. The law establishes periodic targets for reductions and requires certain facilities to report emissions of GHGs annually.

The BAAQMD *CEQA Air Quality Guidelines* provide CEQA thresholds of significance for operational GHG emissions from land use projects: 1) 1,100 metric tons of CO2e per year; or 2) 4.6 metric tons

of CO2e per year per project "service population" (i.e., project residents + project employees), which are also considered the definition of a cumulatively considerable contribution to the global GHG burden and, therefore, of a significant cumulative impact. The BAAQMD has not defined thresholds for project construction GHG emissions. The *Guidelines* methodology and thresholds of significance have been used in this Initial Study's analysis of potential GHG construction and operational impacts associated with the Project.

Comments to Questions

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

Less than significant. Although the Project channel grading construction phase would produce 54.7 metric tons of CO2e in the year 2022, and the bridge construction phases would produce 81.1 metric tons of CO2e in the year 2024, no new operational GHG emissions are anticipated as part of this project. If construction emissions were judged under the same significant standard as operational emissions, they would be below the CEQA GHG significance threshold. Thus, GHG emissions associated with the Project would be ***less than significant***.

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

Less than significant. By meeting the CEQA significance thresholds, the Project would not conflict with applicable plans, policies, and regulations adopted for the purpose of reducing GHG emissions in California and the Bay Area and, thus, would have a ***less than significant*** impact.

Mitigation Measures:

No mitigation measures are proposed.

9. Hazards and Hazardous Materials

	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 Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 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?	☐	☐	☒	☐

Comments to Questions

a, b) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?
Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less than significant. The proposed project is a flood management and channel restoration project that would not involve the transport, use or disposal of substantial quantities of hazardous materials. Soil transport would be located on Patterson Ranch Road and Paseo Padre Parkway. No hazardous materials would be stored in the project area in support of the project, other than typical consumer-related products, such as cleaning solvents. Most of these materials would be consumed during use. The limited amounts of hazardous materials would be labeled to inform users of potential risks and to instruct them in appropriate handling, storage, and disposal procedures. None of the proposed uses are associated with the routine transport of substantial quantities of

hazardous materials that could spill and create a significant hazard to the public or the environment. This impact would be less than significant.

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

No impact. The project area is not within 0.25 mile of an existing or proposed school site. The closest school to the project area is the Delaine Eastin Elementary School, located at 34901 Eastin Drive, approximately one mile northeast of the project area.

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

No impact. The project area is not located on or near a site listed in federal or state databases of major hazardous release sites (e.g., Superfund sites), pursuant to Government Code Section 65962.5.[20] There would be no impact.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

No impact. The project area is not located in an airport land use plan or in the vicinity of a public or private airport and therefore would not create impacts associated with airplane traffic. There would be no impact.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less than significant impact. Patterson Ranch Road is the primary access point to Coyote Hills Regional Park. Removal of the existing culvert and replacement with a clearspan bridge may affect traffic along this road. The bridge work would be designed and implemented to maintain at least one lane of traffic on Patterson Ranch Road, or closure of the road at Paseo Padre Parkway during construction, in consultation with EBRPD.

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

[20] California Department of Toxic Substances Control, EnviroStor database, available online at: http://www.envirostor.dtsc.ca.gov/public/search.asp?cmd=search&reporttype=CORTESE&site_type=CSITES,OPEN,FUDS,CLOSE&status=ACT,BKLG,COM&reporttitle=HAZARDOUS+WASTE+AND+SUBSTANCES+SITE+LIST, accessed 27 April 2018.

Less than significant impact. Approximately half of the Project Area is not accessible to the public, and no structures are proposed other than replacement bridges and drainage structures that would improve accessibility for park users.

The project site is not classified as a very high fire hazard severity zone in state or local responsibility areas, as defined by the California Department of Forestry and Fire Protection (CAL FIRE).21

The creek and channels are managed by ACFCWCD, and the surrounding area is managed by EBRPD, which maintains a program of fire prevention and suppression, and would continue to coordinate these efforts, including grassland vegetation management activities like goat and sheep grazing and prescribed burns, to help control the build-up of flammable vegetation at the project site. EBRPD monitors weather and fire conditions to aid in preventing wildfires, and could temporarily close Coyote Hills Regional Park, including the Project Area, in especially dry and windy conditions.

The proposed Project would not result in substantial impacts to emergency access. At least one traffic lane would be maintained along Patterson Ranch Road during bridge work, or the Road would be closed at Paseo Padre Parkway in consultation with EBRPD. It would not create new barriers to emergency vehicles. The Project would keep existing site access with new bridges and drainage crossing structures that can be utilized by emergency vehicles, but these facilities would not exacerbate fire risk. Emergency access on existing streets within and adjacent to the site would not be affected. The project site does not have substantial slopes, prevailing winds, or other factors that would exacerbate wildfire risks and thereby expose visitors to substantial pollutant concentrations from wildfire. Because there are no substantial slopes on the project site, there would not be a significant risk due to post-fire slope instability or drainage changes. Therefore, wildfire intensity and risk is considered a less than significant impact.

Mitigation Measures

HAZ-1 The District would coordinate with EBRPD to maintain emergency access to the Park Visitor's Center and other facilities as needed during project construction.

21 California Department of Forestry and Fire Protection, *California Fire Hazard Severity Zone Map Update Project,* available online at: http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_zones_maps, accessed 30 April 2018.

10. Hydrology and Water Quality

	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 groundwater quality?	☐	☒	☐	☐
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☒	☐	☐
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	☐	☐	☐	☐
i. Result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐
ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☒	☐
iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☒	☐	☐
iv. Impede or redirect flood flows?	☐	☒	☐	☐
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☒

Introduction

Surface and Groundwater Hydrology. The area was historically tidally influenced and connected to tidal action to the south San Francisco Bay on both the north and south side of the near-by Coyote Hills by a series of tidal channels. Hydrologic conditions in the project area have been significantly altered by historic diking, for salt production to the south by agricultural drainage ditches and historical irrigation well pumping, urbanization, and flood control channel construction. However, groundwater remains very high throughout the Project area (typically within 1 to 3 feet of the surface) and shallow saline/alkaline groundwater inflow occurs into the existing Ardenwood Creek channel. Because of this condition, dewatering to control groundwater levels and create a near dry construction work environment would not be possible, and the sediment excavation work in the channel would need to occur within the wet channel environment.

Surface Water. In terms of surface water hydrology, the greater project area is within a closed drainage basin bounded on the east by the higher ground of Paseo Padre Boulevard, on the north by the Alameda Creek Flood Control Levees, on the south by the Burrowing Owl Levee, separating the project area from Cargill Inc. lands, and other levees and roads connecting Paseo Padre Parkway with the former Dumbarton Quarry area, and to the west by the Coyote Hills foothills.

Surface water inflow into and through this larger basin area is from storm water runoff and groundwater seepage into the Line P- Ardenwood Creek flood control channel, storm water runoff conveyed in the Line K/Crandall Creek flood control channel which joins flow from Line P/Ardenwood Creek, and by incident rainfall which is collected in several historic agricultural drainage ditches and discharged to Line P and Line K. Surface flow from Ardenwood Creek is through the J-pond complex (**Figure 12**). Flood flows are held or detained in a series of detention ponds in this area for eventual release via tide gates in the southern Alameda Creek levees when flow conditions in this system allow release of the stored water through the levees. Extended periods of shallow ponding occur following heavy storm events such as occurred during the winter of 2016, when much of the Ardenwood Creek project area was under shallow, stored flood waters.

The surface water in Ardenwood Creek is fresh in the eastern portion of the project area, near Paseo Padre Parkway and becomes increasingly brackish as it moves through former tidal marsh and alkali wetlands to the west. It is brackish where Patterson Ranch Road crosses Ardenwood Creek.

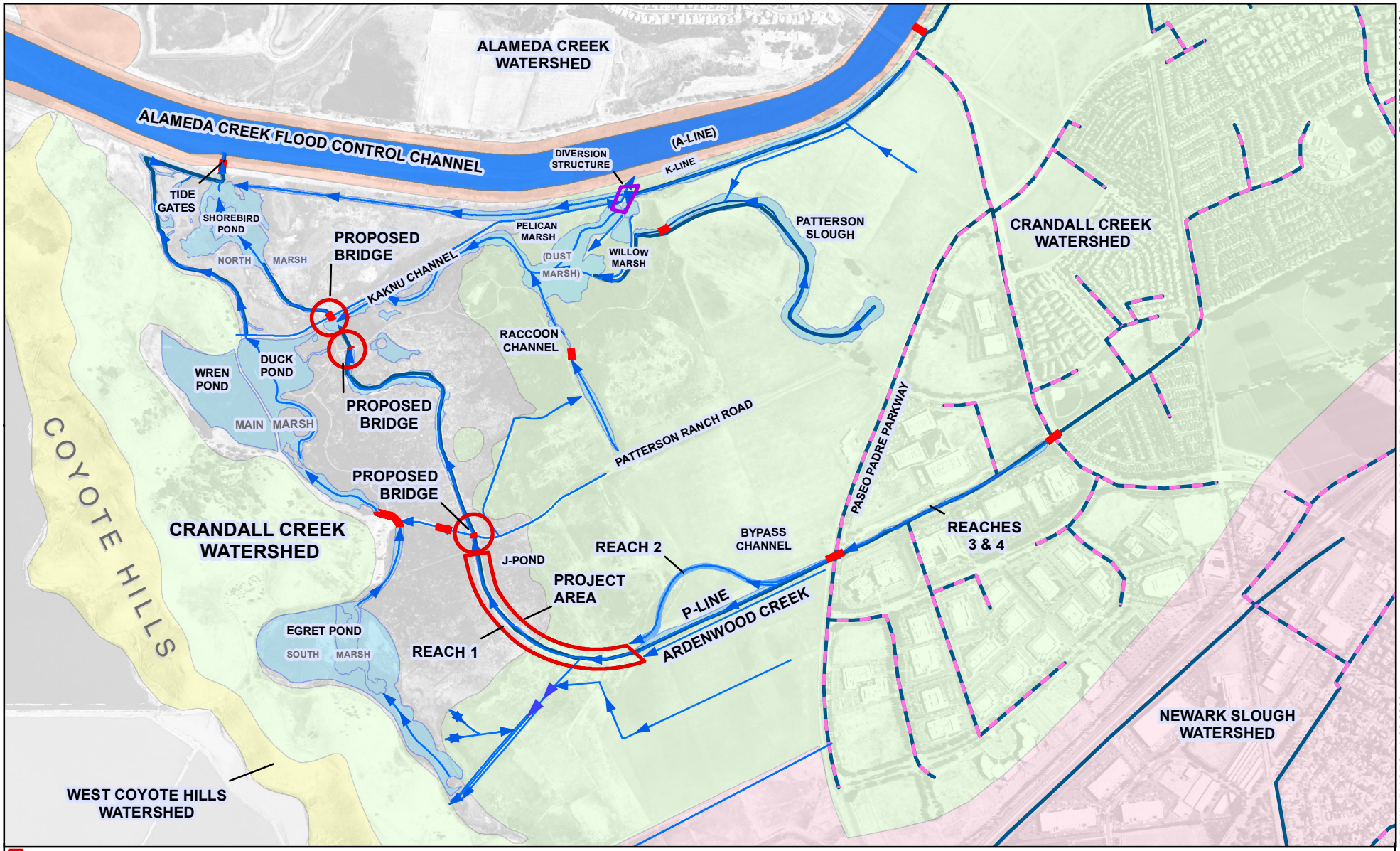
Groundwater. The groundwater in the Project area can be thought of as consisting of several distinctly different but interconnected ground water bodies of varying characteristics, thickness and salinity-alkalinity**.** The shallow or near surface zone is contained in historic tidal marsh sediments and is highly saline/alkaline throughout much of the year, becoming less saline during periods of watershed inflow and extended ponding. This is the water intercepted by Ardenwood Creek, which must be managed during channel excavation work.

In addition to the shallow groundwater zone, which affects wildlife pond management and agriculture, there are several recognized deeper aquifers, including an upper or Newark aquifer, a middle zone consisting of the Centerville and Fremont aquifers, and an unnamed deep aquifer. Water in the upper aquifer has been affected by Bay Sea water intrusion and is slightly saline and non-potable. It may be suitable for restoration plant establishment irrigation, but not for most agricultural crops. The middle and deep aquifers have the best quality of water and are used for municipal and agricultural purposes. Alameda County Water District closely manages the Niles Cone groundwater basin, including destroying or closing poor quality or abandoned wells, especially those located close to the Bay, monitoring and regulating new wells, including bore holes for geotechnical investigation and for deep foundations such as drilled piers for bridges. ACWD also conducts an active groundwater recharge program to store water, reverse bay sea water intrusion, and protect and improve groundwater quality. Some of this up basin recharge water may influence shallow zone groundwater levels in the Project area.

Comment to Questions

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

Less than significant with mitigation incorporated. The overall Project area includes several local waterways; 1) Ardenwood Creek or Line P, the principal water feature in the Project area 2) Patterson Sough and Crandall Creek northeast of the site, 3) the shallow flood detention and wildlife habitat ponds in the J pond area and 4) the regional Flood Control channel- Alameda Creek, to the north. Patterson Slough, Ardenwood Creek and Crandall Creek all drain downstream through



PROJECT NO. 1900131

APPROVED BY JP 10-26-2020

DRAWN BY CEC 10-26-2020

Flood Control & Water Conservation DISTRICT

QUESTA ENGINEERING CORP

FIGURE 12

WATERSHED / HYDROLOGY

ZONE 5 LINE P ARDENWOOD CREEK

Coyote Hills Regional Park to Alameda Creek, and eventually join through a series of ponds and ditches and discharge to South San Francisco Bay via a series of tide gates in lower Alameda Creek.

Channel excavation and sediment removal associated with the proposed project could cause short-term, potentially significant impacts to water quality if sediment-laden return flow and haul road runoff, or if fuel or other construction chemicals are not adequately controlled and are accidentally or unintentionally released into the channel. This is a ***potentially significant impact.***

Implementation of Mitigation Measures HYDRO-1, HYDRO-2, and HYDRO-3 would reduce these potential impacts to a ***less-than-significant*** level.

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

Less than significant with mitigation incorporated. The Project Area lies within the Niles Cone Groundwater Basin, a major water source for the Alameda County Water District. Although the Project area has several monitoring wells, there are no active domestic or irrigation wells that withdraw groundwater. There are several deeper groundwater agricultural wells on the adjacent Coyote Hills Regional Park lands that can draw water from the upper or Newark aquifer and from deeper aquifers that have been historically used for filling wildlife ponds and for irrigation of farm fields within the Regional Park. There are also several abandoned wells near the Project area or adjacent to it.

Grading and construction activities that damage wells can impact groundwater by causing down well leakage of poorer quality near surface water to lower and better quality, deeper aquifers. This can also occur when shallow bore holes or even piers for structures such as bridge foundations, penetrate through restrictive layers without proper control measures, such as sealing and grouting pier casings and surface layers, allowing down hole water flow. This is a potential concern if any of the culvert-replacing pedestrian bridges use deep drilled piers for foundations. However, this concern can be addressed by grouting piers, which is an ACWD requirement enforced through their well and bore hole permitting process. This represents a ***potentially significant impact.*** Implementation of Mitigation Measures HYDRO-4 and HYDRO-5 would reduce potential groundwater related impacts to a ***less than significant*** level.

Ci-iii) 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:
Result in substantial erosion or siltation on- or off-site.
Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite.
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?

Less than significant with mitigation incorporated. Construction of the Line P/ Ardenwood Creek Flood Control Project would and disturb approximately 5 acres of land, including channel disturbance, temporary soil storage areas, and equipment staging areas. The proposed project does not include construction of impervious surface areas, other than the small areas associated with bridge decks. Existing site runoff does not currently drain into a urban storm-drain or storm-sewer system, it ponds within the adjacent marshlands during wet periods and drains out through Line P to Alameda Creek. All of the project access roads and trails would be out sloped and designed to disperse runoff locally, and not concentrate flow.

Grading and construction activities would disturb soils, including haul road clearing and channel excavation, and if not properly stabilized, this disturbance could result in increased turbidity in surrounding surface waters. Disturbed and exposed surfaces would be susceptible to the erosion forces of water and could result in the degradation of water quality in Ardenwood Creek, the downstream water bodies in Coyote Hills Regional Park, and Alameda Creek.

The proposed Project includes measures to minimize erosion and water quality degradation. However, if improperly designed, constructed, and maintained, implementation of the proposed Project would result in short-term and long-term increases in erosion and subsequent degradation of water quality. This is a ***potentially significant impact***.

Implementation of Mitigation Measure HYDRO-5 along with previous Mitigation Measure HYDRO 1 and HYDRO-2 would reduce potential runoff related impacts to a ***less than significant*** level.

iv) Impede or redirect flood flows?

Less than significant with mitigation incorporated. The proposed Project includes the installation of two (2) new clearspan bridges to replace existing culverts and a new vehicular bridge to replace a series of culverted structures beneath Patterson Ranch Road at the Line P channel crossing. All of these structures are located within a FEMA-designated 100-year floodplain area.

Final bridge plans would be designed so that the bottom chord of the bridges clear the 100-year flood elevation by a minimum of 1-foot, if required by applicable City of Fremont and Alameda County flood management regulations. All structures would be designed so that none of the bridges affect local floodwater elevations, block, or divert flood flows, or cause local scour or channel and levee instability problems. However, if the bridges are improperly designed or constructed, they could cause or contribute to local flooding problems. These represent ***potentially significant impacts***.

Implementation of Mitigation Measure HYDRO-5 would reduce potential flooding related impacts to a ***less than significant*** level.

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

No impact. The Project area is not in a tsunami inundation zone, an area susceptible to seiche or mudflows, therefore there is ***no impact***.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

The Project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. The area does not serve as an important freshwater aquifer recharge area for groundwater and there is no proposed withdrawal of groundwater as a part of the Project description, therefore there is ***no impact***.

There are several groundwater monitoring wells maintained jointly by the Alameda County Flood Control and Water Conservation District and the Alameda County Water District that are used to monitor groundwater levels and water salinity as part of Basin wide groundwater management activities. These monitoring wells provide information for managing groundwater recharge activities to mitigate against salt water intrusion into regionally important aquifers. Some of the monitoring wells may be located near where existing culverts would be replaced by bridges to facilitate drainage and flood control activities. If these wells are impacted by bridge construction activities, then the wells would be relocated near-by as a part of the final Construction Plans. This would be done in cooperation with Alameda County Water District (ACWD).

Mitigation Measures

HYDRO-1: Soil Erosion Control and Revegetation Plan. The ACFCWCD shall prepare a Soil Erosion Control and Revegetation Plan that addresses temporary construction-related temporary erosion control and provides permanent erosion control through revegetation and other means. The Plan, which can be a part of the project SWPPP see (HYDRO-2) shall be incorporated into the Project's Construction Documents. The Construction Plans shall specify erosion and sediment control measures, including Best Management Practices (BMPs) to control short-term construction-related water quality impacts. BMPs shall include at a minimum the following measures (where applicable):

- Limiting access routes and stabilizing access points. Surface disturbance of soil and vegetation shall be minimized; existing access and maintenance roads shall be used wherever feasible.
- Stabilizing graded areas as soon as possible following completion of disturbance with seeding, mulching, and installation of erosion control materials such erosion control blankets and straw rolls, or other approved and effective methods. Only native seed and plant materials shall be used, unless otherwise approved by the Biologist.
- Delineating clearing limits, easements, setbacks, environmentally sensitive areas, and drainage courses by marking them in the field, and installing exclusion fencing, silt fencing, and/or coir logs or straw rolls.

- Stabilizing and preventing sediment from entering channels and outlets.
- If rainfall is expected to occur, using temporary sediment control measures, such as additional silt fencing, straw rolls, covering stock piles and directing runoff to sediment detention structures to filter and remove sediment.
- Use temporary measures, such as flow diversion, temporary ditches, and silt fencing or straw wattles.
- Any stockpiled soil shall be placed, sloped, and covered so that it would not be subject to accelerated erosion.
- Accidental discharge of all Project related materials and fluids into local waterways shall be avoided by using straw rolls or silt fences, constructing berms or barriers around construction materials, or installing geofabric in disturbed areas with long, steep slopes.
- After ground-disturbing activities are complete for each Project component constructed, all graded or disturbed areas shall be covered with protective material such as mulch and re-seeded with native plant species. The Erosion Control and Revegetation Plan SWPPP shall include details regarding site preparation, top soiling or composting, seeding, fertilizer, mulching, and temporary irrigation.

HYDRO-2: **Stormwater Pollution Prevention Plan.** A Stormwater Pollution Prevention Plan (SWPPP) and a Spill Control and Countermeasures Plan (SCCP) shall be prepared and implemented by the ACFCWCD's Construction Contractor following SWRCB standards for erosion control and stormwater management. Specific measures, as cited below, shall be adapted from the most current edition of the Stormwater Best Management Practice Handbook for Construction, published by the California Stormwater Quality Association (CASQA). The SWPPP shall include Best Management Practices (BMPs) to prevent or minimize stormwater pollution during construction activities, as well as addressing post construction stormwater management and permanent erosion control. The Project Erosion Control and Revegetation Plan, and Spill Control and Countermeasures Plan, shall be included as part of the SWPPP. Plan preparation and implementation shall be included in the Project's Construction Documents.

HYDRO-3: **Equipment Maintenance.** All refueling and/or maintenance of heavy equipment shall take place at a minimum of 50 feet away from the top of bank of creeks and all identified jurisdictional wetlands and Waters of the US drainage courses. The refueling/maintenance and construction staging area shall be bermed, graveled, or covered with straw and incorporate measures for capture of any accidental spills. All temporary construction lay-down and staging areas shall be restored upon completion of work with silt fences, straw rolls, and ground bags, etc. removed.

HYDRO-4: The ACFCWCD shall coordinate and consult with the Alameda County Water District and obtain a permit or approval for the following:

- Drilling for bridge piers or replacement wells that may penetrate groundwater aquifers.
- Provide continued access to existing monitoring wells and continue to cooperate with ACWD in monitoring activities.
- Relocate any wells that conflict with channel maintenance and construction elements, such as pedestrian bridges.

HYDRO-5: **Bridge Design.** ACFCWCD shall prepare and submit final bridge plans for all new vehicular and pedestrian bridges that cross waterways under jurisdiction by the City of Fremont. The bridge plans shall include structural engineering, geotechnical engineering, and hydraulic engineering information. The responsible designer shall be a State of California licensed Civil Engineer and shall be experienced in hydraulic analysis, bridge design, and flood channel and bank protection design. The Engineering Plans shall demonstrate conformity to City of Fremont, Alameda County, and FEMA floodplain management regulations and include design elevations of the bridge, conformity with 100-year flood elevation freeboard requirements, the locations and structural design of the bridge abutments with respect to flood flows, bridge loading, and channel bank protection requirements.

11. Land Use and Planning

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

Comments to Questions

a) **No impact.** The project is not within an established community, nor does it contain residential use.

b) **No impact.** The project does not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

Mitigation Measures

No mitigation measures are proposed.

12. Mineral Resources

	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?	☐	☐	☐	☒

Comments to Questions

a) **No impact**. The project area does not contain known mineral resources of value to the region and state.

b) **No impact.** The project does not contain a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Mitigation Measures

No mitigation measures are proposed.

13. Noise

	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 2 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?	☐	☐	☒	☐

Introduction

Sound is created when vibrating objects produce pressure variations that move rapidly outward into the surrounding air. The more powerful the pressure variations, the louder the sound perceived by a listener. The decibel (dB) is the standard measure of loudness relative to the human threshold of perception. Noise is the term given to the “unwanted” aspects of intrusive sound. Many factors influence how a sound is perceived and whether it is considered disturbing to a listener, including

the physical characteristics of sound (e.g., loudness, pitch, duration, etc.) and other factors relating to the situation of the listener (e.g., the acuity of a listener's hearing, the activity of the listener during exposure: sleeping, working, etc.). Environmental noise has a number of documented undesirable effects on human health and welfare both psychological (e.g., annoyance and speech interference) and physiological (e.g., hearing impairment and sleep disturbance).

Environmental Setting. The *City of Fremont General Plan Safety Element* (Chapter 10 - Noise and Vibration section) identifies motor vehicles, trains, industrial uses, and mechanical equipment as the City's most significant noise sources. The Project site is parkland within Coyote Hills Regional Park. State Highway 84 passes about a mile south of the Project site. Paseo Padre Parkway (identified in the *General Plant Mobility Element* as an important north-south arterial roadway) defines the western limit of urban development in the City of Fremont. The project area is limited to recreational use and has no substantial local noise sources. Traffic noise contours presented in the *Safety Element* (Diagram 10-9) show that daily average noise levels on the Project site are at or below 55 dB and are expected to remain so through the year 2030[22].

Regulatory Setting. The following policies and implementations taken from the *Safety Element* are relevant to assessing the noise impacts of the proposed Project.

Policy 10-8.5 (Construction Noise Levels) with **Implementation 10-8.5.B** (Construction Noise Mitigation)

Continue to apply the construction hours ordinance to new development to limit noise exposure created by construction activity. Apply best practices to further limit noise in sensitive areas and long-term projects, such as maintaining construction equipment in good condition and use of mufflers on internal combustion engines, installation of temporary noise barriers, prohibiting extended idling time of internal combustion engines, locating staging areas away from sensitive receptors and other feasible best management practices.

Policy 10-8.10 (Vibration Environment) with **Implementation 10-8.10.A** (New Development to meet FTA [Federal Transit Agency] Guidelines)

The FTA has developed criteria for judging the significance of vibration produced by transportation sources and construction activity, which the City of Fremont has adopted. Under FTA criteria, limiting vibration levels to 94 VdB[23] or less would avoid structural damage to wood and masonry

[22] City of Fremont, *City of Fremont General Plan, Safety* (Chapter 10), December 2011

[23] Vibrating objects in contact with the ground radiate energy through the ground, which is measured in vibration decibels (VdB). If such an object is massive enough and/or close enough to an observer, the ground vibrations can be perceptible and, if the vibrations are strong enough, cause damage to existing buildings. Background ground vibration levels in most inhabited areas are usually 50 VdB or lower, well below the threshold of perception (i.e., typically about 65 VdB).

buildings (which are typical of residential uses and most other vibration-sensitive receptors), while limiting vibration levels to 80 VdB or less would avoid significant annoyance to the occupants.[24], [25]

The FTA also has criteria for what constitute substantial adverse traffic noise increments, which are more stringent at higher levels of noise exposure (i.e., above 60 dB L_{dn}) than the incremental standards adopted by the City of Fremont, as shown in Table NOI-1.

Table NOI-1: FTA Incremental Transportation Source Noise Impact Criteria

Residential and other buildings where people normally sleep[1]		Institutional land uses with primarily daytime and evening uses[2]	
Existing L_{dn}	Allowable Noise Increment	Existing Peak Hour L_{eq}	Allowable Noise Increment
50	5	50	9
55	3	55	6
60	2	60	5
65	1	65	3
70	1	70	3

Notes:

1 This category includes homes, hospitals, and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.

2 This category includes schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material.

Source: Federal Transit Administration, Transit Noise Impact and Vibration Assessment, May 2006.

The City of Fremont's Standard Development Requirements that apply to all development projects include the following requirements for noise, as stipulated in Fremont Municipal Code Section 18.218.010:

(d) Noise.

(1) Construction Noise. To reduce the potential for noise impacts during construction, the following requirements shall be implemented:

(A) Construction equipment shall be well-maintained and used judiciously to be as quiet as practical.

(B) Construction, excavating, grading, and filling activities (including the loading and unloading of materials, truck movements, and warming of equipment motors) shall be limited as provided in Section 18.160.010.

[24] The FTA vibration annoyance threshold is sensitive the number of daily vibration events affecting a receptor. If such events are 30 or fewer, the 80 VdB limit applies, but the limit drops to 72 VdB if the number of events is 70 or more.

[25] Federal Transit Agency (FTA), Transit Noise and Vibration Impact Assessment, May 2006.

(C) All internal combustion engine-driven equipment shall be equipped with mufflers, which are in good condition and appropriate for the equipment.

(D) The contractor shall utilize "quiet" models of air compressors and other stationary noise sources where technology exists.

(E) Loading, staging areas, stationary noise generating equipment, etc., shall be located as far as feasible from sensitive receptors.

(F) The contractor shall comply with Air Resource Board idling prohibitions of unnecessary idling of internal combustion engines.

(G) Signs shall be posted at the construction site that include permitted construction days and hours, a day and evening contact number for the job site, and a contact number for the project sponsor in the event of noise complaints. The applicant shall designate an on-site complaint and enforcement manager to track and respond to noise complaints. (Ord. 27-2016 § 37, 12-6-16; Ord. 23-2018 § 41, 10-2-18.)

The proposed project would be required to comply with the following limitations on construction hours, as stipulated in Fremont Municipal Code Section 18.16.010:

(a) Except as modified herein, construction activity for development projects in any zoning district on any property within 500 feet of one or more residences, lodging facilities, nursing homes or inpatient hospitals shall be limited to the weekday hours of 7:00 a.m. to 7:00 p.m. and the Saturday or holiday hours of 9:00 a.m. to 6:00 p.m., while Sunday construction is not allowed. Construction activity for projects not located within five hundred feet of residences, lodging facilities, nursing homes or inpatient hospitals shall be limited to the weekday hours of 6:00 a.m. to 10:00 p.m. and the weekend or holiday hours of 8:00 a.m. to 8:00 p.m. A holiday shall be as defined in Section 2.35.010.

(b) Resident homeowners and their uncompensated volunteer workers performing construction activity on their own single-family detached home shall be limited to the weekday hours of 7:00 a.m. to 8:00 p.m. and the weekend hours of 8:00 a.m. to 8:00 p.m.

(c) This section shall not apply to construction necessary to prevent or repair an emergency condition, as reasonably determined by the city manager's designee.

(d) Projects requiring a permit under the authority of this code shall have construction hours noted on the cover sheet of the construction plans.

(e) Projects requiring a permit under the authority of this code, except additions and alterations to single-family residential homes or lots, shall have an all-weather notice board conspicuously placed adjacent to the most visible public right-of-way for the duration of construction activity. The placement, format and content of the notice board shall be prescribed by city staff, and shall contain, at a minimum, summary project information, allowable construction hours, and city staff contact information.

(f) The city manager's designee shall have the authority to modify these hours under any of the following conditions:

(1) To facilitate staff supervision or inspection or when the applicant is required to comply with more restrictive provisions of this code, state or federal law.

(2) When, based upon the nature of nearby uses and/or site-specific considerations, he or she makes a finding that such modified construction hours are reasonably foreseeable to result in an equal or superior level of comfortable enjoyment of life and property by the community.

(3) When the project is located in a right-of-way or easement or on publicly owned property, and such modified hours, on balance, would minimize disruption to the community as a whole, such as to facilitate the orderly flow of traffic or to reduce negative impacts on commercial or residential activity.

(g) Violations of the provisions of this section shall be considered a public nuisance as defined in Section 8.60.040 for purposes of enforcement and remedy. In addition to the provisions of Title 8, staff shall have the power to withhold inspections if construction hours are not observed. (Ord. 36-2005 § 1, 11-22-05. 1990 Code § 8-2205.)

Comments to Questions

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?

Less than significant impact. According to the noise contour map presented in the Safety Element (Diagram 10-9), the daily average noise background levels on most of the Project site are at or below 55 dB, substantially below the City's 65 dB "normally acceptable" level for "outdoor sports and recreation, neighborhood parks and playgrounds." The Project would not introduce new stationary noise sources to the site, nor would the Project contribute to substantial additional motor vehicle noise along site access roads. After the Project work is complete, noise levels in the project area and vicinity would remain within City General Plan standards for park and residential uses, respectively, a less than significant impact.

b) Generation of excessive groundborne vibration or groundborne noise levels?

Less than significant impact. The most vibration-intensive piece of construction equipment is a pile driver, but no pile driving would be required for the Project. For the proposed Project improvement/restoration work, the construction equipment would include excavators, loaders, dozers, graders, dump/concrete trucks, etc. during the Project construction period as shown in Table NO-2:

Table NOI-2: Ardenwood Creek Construction Equipment

Project Phase	Construction Duration	Dump Truck	Excavator	Bulldozer	18 wheelers	Pick up truck
Channel Grading	2 months	8 hrs/day	8 hrs/day	8 hrs/day	n/a	4 hrs/day
Bridge 1 (Patterson Ranch Road)	3 months	4 hrs/day	8 hrs/day	4 hrs/day	4 hrs/week	4 hrs/day
Bridge 2 (Chochenyo Trail)	1 month	4 hrs/day	8 hrs/day	n/a	4 hrs/week	4 hrs/day
Bridge 3 (D.U.S.T. Trail)	1 month	4 hrs/day	8 hrs/day	n/a	4 hrs week	4 hrs/day

These types of construction equipment are far less vibration-intensive than pile drivers. They would have to operate directly adjacent to vibration-sensitive buildings for extended periods for there to be a substantial potential for structural damage, or within a few hundred feet for there to be a substantial potential for annoyance to occupants of such buildings. The residences closest to the Project site are eight hundred feet or more east of the closest parcels where improvement/restoration work would occur. The only fixed vibration-sensitive receptor in the Coyote Hills Park is its Visitors Center, which is located between one-third and one-half mile west of the project work areas where work would occur. Thus, Project construction vibration impacts would be less than significant.

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 2 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?

Less than significant impact. Although the Project site is not within any local airport's land use plan or within two miles of an existing airport, it is located within 20 miles of all three of the Bay Area's major commercial airports: San Francisco International Airport, Oakland International Airport, and San Jose International Airport. And because of its location close to the San Francisco Bay shore, it is subject to frequent over-flights of aircraft on approach/departure routes that frequently follow the San Francisco Bay shore. But most of such over-flights are at relatively high altitude and the Project site is far outside the 65 dB daily average noise contours (i.e., the common federal metric of noise impact to noise-sensitive receptors) as recently determined around each major Bay Area airport. The proposed project is not located in the vicinity of a private airstrip. Thus, aircraft noise impacts on/near the Project site are less than significant.

Mitigation Measures

NOI-1: The following BMPs shall be incorporated into the construction documents to be implemented by the project contractor:

- Equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards.
- Use quietest type of construction equipment whenever possible, particularly air compressors.

- Locate stationary equipment, material stockpiles, and vehicle staging areas as far as practicable from sensitive receptors.
- Prohibit unnecessary idling of internal combustion engines.
- Designate a noise (and vibration) disturbance coordinator at the ACFCWCD who shall be responsible for responding to complaints about noise (and vibration) during construction. The disturbance coordinator shall determine the cause of the noise complaint (e.g., starting too early, bad muffler) and determine and implement reasonable measures warranted to correct the problem.
- Limit noise generating activities to the weekday hours of seven a.m. to seven p.m. and the Saturday or holiday hours of nine a.m. to six p.m., with Sunday noise not allowed per City noise ordinance.

14. Population and Housing

	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?	☐	☐	☐	☒

Comments to Questions

a) **No impact.** The project does not involve housing, business development, road extension or other infrastructure that would affect population change.

b) **No impact.** The project would not displace people or housing.

Mitigation Measures

No mitigation measures are proposed.

15. Public Services

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

Comments to Questions

Less than significant impact. See discussion below.

Fire Protection. The Fremont Fire Department (FFD) is responsible for providing the rapid delivery of emergency fire suppression, emergency medical services, technical rescue, hazardous materials response, and fire prevention to the City of Fremont. Service is delivered throughout Fremont from eleven fire stations. Fire Station 10 (5001 Deep Creek Road) is the closest fire station to the project site, located approximately 1.3-mile northeast of the project site. Fire Station 10 is staffed with one Fire Company (three firefighters) and is equipped with a fire engine, a patrol car, and a utility vehicle for response to various call types. Fremont Fire Department is the primary provider of fire protection services to Coyote Hills Regional Park and the project area. On occasion, private paramedic companies serving Alameda County arrive first for emergency calls in the Park.

The East Bay Regional Park District Fire Department (EBRPD-FD) is a branch of the Public Safety Division within EBRPD that is comprised of fire and lifeguard services. The fire department provides all typical emergency services including fire suppression, search and rescue, fuels management, and pre-hospital emergency medical care. EBRPD-FD responds to incidents concurrently with other responsible fire agencies. EBRPD-FD's response area includes both parklands and areas adjacent to parklands. EBRPD-FD provides secondary wildland fire response in support of City of Fremont for this site.

The proposed project would neither add to, nor change the area of responsibility of the Fremont Fire Department. No change to anticipated number of visitors, or use would occur in the project vicinity. Implementation of the proposed project would not create a need for expanded or new fire facilities in Fremont or EBRPD. The project would not affect governmental facilities or generate the need for additional services because of project implementation. Replacement of culverts with

clearspan bridges would not affect service response times within the park. The impact on fire protection services would be **less than significant.**

Police Protection. The Fremont Police Department (FPD) provides police services in the city of Fremont. FPD is located at 2000 Stevenson Boulevard in central Fremont, approximately five miles east of the project site. All the Department's business is conducted, and police services are dispatched, from this location. The FPD does not have any sub-stations, and no new stations are planned at this time. FPD provides patrol coverage of Fremont in three patrol zones (Zone 1, Zone 2, and Zone 3). The proposed project is located at the northwest corner of Zone 2, which covers portions of central and northern Fremont. According to interviews conducted with the Department for the Patterson Ranch Planned District EIR (2010), Zone 2 is patrolled three to four officers at any given time.

East Bay Regional Park District Police Services (EBRPD-PD) maintains a staff of full-time professional police officers who are based out of Lake Chabot Regional Park in Castro Valley along with substations operated in Orinda and Antioch. At peak season during the summer, EBRPD Public Safety Division is staffed by approximately five hundred personnel, including 65 sworn police officers. The department includes an Air Support Unit, Marine Patrol Unit, Equestrian Patrols, K-9 Unit, Special Enforcement Unit, Investigations Unit, and a 24-hour per day 911 Communications Center.

U.S. Fish and Wildlife agents are stationed at Don Edwards National Wildlife Refuge adjacent to and south of Coyote Hills Regional Park. Fish and Wildlife Agents perform routine patrols of the area and are occasionally in the Park, which results in the benefit of an increased law enforcement presence.

An additional measure of patrol and outreach in the park system is provided by EBRPD's Volunteer Trail Safety Patrol. The Volunteer Trail Safety Patrol is comprised of five patrol groups: the Volunteer Mounted Patrol, the Volunteer Bicycle Patrol, the Volunteer Hiking Patrol, the Companion Dog Patrol, and the Volunteer Marine Safety Unit. Patrol members observe and report safety issues, incidents, and emergencies; they educate visitors about resources, programs, facilities, and rules; and perform outreach to foster positive relationships among varied trail user groups.

The Fremont Police Department currently patrols the project site, as well as providing immediate response to emergencies within the existing Coyote Hills Regional Park. The proposed project would not increase the number of visitors, use, or availability of service personnel. Implementation of the proposed project would not create a need for expanded or new police facilities in Fremont or EBRPD.

The project would not affect governmental facilities or generate the need for additional services because of project implementation. Construction of bridges over the existing creeks may improve service response times within the park. The impact on police protection services would be **less than significant.**

Schools. The project would not construct any housing or generate additional population. There would be no effect on the student population or schools. There would be **no impact** on schools.

Parks. The project consists of channel maintenance and infrastructure replacement within existing Coyote Hills Regional Park. It would not increase local or regional population or require new or physically altered park facilities to maintain acceptable service ratios.

The project may temporarily affect visitor access to portions of Coyote Hills Regional Park but would not necessitate park closure. This is a temporary impact and would be **less than significant.**

Other Public Facilities. The proposed project would not require other new or physically altered public facilities, such as libraries, to maintain acceptable service ratios. The project would improve creek channel conveyance and flood retention capabilities. This is a **less than significant, beneficial impact.**

Mitigation Measures

No mitigation measures are proposed.

16. Recreation

	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?	☐	☐	☒	☐

Comments to Questions

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?

Less than significant impact. Improvement of the existing creek crossings on Park trails would not increase trail use. The bridges would facilitate improved access to trails, but no improvements to the park entry or other visitor serving facilities is proposed. Recreation impacts would be less than significant.

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?

Less than significant impact. The project includes the construction of clearspan bridges to replace existing deteriorating culverts that support recreational trails within the park. Temporary impacts to

the environment may occur during construction but would be managed by implementation of the mitigation measures contained in this Initial Study and required as a part of regulatory permitting. Temporary impacts would be less than significant.

Mitigation Measures

No mitigation measures are proposed.

17. Transportation

	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?	☐	☒	☐	☐

Comments to Questions

a) **No impact**. The project would replace culverts that support existing trails and a park access road with clearspan bridges. These existing facilities are consistent with City of Fremont plans and EBRPD Master Plan and Coyote Hills Regional Park Land Use Plan.

b) **No impact**. The project would not generate additional vehicle miles traveled nor increase existing traffic facilities beyond existing condition. This is not a residential project.

c) **No impact**. The project would not alter the existing design or geometry of existing roads and trails.

d) **Less than significant with mitigation incorporated.** Construction of the new bridge at Patterson Ranch Road may temporarily impact vehicle access to the Coyote Hills Visitor Center and park facilities west of Ardenwood Creek. This is a temporary impact. Implementation of Mitigation Measure **TRA-1** would reduce potential impacts to a less than significant level.

Mitigation Measures:

TRA-1 ACFCWCD would coordinate with EBRPD to maintain emergency access to the Park Visitor's Center and other facilities as needed during project construction.

18. Tribal Cultural Resources

	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 Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)? Or	☐	☐	☐	☒
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

Introduction

California Assembly Bill [AB] 52, requires that Lead Agencies evaluate a project's potential to impact Tribal Cultural Resources, including sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe and are one of the following:

- Included or determined to be eligible for inclusion in the California Register of Historical Resources
- Included in a local register of historical resources
- A resource determined by the lead agency to be significant, based on established criteria such as:
    - A "historical resource"
    - a "unique archaeological resource"
    - a "nonunique archaeological resource" if it is included or determined to be eligible for inclusion in the California Register of Historical Resources.

AB 52 also gives Lead Agencies the discretion to determine whether a resource qualifies as a "tribal cultural resource." The law requires a public agency consult with local Native American tribes that have requested placement on that agency's notification list for CEQA projects.

Within 14 days of determining that a project application is complete, or a decision by a public agency to undertake a project, the Lead Agency must notify tribes of the opportunity to consult on the Project, should a tribe have previously requested to be on the agency's notification list. California Native American tribes must be recognized by the California Native American Heritage Commission (NAHC) as traditionally and culturally affiliated with the Project site and must have previously requested that the Lead Agency notify them of projects. Tribes have 30 days following notification of a project to request consultation with the Lead Agency.

The purpose of the consultation is to inform the Lead Agency in its identification and determination of the significance of tribal cultural resources. If a project is determined to result in a significant impact on an identified tribal cultural resource, the consultation process must occur and conclude prior to the adoption of the environmental document.

Tribal Consultation. On January 28, 2021, the District sent outreach letters pursuant to the consultation requirements of AB 52 to the tribes listed in the contact list provided by the Native American Heritage Commission (NAHC) on January 5, 2021. The letters from the District, sent to the individuals listed below, described the Project, provided maps of the Project site, and invited the tribes to request consultation should they have any concerns.

Table TRI-1 Native American Heritage Commission Tribal Consultation List
Alameda County January 5, 2021

Correspondence Recipient	Response Received
Amah Mutsun Tribal Band of Mission San Juan Bautista Irenne Zwierlein, Chairperson 789 Canada Road Woodside, CA, 94062	No
Costanoan Rumsen Carmel Tribe Tony Cerda, Chairperson 244 E. 1st Street Pomona, CA, 91766	No
Indian Canyon Mutsun Band of Costanoan Kanyon Sayers-Roods, MLD Contact 1615 Pearson Court San Jose, CA, 95122	No
Indian Canyon Mutsun Band of Costanoan Ann Marie Sayers, Chairperson P.O. Box 28 Hollister, CA, 95024	No
North Valley Yokuts Tribe Katherine Perez, Chairperson P.O. Box 717 Linden, CA, 95236	Yes
North Valley Yokuts Tribe Timothy Perez, MLD Contact P.O. Box 717	No

Correspondence Recipient	Response Received
Linden, CA, 95236	
The Ohlone Indian Tribe Andrew Galvan, P.O. Box 3388 Fremont, CA, 94539	No
The Confederated Villages of Lisjan Corrina Gould, Chairperson 10926 Edes Avenue Oakland, CA, 94603 Phone: (510) 575 - 8408 cvltribe@gmail.com	No
Muwekma Ohlone Indian Tribe of the SF Bay Area Monica Arellano 20885 Redwood Road, Suite 232 Castro Valley, CA, 94546 Phone: (408) 205 - 9714 marellano@muwekma.org	No
Muwekma Ohlone Indian Tribe of the SF Bay Area Charlene Nijmeh, Chairperson 20885 Redwood Road, Suite 232 Castro Valley, CA, 94546	No

Of the ten Native American individuals/groups contacted, one response was received from Chairperson Katherine Perez, of the Northern Valley Yokut/Ohlone/Bay Mewuk Tribe.

The correspondence included a request for information regarding the project's environmental review process, alternatives, significant effects, mitigation measures and cumulative impacts to tribal cultural resources. The tribe also requested information on design options to avoid impact to tribal cultural resources, environmental document scope, pre-project survey, tribal cultural resource identification, significance evaluations and culturally appropriate treatment.

The correspondence was also a formal request to allow Northern Valley Yokut and Nototomne Cultural Preservation tribal representatives to observe and participate in all cultural resource surveys and results of record searches. If tribal cultural resources are identified within the project area or proximity, tribal monitors must be present for all ground disturbing activities.

On March 12, 2021, District representatives, the consulting archaeologist and Chairperson Perez met at the project site to review Tribal Cultural Resource issues. The following concerns were identified:

- A request for documentation and maps of the original creek alignment in the project vicinity (provided in subsequent correspondence).
- A request for a Native American monitor during excavation to review sediment.
- Culvert Replacement CLV-ARD-1 – The Tribe is concerned that the removal of the existing road and culverts and the proposed construction of the new bridge could expose and impact prehistoric materials.

- Culvert Replacement CLV-ARD 2 (Chochenyo Trail) – The Tribe is concerned that the removal of the culvert could expose and impact prehistoric materials.
- Culvert Replacement CLV-ARD 3 (D.U.S.T. Trail) – No concerns were expressed by Chairperson Perez.

During the meeting, attended by ACFCWCD staff and the consulting archaeologist, it was clarified that the bridges CLV-ADR 1 and 2 would be installed within the built footprint (levee/paths) created for the park. During the inspection, Chairperson Perez also noted Franciscan chert fragments present along the bike/pedestrian trail. The consulting archaeologist explained that the Franciscan chert was not cultural (i.e., not the result of Native American manufacture). It was explained that chert of this type is often quarried at various locations in the East Bay and used for fill and road surfacing.

Chairperson Perez requested a Native American monitor be present during the excavation for the bridge footings. The District agreed to include the addition of Worker Awareness Training and retention of both Archaeological and Native American monitors in event of a significant find.

Comments to Questions

a-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 Section 5020.1(k)?

No impact. No NRHP or CRHR listed, determined, or pending archaeological sites, significant local, state or federal historic properties, landmarks, or other resources have been identified within or adjacent to the APE.

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

Less than significant impact. The APE is within an area considered high archaeological sensitivity based on research that used the number of recorded archaeological sites and proximity to flowing or other water sources to provide a qualitative sensitivity rating for selected areas of Alameda County. In addition, correspondence received from the Northern Valley Yokut/Ohlone/Bay Miwuk Tribe stated that there is a likelihood that ancestral remains or cultural resources may be found. Mitigation Measures **CUL-1** and **CUL-2** include tribal consultation if a find is encountered and would be implemented to reduce potential impacts to less than significant.

Mitigation Measures:

No additional mitigation measures are proposed.

19. Utilities and Service Systems

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

Comments to Questions

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?

Less than significant impact. The project includes replacement of the existing culverts on Patterson Ranch Road with a clearspan bridge. Existing underground utilities within this area may need to be replaced as part of project work and would be located within the project area footprint. No new or expanded facilities would be installed as part of the project. This is a less than significant impact.

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

No impact. The project does not involve development that would use nor need water.

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?

No impact. The project does not involve development that would use nor need wastewater disposal.

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?

Less than significant impact. The project does not involve development that would generate solid waste more than State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals. Construction of the proposed project would generate a small amount of construction and demolition waste. Construction materials associated with project implementation would be recycled as part of project BMPs and consistent with local ordinances.

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Less than significant impact. The project does not involve development that would generate solid waste beyond project construction. Construction of the proposed project would generate a small amount of construction and demolition waste. Construction materials associated with project implementation would be recycled as part of project BMPs and consistent with local ordinances.

Mitigation Measures:

No mitigation measures are proposed.

20. Wildfire

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

Comments to Questions

a-d) **No impact**. The project is not located in or near state responsibility areas or lands classified as very high fire hazard severity zones.

Mitigation Measures:

No mitigation measures are proposed.

21. Mandatory Findings of Significance

	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 would cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

Comment to Questions

a) The proposed project would not contribute to potentially significant cumulative impacts on biological resources, as all impacts are temporary and would be addressed through Project Controls and Construction Best Management Practices.

b) The proposed project would contribute incrementally to cumulative air pollutant emissions, and noise. Project-related air quality emissions would be below the BAAQMD significance thresholds for construction emissions, with implementation of Mitigation Measure AIR-1, and the project would not make cumulatively considerable contributions to the Bay Area's regional problems with ozone or particulate matter. Thus, by complying with the regional air quality plan, cumulative air quality emission impacts of the project would be less-than-significant.

Operation of the project would have a less-than-significant impact on increases in ambient noise levels in the project vicinity. Implementation of Mitigation Measure NOI-1 would reduce temporary construction noise impacts to a less-than-significant level. The project is not expected to cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street and highway system. Therefore, temporary project-related vehicle trips would not cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. The project would not result in cumulatively considerable noise impacts and, therefore, no significant cumulative noise impacts are expected.

c) As discussed in Section VIII. Hazards and Hazardous Materials, the project would follow all laws and regulations involving the use and transport of hazardous materials and would not cause potential health risks to the public. Mitigation measures have been included to reduce the impacts of Hazards and Hazardous Materials to a ***less than significant*** level.

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4.0 REFERENCES

Alameda County Flood Control & Water Conservation District (ACFCWCD). 2016. San Leandro Creek Watershed webpage. http://acfloodcontrol.org/resources-go/explore-watersheds/sanleandro-creek-watershed#features.

Alameda County Water District, Urban Water Management Plan 2015-2020, available online at: http://www.acwd.org/index.aspx?nid=365.

Alameda County, Scenic Route Element of the General Plan, May 1966, Amended May 5, 1994, Scenic Route Element of the General Plan Map.

BAAQMD. Air Quality Summary Reports. http://www.baaqmd.gov/about-air-quality/air-quality-summaries

BAAQMD. Highway Screening Analysis Tool. http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools

BAAQMD. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. May 2012.

BAAQMD. Roadway Screening Analysis Calculator. http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools

BAAQMD. Stationary Source Screening Analysis Tool. http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools

Balance Hydrologics, Inc. April 2010. *Hydromodification Control requirements for the Tract 8035 Patterson Ranch Project*, Berkeley CA.

Balance Hydrologics, Inc. July 14, 2000. *Drainage Report and Analysis of Hydrologic Opportunities and Constraints at Ardenwood 2000*, Alameda County California.

Bay Area Air Quality Management District (BAAQMD). *California Environmental Quality Act Air Quality Guidelines*. May 2017.

Bay Area Air Quality Management District (BAAQMD). *California Environmental Quality Act Air Quality Guidelines*. May 2017.

Botti, F., D. Warenycia, and D. Becker. *Utilization by Salt Marsh Harvest Mouse (Recthrodontamy raviventris halicoetes) of a Non-Pickleweed Marsh*. California Fish and Game Bulletin 72: 62-84. 1982.

Calflora, 2018. Information on California plants for education, research and conservation with data contributed by public and private institution and individuals, including the Consortium of California Herbaria. http://www.calflora.org/. Accessed June 6, 2018.

California Air Pollution Control Officers Association (CAPCOA). *California Emissions Estimator Model (CalEEMod) User's Guide*. http://www.caleemod.com/

California Air Resources Board (CARB). Summary: Diesel Particulate Matter Health Impacts. https://ww2.arb.ca.gov/index.php/resources/summary-diesel-particulate-matter-health-impacts

California Burrowing Owl Consortium (CBOC). 1993. *Burrowing Owl Survey Protocol and Mitigation Guidelines*. J. of Raptor Research Report 9:171-177.

California Department of Conservation, Farmland Mapping and Monitoring Program, California Important Farmland Finder, available online at: https://maps.conservation.ca.gov/DLRP/CIFF/.

California Department of Fish and Game (CDFG). 2000. *Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities*. Revised May 8, 2000. Available online at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=17551. Accessed May 2017.

California Department of Fish and game (CDFG). 2012. *Staff Report on Burrowing Owl Mitigation*. State of California Natural resources Agency. Department of Fish and Game.

California Department of Fish and Wildlife (CDFW), 2018a. California Natural Diversity Database (CNDDB) Rarefind version 5 query of the Newark USGS 7.5-minute topographic quadrangles, Commercial Version. Version: June 3, 2016. Accessed May 2017.

California Department of Fish and Wildlife (CDFW). 2018. Special Animals List. Periodic publication. 65 pp. Available online at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406. Accessed May 2017.

California Department of Fish and Wildlife (CDFW). 2018. State and Federally Listed Endangered and Threatened Animals of California. Natural Diversity Database, Wildlife and Habitat Data Analysis Branch.

California Department of Fish and Wildlife (CDFW). 2018a. Special Animals. Natural Diversity Database, Wildlife and Habitat Data Analysis Branch.

California Department of Fish and Wildlife RareFind CNDDB Version 05/2017

California Department of Forestry and Fire Protection, *California Fire Hazard Severity Zone Map Update Project,* available online at: http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_zones_maps. Accessed 30 April 2018.

California Department of Toxic Substances Control, EnviroStor database, available online at: http://www.envirostor.dtsc.ca.gov/public/search.asp?cmd=search&reporttype=CORTESE&site

_type=CSITES,OPEN,FUDS,CLOSE&status=ACT,BKLG,COM&reporttitle=HAZARDOUS+WASTE+AND+SUBSTANCES+SITE+LIST.

California Department of Transportation, California Scenic Highway Mapping System, available online at: http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/index.htm

California Department of Water Resources (DWR). January 20, 2006. California's Groundwater Bulletin #118 San Francisco Bay Hydrologic Region Santa Clara Groundwater Basin, Niles Cone Subbasin.

California Native Plant Society (CNPS), 2018. Inventory of Rare and Endangered Plants for the Newark U.S. Geographical Survey (USGS) 7.5-minute topographic quadrangles. http://www.rareplants.cnps.org/. Accessed May 2017.

California Native Plant Society (CNPS). 1998. Mitigation Guidelines Regarding Impacts to Rare, Threatened and Endangered Plants.

California Natural Diversity Database (CNDDB). 2017. Reported Occurrences for the Newark 7.5-minute topographic quadrangles. Wildlife Conservation Division. Sacramento, California.

CARB, EMFAC Web Database. https://www.arb.ca.gov/emfac/

Circle Point. September 2010. *Final Environmental Impact Report Volume 1- Modified Recirculated Draft EIR-Patterson Ranch Planned District.* City of Fremont.

Circle Point. September 2013. *Addendum to the Patterson Ranch Planned District.EIR*. City of Fremont.

CirclePoint. September 2010. *Final Environmental Impact Report Volume I – Modified Recirculated Draft EIR: Patterson Ranch Planned District*. City of Fremont.

City of Fremont, City of Fremont General Plan, Adopted December 2011.

City of Fremont, Environmental Services Division, Waste Handling Guidelines, July 2015.

City of Fremont, Final Environmental Impact Report, Volume I – Modified Recirculated Draft EIR, State Clearinghouse #2007102107, Patterson Ranch Planned District, September 2010.

City of Fremont. *City of Fremont General Plan Update Draft and Final EIR*, 2011.

Condor Country Consulting. November 2003. *Wet Season Branchiopod Survey Report, Patterson Ranch*.

East Bay Regional Park District. 2005. *Initial Study and Proposed Mitigated Negative Declaration for Coyote Hills Regional Park Land Use Plan Fremont, Alameda County, California*. February 2005.

East Bay Regional Park District. 2006. *Ardenwood Historic Farm Regional Preserve Land Use Plan Amendment*. August 2006.

East Bay Regional Park District. February 2005. *Initial Study and Proposed Mitigated Negative Declaration for Coyote Hills Regional Park Land Use Plan*.

East Bay Regional Park District. February 2005. *Initial Study and Proposed Mitigated Negative Declaration for Demonstration Urban Stormwater Treatment Marsh Restoration Project, Coyote Hills Regional Park, Fremont, CA/*

Federal Emergency Management Agency (FEMA). 1983 and 1987. Flood Zone Maps for Fremont, California, Numbers 06001C0433G, 06001C0429G, and 06001C0440G.

Federal Highway Administration (FHWA), *Roadway Construction Noise Model User's Guide*, January 2006.

Federal Transit Agency (FTA), *Transit Noise and Vibration Impact Assessment*, May 2006.

H.T Harvey & Associates. August 2001.Ardenwood 2001 Wildlife Surveys, Burrowing Owl Survey Memorandum.

H.T. Harvey & Associates. April 2004.Patterson Ranch 2003-2004 Monitoring & Identification of Waters of the U.S.

H.T. Harvey & Associates. December 2001, revised April 2004. Patterson Ranch Biological Opportunities and Constraints Analysis.

H.T. Harvey & Associates. May 2000.Ardenwood Forest California Tiger Salamander 2002/2003 Report.

Hazard Management Services, Inc., Letter Report to Karla Cuero, Project Coordinator, East Bay Regional Park District, October 11, 2016.

Helm Biological Consulting. February 2004. *Soil Analysis for Evidence of Federally Listed Large Branchiopods at the Patterson Ranch Project*.

Holland, R. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. The Resources Agency, State of California, Department of Fish and Game, Non-Game Heritage Program. Sacramento, CA.

Lakes Environmental, SCREEN *View User's Guide*. https://www.weblakes.com/products/screen/resources/lakes_screen_view_user_guide.pdf

Mayer, K.E. and W. F. Laudenslayer, Jr. eds. 1988. *A Guide to Wildlife Habitats of California*. California Department of Forestry and Fire Protection. Sacramento. 166 pp.

McCarthy, A., for Wildlife Research Associates. 2013. *Preliminary Jurisdictional Determination Report for Ardenwood Creek Flood Protection and Restoration Project, Fremont, Alameda County, California*. October 2013.

Mills Associates Planning and Environmental Services with Questa Engineering Corporation. June 7, 1990. For East Bay Regional Park District. *Wetlands Enhancement & Restoration Plan for Coyote Hills Regional Park*.

Oakland Museum of California. 2010. *Creek and Watershed Map of Western Alameda County, A Digital Database.*

Office of Environmental Health Hazard Assessment (OEHHA). *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, February 2015.

Pacific Biology. July 2007. *Western Burrowing Owl Survey Report, Patterson Ranch Project Area*.

Pacific Biology. September 2007. *California Red-Legged Frog Site Assessment and Survey Report, Patterson Ranch Project Site, Fremont, Alameda County, CA*.

Questa Engineering Corporation. *Coyote Hills Restoration and Public Access Project - Existing Conditions and Opportunities and Constraints Report*. September 2018.

Questa Engineering Corporation. 2016. *Zone 5 Line P Ardenwood Creek Wetland Mitigation Area – Preliminary Jurisdictional Wetlands Delineation*. January 2016.

Questa Engineering Corporation. 2017. *Biological Resource Assessment; Coyote Hills Restoration and Public Access Project*. July 2017

Questa Engineering Corporation. 2017. *Coyote Hills Restoration and Public Access Project – Preliminary Jurisdictional Wetlands Delineation*. July 2017.

San Francisco Bay Area Wetlands Ecosystem Goals Project. 2015. *The Baylands and Climate Change: What We Can Do. Baylands Ecosystem Habitat Goals Science Update 2015*.

San Francisco Estuary Institute (SFEI). 2013. *Alameda Creek Watershed Historical Ecology Study*.

Sawyer, J.O. , T. Keeler-Wolf and Julie Evens. 2008. *A Manual of California Vegetation, Second Edition*. California Native Plant Society, Sacramento. 471 pp.

Sawyer, John O., Todd Keeler-Wolf, and Julie Evens. 2009. *A Manual of California Vegetation, Third Edition*. California Native Plant Society and California Department of Fish and Game, Sacramento, CA.

Shuford, W.D., and Thomas Gardali. 2005. *California Bird Species of Special Concern*. Published by Western Field Ornithologists, Camarillo, CA, and California Department of Fish and Game, Sacramento, CA.

Southern Alameda County GIS Authority, available online at: http://egis.fremont.gov/apps/public/

Stebbins, R.C. and Samuel McGinnis. 2012. *A Field Guide to Amphibians and Reptiles of California*. University of California Press, Berkeley, CA.

TRC, Existing Conditions Summary Report, Hazardous Materials, Patterson Ranch Habitat Project, Fremont, California, prepared for East Bay Regional Park District, c/o Questa Engineering Corporation, April 2017.

U.S. Fish and Wildlife Service (USFWS), 2000. *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants*. Revised January 2000. https://www.fws.gov/ventura/docs/species/protocols/botanicalinventories.pdf.

U.S. Fish and Wildlife Service (USFWS). 2008. *Birds of Conservation Concern 2008*. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 85 pp. Available online at: http://www.fws.gov/migratorybirds/].

Union Sanitary District website, available online at: https://www.unionsanitary.com/about-us/about-us/mission-facts-history,

WRA, Inc. October 2013. *Biological Resources Assessment Report, Ardenwood Creek Flood Protection and Restoration Project, Fremont, Alameda County, California*.

WRA, Inc. 2013. *Biological Resource Assessment Report; Ardenwood Creek Flood Protection and restoration Project, Fremont, Alameda County, California*. October 2013.

Xerces Society for Invertebrate Conservation (Xerces). State of the Monarch Butterfly Overwintering Sites in California, prepared for the U.S. Fish and Wildlife Service. Available online at: http://www.xerces.org/wp-content/uploads/2016/07/StateOfMonarchOverwinteringSitesInCA_XercesSoc_web.pdf. Accessed December 2018.

Biological Resources Literature Cited

Adams, P.B., Grimes, C.B., Hightower, J.E., Lindley, S.T., and M.L. Moser. 2002. Status review for North American green sturgeon, *Acipenser medirostris*. National Marine Fisheries Service. 58 pages.

Alameda Creek Fisheries Restoration Workgroup. 2000. An Assessment of the potential for restoring a viable steelhead trout population in the Alameda Creek watershed prepared by Andrew J. Gunther Jeffrey Hagar Paul Salop

Applied Marine Sciences, Inc. (AMS) 2009. Survey of intertidal habitat and marine biota at Treasure Island and along the western shoreline of Yerba Buena Island. Prepared for Treasure Island Redevelopment Project, San Francisco, CA. April 2009.

Barnhart, R.A. 1986. Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (Pacific Southwest) – Steelhead. Biological Report 82 (11.660), TR EL-82-4.

Baxter, R.K., Hieb, S. DeLeon, K. Fleming, and J. Orsi. 1999. Report on the 1980-1995 fish, shrimp, and crab sampling in the San Francisco Estuary, California. The Interagency Ecological Program for the Sacramento-San Joaquin Estuary. Technical Report 63. November 1999.

Baxter, R., Rich Breuer, Larry Brown, Mike Chotkowski, Fred Feyrer, Marty Gingras, Bruce Herbold, Anke Mueller Solger, Matt Nobriga, Ted Sommer, and Kelly Souza. 2008. Pelagic Organism Decline Progress Report: 2007 Synthesis of Results Prepared by: January 15, 2008

Beamesderfer, R., M. Simpson, G. Kopp, J. Inman, A. Fuller, and D. Demko. 2004. Historical and current information on green sturgeon occurrence in the Sacramento and San Joaquin rivers and tributaries. S.P. Cramer & Associates, Inc. 44 pages.

Bennett, W. A., W. J. Kimmerer, and J. R. Burau. 2002. Plasticity in Vertical Migration by Native and Exotic Estuarine Fishes in a Dynamic Low-Salinity Zone. Limnology and Oceanography 47(5):1496-1507

Busby, P.J., T.C. Wainwright, G.J. Bryant, L. Lierheimer, R.S. Waples, F.W. Waknitz and I.V. Lagomarsino. 1996. Status review of west coast steelhead from Washington, Idaho, Oregon and California. U.S. Department of Commerce. NOAA Technical Memo. NMFS-NWFSC-27. 261 p.

California Advisory Committee on Salmon and Steelhead Trout. 1988. Restoring the balance, 1988 annual report. Annual report to the California Department of Fish and Game and California Legislature.

California Department of Fish and Game. 2002. California Department of Fish and Game Comments to NMFS Regarding Green Sturgeon Listing. 129 p

Chapman, D.W. and T.C. Bjornn. 1969. Distribution of salmonids in streams with special reference to food and feeding. *In:* Northcote, T.C., editor. Symposium on salmon and trout in stream. Vancouver: H.R. MacMillan Lectures in Fisheries, University of British Columbia. Pp 153-176.

Everest, F.H. 1973. Ecology and management of summer steelhead in the Rogue River Fishery Research Rpt. No. &. (Project ARS 31 Final Rpt.) Oregon State Game Comm.

Good, T.P., R.S. Waples, and P. Adams (editors). 2005. Updated status of federally listed ESU of West Coast salmon and steelhead. U.S. Department of Commerce, NOAA Technical Memo. NMFS-NWFSC-66, 598 p.

Hallock, R.J., W.F. Van Woert, and L. Shapovalov. 1961. An evaluation of stocking hatchery reared steelhead rainbow (*Salmo gairdnerii gairdnerii*) in the Sacramento River system. California Department of Fish and Game Bulletin, No. 114.

Hanson, C.H., J. Coil, B. Keller, J. Johnson, J. Taplin, J. Monroe (Hanson Environmental). 2004. Assessment & Evaluation of the Effects of Sand Mining on Aquatic Habitat and Fishery Populations of Central San Francisco Bay and the Sacramento-San Joaquin Estuary. Hanson Environmental, Inc. October.

Hill, K.A. and J.D. Webber. 1999. Butte Creek spring-run Chinook salmon *Oncorhynchus tshawytscha*, juvenile outmigration and life history. 1995-1998. CDFG Inland Fish. Admin. Rpt. 99-5. 46 pp.

Lankford, S.E., Adams, T.E., and Cech, J.J. 2003. Time of day and water temperature modify the physiological stress response in green sturgeon, Acipenser medirostris. Comparative Biochemistry and Physiology A 135: 291-302.

Lee, D. S., C. R. Gilbert, C. H. Hocutt, R. E. Jenkins, D. E. McAllister, and J. R. Stauffer, Jr. 1980. Atlas of North American Freshwater Fishes. North Carolina State Museum of Natural History. 867 pp.

Lindley, S.T., R. Schick, A. Agrawal, M. Goslin, T.E. Pearson, E. Mora, J.J. Anderson, B. May, May, S. Greene, A. Low, D. McEwan, R.B. MacFarlane, C. Swanson, and J.G. Williams. 2006. Historical population structure of Central Valley steelhead and its alteration by dams. San Francisco Estuary and Watershed Science [online serial]. Vol. 5, Issue 1 (February 2006), Article 4.

Linville, R.G. 2006. Effects of excess selenium on the health and reproduction on White sturgeon (Acipenser medirostris): Implications for San Francisco Bay-Delta. Ph.D., Department of Animal Science, University of California, Davis, Davis

Luoma, S.N., and Presser, T.S. 2000. Forecasting selenium discharges to the San Francisco Bay-Delta Estuary: ecological effects of a proposed San Luis Drain extension: U.S. Geological Survey Open-File Report 00-416, 358 p

McEwan, D.R. and T. Jackson. 1996. Steelhead Restoration and Management Plan for California. California Department of Fish and Game, February 1996.

McEwan, D.R. 2001. Central Valley Steelhead. Contributions to the biology of Central Valley salmonids. R. Brown editor. California Department of Fish and Game Fish Bulletin No 179.

Meehan W.R. and T.C. Bjornn. 1991. Salmonid distribution and life histories. American Fisheries Society Special Publication. 19: 47-82.

Merkel & Associates. 2004. Baywide Eelgrass Inventory of San Francisco Bay. Prepared for California Department of Transportation in Cooperation with NOAA Fisheries. October 2004.

Merkel & Associates. 2008. Eelgrass Habitat Surveys for the Emeryville Flats and Clipper *Cove, Yerba Buena* Island. October 1999-2005, and 2007. Prepared for the California Department of Transportation. January 2008.

Merkel & Associates. 2010. San Francisco Bay eel grass inventory October-November 2009. Prepared for California Department of Transportation and National Marine Fisheries Service. November 2010.

Moyle PB, Foley PJ, Yoshiyama RM (1992) Status of green sturgeon in California, Unpublished report, NOAA-NMFS, Terminal Island, 11 pp

Moyle, P.B. and Cech, J.J. (2000) Hydromineral Balance. Fishes: An Introduction to Ichthyology. 5th Edition, Prentice Hall, Englewood Cliffs, NJ, 77-93.

Moyle, P.B. 2002. Inland fishes of California, Revised and Expanded. University of California Press, Berkeley.

Myers, J.M., R.G. Kope, G.J. Bryant, D. Teel, L.J. Lierheimer, T.C. Wainwright, W.S. Grant, F.W. Waknitz, K. Neely, S.T. Lindley, and R.S. Waples. 1998. Status review of chinook salmon from Washington, Idaho, Oregon, and California. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-35, 443 p.

Nakamoto, R.J., T.T. Kisanuki, and G.H. Goldsmith. 1995. Age and growth of Klamath River green sturgeon (Acipenser medirostris). Prepared for U.S. Fish and Wildlife Service. Klamath River Fishery Resource Office. Yreka, CA.

National Marine Fisheries Service. 2009. Public Draft Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring-run Chinook Salmon and the District Population Segment of Central Valley Steelhead. Sacramento Protected Resources Division. October 2009.

Nickelson, T.E., J.D. Rodgers, S.L. Johnson, and M.F. Solazzi. 1992. Seasonal changes in habitat use by juvenile coho salmon *(Oncorhynchus kitsutch)* in Oregon coastal streams. *Can. J. Fish. Aq. Sci.* 49:783-789.

Nobriga, M., P. Cadrett. 2003. Differences among hatchery and wild steelhead: evidence from Delta fish monitoring programs. Interagency Ecological Program for the San Francisco Estuary Newsletter. 14(3):30-38.

Rosenfield, J. A., and R. D. Baxter. 2007. Population dynamics and distribution patterns of longfin smelt in the San Francisco Estuary. Transactions American Fisheries Society 136:1577-1592.

Shirvell, C.S. 1990. Role of instream rootwads as juvenile coho salmon *(Oncorhynchus kitsutch)* and steelhead trout *(O. mykiss)* cover habitat under varying streamflows. *Canadian Journal of Fisheries and Aquatic Sciences* 47:852-861.

Skinner, J.E. 1962. An historical review of the fish and wildlife resources of the San Francisco Bay area. California Department of Fish and Game Water Project Branch Report 1.

U.S. Department of the Interior (Reclamation). 2008. Central Valley Project and State Water Project Operations Criteria and Plan Biological Assessment. Bureau of Reclamation, Mid-Pacific Region, Sacramento, CA. May 2008.

U.S. Fish and Wildlife Service (USFWS). 1970. Effects on fish resources of dredging and spoil disposal in San Francisco and San Pablo Bays, California. Special Report, November 1970, 36 pp.

U.S. Fish and Wildlife Service (USFWS). 1996. Recovery plan for Sacramento/San Joaquin Delta native fishes. November 1996.

U.S. Fish and wildlife Service (USFWS). 2008. Anadromous Fish Restoration Program, Stanislaus River Watershed Information. Site access June 17, 2009.

Williams, J.G. 2006. Central Valley Salmon. A Perspective on Chinook and Steelhead in the Central Valley of California. San Francisco Estuary and Watershed Science. Volume 4, Issue 3, Article 2.

Yoshiyama, R.M., F.W. Fisher, and P.B. Moyle. 1998. Historical abundance and decline of Chinook salmon in the Central Valley region of California. North American Journal of Fisheries Management 18:487-521.

Zimmerman, C.E., G.W. Edwards, and K. Perry. 2008. Maternal origin and migratory history of Oncorhynchus mykiss captured in rivers of the Central Valley, California. Final Report prepared for the California Department of Fish and Game. Contract P0385300. 54 pp.

Appendix A:

Aquatic Resource Assessment

Aquatic Resource Assessment

This Aquatic Resource Assessment (ARA) was prepared by Dr. Chuck Hanson of Hanson Environmental under contract to Questa Engineering. The ARA provides a description of existing conditions in the project area, the potential for presence of aquatic species with special-status, and the significance of the potential impacts of the proposed Project. The contents of the ARA were used in preparing the Biological Resources section of this IS/MND.

The primary information sources used to prepare ARA setting include federal, State, and local reports and published scientific studies pertaining to aquatic resources of Alameda Creek and San Francisco Bay. These primary sources were augmented by information collected during biological reconnaissance surveys of lower Alameda and Ardenwood creeks and the estuary.

Regional Setting – Aquatic Resources

Alameda Creek is a major Bay-Area tributary to South San Francisco Bay. San Francisco Bay provides habitat for a variety of fish species, which may inhabit the system year-round or on a seasonal basis. Extensive fishery surveys have been conducted since 1980 by the California Department of Fish and Wildlife (CDFW) in South San Francisco Bay (Baxter et al. 1999). Fish species inhabiting the South Bay include northern anchovy, Pacific herring, flatfish, surfperch, gobies, sharks and rays, smelt, Chinook salmon and steelhead, and a wide variety of other species (Baxter *et al.* 1999; Wang 1986). In addition to the fish community, the South Bay also provides habitat supporting a diverse assemblage of benthic and epibenthic macroinvertebrates including clams, worms, crabs, and shrimp. Shrimp and crabs (macroinvertebrates) inhabit intertidal and subtidal areas similar to fish, have habitat requirements and preferences similar to many of the fish species (e.g., preferences for sandy substrate, rock outcroppings, etc.), and serve an important ecological role as key prey species for many of the fish inhabiting the South Bay.

The presence, abundance, and distribution of fish species in the Bay-Delta estuary is determined by numerous abiotic and biological factors (Moyle and Cech 2000). However, there are some general factors that exert a strong influence and explain much of the spatial and temporal variability in species abundance and distribution. In particular, physical and chemical factors such as temperature, salinity, water velocities and current patterns, substrate, habitat characteristics (e.g., rock outcroppings, emergent vegetation, etc.), and dissolved oxygen levels play important roles in determining the seasonal timing, habitat use, and spatial distribution of fish within various regions of San Francisco Bay and the Delta. Baxter *et al.* (1999) described the geographic distribution of various fish, shrimp, and crab species inhabiting the Bay-Delta estuary and their response to seasonal and geographic variation in salinity gradients and water temperature. The geographic distribution of many of these species is determined, in large part, by salinity tolerance and preference. Within the Bay-Delta estuary, salinities range from freshwater within the river systems to marine at the Golden Gate Bridge, as influenced by tidal exchange with nearshore coastal waters. Within the Bay-Delta estuary, freshwater and saltwater mix, forming a highly dynamic and productive estuarine habitat characterized by a wide range of salinities, both geographically and seasonally. The geographic distribution and habitat usage patterns for the fish, shrimp, and crabs inhabiting the Bay, which may vary by different life stages of the species, reflect in large part, the response to these salinity conditions. Salinity within the estuary varies from freshwater within the creeks and rivers to full strength seawater in the Central Bay near the Golden Gate. Within the South Bay, regional, localized, and seasonal variation in salinities affect the habitat suitability and occurrence of fish and macroinvertebrate species.

The estuary supports a diverse assemblage of resident and migratory fish species. Many of the species use the estuary on a seasonal basis (e.g., Pacific herring, northern anchovy, California halibut and Dungeness crab), taking advantage of favorable conditions to complete their life cycles (Baxter *et al.* 1999). Other species, such as Chinook salmon and steelhead, utilize the Bay-Delta estuary primarily as a migratory corridor between freshwater spawning and juvenile rearing areas within the creeks and rivers tributary to the estuary and the coastal marine waters.

Anadromous migratory species such as steelhead, Chinook salmon and longfin smelt move through the Bay-Delta estuary during passage to or from freshwater and coastal marine habitats. Most anadromous fish species, including Chinook salmon, steelhead, striped bass, American shad, and sturgeon, migrate through the northern portion of San Francisco Bay (e.g., Central Bay, San Pablo Bay, and Suisun Bay) during their upstream and downstream migrations into the Sacramento and San Joaquin river systems. A substantially smaller proportion of anadromous fish populations migrate into the South Bay tributaries such as Alameda Creek, Stevens Creek, Guadalupe River, Coyote Creek, and others. Fall-run Chinook salmon and steelhead are known to use South Bay tributaries as spawning and juvenile rearing habitat and have been the focus of several programs designed to improve habitat conditions and the abundance of both salmon and steelhead in these watersheds. A major restoration effort is currently underway on Alameda Creek to provide steelhead access to suitable spawning and juvenile rearing habitat upstream of the BART Weir which has been a complete barrier to upstream migration by adult steelhead and other fish. Steelhead and Chinook salmon produced in the South Bay tributaries migrate through the estuary as both emigrating juveniles and immigrating adults. The migration routes for juvenile and adult salmonids within the South Bay are, however, unknown. Adult Chinook salmon and steelhead migration typically occurs during the fall (September-December) and winter (January-March) with juvenile migration during the spring (February-May).

The 1982-86 South Bay Dischargers Association (SBDA) study provides data on the composition of the seasonal and permanent resident fish community in the waters of southern San Francisco Bay. The fish species collected in the open water habitat of the South Bay were similar to those collected in the sloughs including northern anchovy, staghorn sculpin, shiner perch, longfin smelt, white croaker, and striped bass. These and other surveys of the fishery and aquatic resources of the estuary (Baxter *et al.,* 1999; Skinner 1962; USFWS 1970; and others) provide a scientific foundation for identifying and assessing the potential for adverse effects as a result of proposed Project construction within the Alameda Creek watershed.

In general, the most common species of fish inhabiting San Francisco Bay include northern anchovy, Pacific herring, shiner perch, longfin smelt, white croaker, Pacific staghorn sculpin, bay goby, and plainfin midshipman. Limited plankton net data showed common species to be northern anchovy, Pacific herring, arrow/cheekspot goby, and yellowfin goby. Crab data showed the most common species to be Dungeness crab, Chinese mitten crab, red rock crab, graceful rock crab, and Pacific rock crab. Shrimp data showed the most common species to be California bay shrimp, blacktail bay shrimp, blackspotted bay shrimp, oriental shrimp, and Stimpson coastal shrimp. Results of fish egg and larval sampling demonstrate that a variety of fish species use portions of South San Francisco Bay as spawning and larval rearing areas as evidenced by the occurrence of both fish eggs and larvae. Northern anchovy, Pacific herring, and gobies consistently represent the most abundant ichthyoplankton in the South Bay.

Fish, shrimp, and crabs use habitats within San Francisco Bay for a number of functions including, but not limited to, adult and juvenile foraging, spawning, egg incubation and larval development, juvenile nursery areas, and as migratory corridors. Species composition, abundance, habitat use, and geographic distribution for many of these species vary seasonally and among years. Factors affecting species composition and geographic distribution within the South Bay are varied but include salinity gradients; variation in water temperature, water depth, and substrate; and availability of foraging and cover habitat (e.g., pilings,

rock outcroppings, submerged aquatic vegetation, and riprap). The estuarine environment within the South Bay is dynamic, varying in response to factors such as the magnitude of freshwater inflow from the Sacramento and San Joaquin river systems and other tributaries and resultant changes in salinity gradients, the movement of marine waters from nearshore coastal areas into and out of the Bay-Delta estuary on a tidal basis, wind and tidally driven currents, seasonal variation in water temperatures, and a variety of other physical and biological processes. The habitat use and functions of intertidal and subtidal areas vary in response to these physical factors as well as to differences in life-history characteristics and habitat requirements for the Bay's wide variety of species.

Local Setting - Ardenwood and Alameda Creeks

Ardenwood Creek is an earthen channel constructed in 1985. The constructed channel extends 2.65 miles from above Ardenwood Boulevard on the west to the confluence with lower Alameda Creek. Ardenwood Creek drains urban and suburban areas of Fremont. Flow discharged into Alameda Creek is controlled by a series of one-way tidal gates that only allow flow to discharge into Alameda Creek but prohibit flow from lower Alameda Creek from passing upstream into Ardenwood Creek. Sediment deposition, channel bank erosion, and colonization of the Ardenwood channel by cattails has reduced channel conveyance capacity and resulted in local flooding. Three existing culvert structures in the creek further reduce channel capacity and are proposed to be replaced by clear span bridges. The surface waters in Ardenwood Creek are fresh in the eastern portion of the channel and become increasingly brackish as the water moves through tidal marsh. Surface water is brackish in the downstream reach from approximately Patterson Ranch Road to the discharge into lower Alameda Creek. Species composition of the aquatic community, including resident fish, is expected to vary in response to variation in salinity gradients within the creek.

Ardenwood Creek discharges into a tidally influenced reach of lower Alameda Creek. The Union Pacific Railroad Bridge in the vicinity of Alvarado Boulevard generally marks the transition from freshwater marsh to tidal saline estuarine marsh. In the tidal reach of lower Alameda Creek, floodplain habitats are dominated by alkali bulrush, with associated species including cattail, California bulrush, water smartweed, bur-weed, broad-leaved cattail, matted water primrose, common spike rush, and pickle weed, and salt-grass near the tidal estuary. Salinity in upper Alameda Creek is freshwater becoming progressively more brackish (saline) moving downstream into the estuary where saltwater from South Bay mixes with freshwater from upper Alameda Creek. Land use along Alameda Creek transitions from urban housing development to the Don Edwards San Francisco Bay National Refuge and tidal estuarine habitat.

The fish community inhabiting Alameda Creek varies geographically in response to variation in salinity. The active freshwater channels of Ardenwood and lower Alameda creeks support or has supported a variety of native and non-native fish and other aquatic species. The Alameda Creek Fisheries Restoration Workgroup (2000) reviewed historic reports from 1900 through 1985 and identified the following native and non-native species known to have occurred in the freshwater reaches of the creek:

Table-1: Regional Fish Species

Native Fish	***Non-Native Fish***
Pacific lamprey California roach Hitch	Goldfish Carp Golden shiner

Sacramento blackfish Sacramento pike minnow Speckled dace Sacramento sucker Steelhead/rainbow trout Three-spine stickleback Sacramento perch Prickly sculpin Riffle sculpin Tule perch	White catfish Black bullhead Brown bullhead Mosquitofish Inland silversides Green sunfish Bluegill Smallmouth bass Largemouth bass Black crappie Bigscale logperch

Fishery surveys conducted in 2008 confirmed the presence of native and non-native predatory fish (Ochikubo, C and PJ Alexander 2009, Alameda Creek Flood Control Channel Predator Fish Surveys, East Bay Parks District Oakland, CA) inhabiting the freshwater reaches of the creek. Survey of ponded areas (day and night) identified the following fish in the channel:

- Sacramento sucker
- Sacramento pikeminnow
- Common carp
- Largemouth bass
- White catfish
- Hitch
- Prickly sculpin
- Bluegill
- Green sunfish
- Pacific lamprey (ammocoete)
- Goldfish
- Big scale logperch

The 2008 survey identified a number of larger predatory fish (largemouth bass and Sacramento pikeminnow) 100 mm to 250 mm long inhabiting the freshwater reaches of Alameda Creek. These survey results, from multiple years of survey by ACFCWCD, ACWD, and others suggest that the Alameda Creek Flood Control Channel supports a native and non-native community adapted to urban disturbance and a highly variable artificial hydrologic regime.

Otter trawls conducted as part of the 2008 fishery survey in the lower (tidal) zone identified shrimp, topsmelt, staghorn sculpin, northern anchovy, and starry flounder, reflecting the more saline environment. The 2008 surveys included water temperature measurements, which in August ranged from approximately 23°C to 24.5° C. The most frequently observed fish were typical of the estuarine/marine fish community of South San Francisco Bay.

The Alameda Creek estuary is tidally interconnected with near-shore waters of South San Francisco Bay. High salinity marine waters move upstream into the estuary during flood tides with a greater influence of downstream flow of freshwater into and through the estuary from Alameda Creek during ebb tides. The fish community of near-shore waters of South Bay in the immediate vicinity of the Alameda Creek estuary is characteristic of fish species composition found in other similar areas of the Bay and includes species such as north anchovy, Pacific herring, flatfish (e.g., California halibut, starry flounder, English sole), gobies, and perch. Juvenile and adult Chinook salmon and steelhead migrate through the South Bay to and from many South Bay tributaries. Longfin smelt juveniles and adults rear in the South Bay and may also spawn in South Bay tributaries. Green sturgeon and a large variety of other marine fish and invertebrates reside and forage as juveniles and adults in South Bay waters.

Habitats of Particular Concern (HAPC)

The two primary habitats of particular concern within San Francisco Bay are eel grass beds and native Olympia oyster beds.

Eel grass beds occur within the low intertidal and shallow subtidal zones of the Central Bay. Within the Central Bay, localized, shallow water subtidal areas have been colonized by eelgrass that serves important habitat and ecological functions within the estuary. As a consequence of the relatively high turbidity and suspended sediment concentrations (SSCs) naturally occurring within the Bay-Delta estuary light penetration (photic zone) limits the occurrence of submerged aquatic vegetation to relatively small, intertidal and shallow subtidal areas with higher salinity primarily within the Central Bay. The distribution of eel grass beds in San Francisco Bay (Hanson *et al.* 2004, Merkel & Associates 2008, 2010) shows small areas colonized in Richardson Bay, adjacent to the Alameda shoreline south of the Bay Bridge, near the Emeryville Marina, and in several locations along the Richmond shoreline. Eel grass beds have been identified along the eastern shoreline of Treasure Island and a smaller bed has been detected on the north side of Treasure Island (Merkel & Associates 2004). These eel grass beds provide important habitat for Pacific herring spawning and habitat for a number of fish and macroinvertebrates. No eel grass beds were identified in the proposed Project Area or immediately adjacent near-shore areas within South San Francisco Bay.
Native California oysters historically inhabited the intertidal and shallow subtidal areas within the South and Central Bays. As a result of pollution, degradation of water quality, loss of habitat, oyster drill predation, and other factors the oyster population was virtually eliminated from San Francisco Bay. Efforts are currently underway to restore oysters to the Central Bay in several areas such as adjacent to the Marin Rod and Gun Club. Native oyster populations have made a significant recovery in Central San Francisco Bay in recent years. Applied Marine Sciences (AMS 2009) reported observing native oysters throughout the lower intertidal zone of Treasure and Yerba Buena islands with the highest densities and greatest individual sizes observed along the west and north shorelines. Efforts to restore the native oyster population to the Central Bay region are continuing. There are no known live oyster beds in the vicinity of the proposed Project site or immediately adjacent near-shore waters of South San Francisco Bay.

Special-Status Aquatic Species

A number of species known to occur on the vicinity of the proposed Project site and adjacent waters of South San Francisco Bay are protected pursuant to federal and State endangered species laws or have been designated species of special concern by the CDFW. In addition, Section 15380(b) of the CEQA *Guidelines* provides a definition of rare, endangered, or threatened species that are not included in any listing, but whose "survival and reproduction in the wild are in immediate jeopardy" (endangered) or which are "in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens" or "is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered 'threatened' as that term is used in the federal Endangered Species Act." Species recognized under these terms are collectively referred to as "special-status species."

Winter-run Chinook Salmon

Status

Winter-run Chinook salmon are listed as an endangered species under the ESA and CESA.
Winter-run Chinook salmon historically migrated into the upper tributaries of the Sacramento River for spawning and juvenile rearing. With the construction of Shasta and Keswick dams' winter-run salmon no longer had access to historic spawning habitat within the upper watersheds. As a result of migration blockage, spawning and juvenile rearing habitat for winter-run Chinook is limited to the mainstem Sacramento River downstream of Keswick Dam. During the mid-1960s adult winter-run Chinook salmon returns to the Sacramento River were relatively high (approximately 80,000 returning adults). However, the population declined substantially during the 1970s and 1980s. The population decline continued until 1991 when the adult winter-run Chinook salmon population returning to the Sacramento River was estimated to be less than 200 fish. As a result of the substantial decline in abundance the species was listed as endangered under ESA. During the mid- and late 1990s the numbers of adult winter-run salmon returning to the Sacramento River varied substantially among years reflecting a variety of factors effecting production and survival including variation in Central Valley hydrology, ocean conditions, and others.

As with other Chinook salmon stocks, NMFS is continuing to evaluate the status of the winter-run Chinook salmon population and the effectiveness of various management actions implemented within the Sacramento River, Delta, and ocean to provide improved protection and reduced mortality for winter-run salmon, in addition to providing enhanced habitat quality and availability for spawning and juvenile rearing in the Sacramento River. NMFS has prepared a recovery plan for Central Valley winter-run Chinook salmon.

NMFS designated critical habitat for winter-run Chinook salmon which includes Central Bay but not South Bay where proposed Project activities would occur.

Life History

Winter-run Chinook salmon are an anadromous species spending 1-3 years within the ocean before migrating upstream into the Sacramento River to spawn. The majority of adult winter-run Chinook salmon returning to spawn are generally three-year-olds, however, the adult population also includes two-year-old and four-year-old Chinook salmon. Adult winter-run salmon migrate upstream through San Francisco Bay, Suisun Bay, and the Delta during the winter and early

spring months with peak migration occurring during March (Moyle, 2002). Adult winter-run Chinook salmon migrate upstream within the Sacramento River with adults spawning in the reach upstream of Red Bluff. Winter-run Chinook salmon spawn within the mainstem of the Sacramento River in areas where gravel substrate, water temperatures, and water velocities are suitable. Spawning occurs during the spring and summer (mid-April through August; Moyle, 2002). Egg incubation continues through the fall months.

Juvenile winter-run Chinook salmon rear within the Sacramento River throughout the year feeding primarily on aquatic insects. Juvenile winter-run salmon (smolts) migrate downstream through the lower reaches of the Sacramento River, Delta, Suisun Bay, and San Francisco Bay during the winter and early spring (December through May) as they migrate from the freshwater spawning and juvenile rearing areas into the coastal marine waters of the Pacific Ocean. The Sacramento River mainstem is the primary upstream and downstream migration corridor for winter-run Chinook salmon. Juvenile winter-run Chinook salmon may migrate from the Sacramento River into the lower reaches of channels within Suisun Marsh and the Delta during their downstream migration. The migration timing of juvenile winter-run Chinook salmon varies within and among years in response to a variety of factors including increases in river flow and turbidity resulting from winter and early spring storms.

Factors Affecting Abundance

A variety of environmental and biological factors have been identified that affect the abundance, mortality, and population dynamics of winter-run Chinook salmon. One of the primary factors that has affected population abundance of winter-run Chinook salmon has been the loss of access to historic spawning and juvenile rearing habitat within the upper reaches of the Sacramento River and its tributaries as a result of the migration barrier caused by Shasta and Keswick dams. Operation of the Red Bluff Diversion Dam (RBDD), which impeded adult upstream migration and increased vulnerability of juvenile winter-run Chinook salmon to predation mortality, has been identified as a factor affecting mortality within the river. In recent years, changes to Red Bluff Diversion Dam gate operations and construction of a new water diversion and fish screen have been made to provide improved access for upstream and downstream migrating winter-run Chinook salmon.

Water temperatures within the mainstem Sacramento River have also been identified as a factor affecting incubating eggs, holding adults, and growth and survival of juvenile winter-run Chinook salmon rearing in the upper Sacramento River. Modifications to Shasta Reservoir storage and operations and water temperature management have been implemented in recent years to improve water temperature conditions within the upper reaches of the Sacramento River.

Juvenile winter-run Chinook salmon are also vulnerable to entrainment at a large number of unscreened water diversions located along the Sacramento River and within the Delta in addition to entrainment and salvage mortality at the State Water Project (SWP) and Central Valley Project (CVP) export facilities. Changes in habitat quality and availability for spawning and juvenile rearing, exposure to contaminants and acid mine drainage, predation mortality by Sacramento pikeminnow, striped bass, and other predators, and competition and interactions with hatchery-produced Chinook salmon have all been identified as factors affecting winter-run Chinook salmon abundance. In addition, subadult and adult winter-run Chinook salmon are vulnerable to recreational and commercial fishing, ocean survival is affected by climatic and oceanographic conditions, and adults are vulnerable to predation mortality by marine mammals.

In recent years, a number of changes have been made to improve the survival and habitat conditions for winter-run Chinook salmon. Modifications have been made to reservoir operations for instream flow and temperature management, modifications been made to Red Bluff diversion gate operations, habitat

improvements such as the addition of spawning gravels have been made in the reach upstream of RBDD, and several large previously unscreened water diversions have been equipped with positive barrier fish screens. Changes to ocean salmon fishing regulations have also been made to improve the survival of adult winter-run Chinook salmon. Modifications to SWP and CVP export operations have also been made to improve the survival of juvenile winter-run Chinook salmon. These changes in management actions, in combination with hydrologic and oceanographic conditions in recent years, are thought to have contributed to abundance of adult winter-run Chinook salmon returning to the upper Sacramento River to spawn.

Presence in South San Francisco Bay

The majority of adult winter-run Chinook salmon migrate upstream in the mainstem Sacramento River, after having passed through Central Bay and Suisun Bay. The occurrence of adult winter-run Chinook salmon in the South Bay near where proposed Project activities would occur would be limited to the winter and early spring period of adult upstream migration. The majority of adult winter-run salmon are thought to migrate upstream through the Bay-Delta during the period from about December to March or early April. Since South San Francisco Bay is not part of the adult migration route the likelihood of adult winter-run Chinook salmon in the South Bay is low.

During their downstream migration, juveniles migrate through the Sacramento River, Suisun Bay, and Central Bay before entering coastal marine waters. The migration timing of juvenile winter-run Chinook salmon varies within and among years in response to a variety of factors, including increases in river flow and turbidity resulting from winter storms. Thus, potential presence of juvenile winter-run Chinook salmon in San Francisco Bay varies by season and among years within the period from December through May. Since South San Francisco Bay is not part of the juvenile migration route the likelihood of juvenile winter-run Chinook salmon in the Action Area is low.

Since winter-run Chinook salmon do not spawn within South San Francisco Bay there is no probability that the proposed Project would adversely affect winter-run Chinook salmon spawning, egg incubation, or early juvenile (fry) rearing stages.

Existing Conditions in the Project Site

The winter-run Chinook salmon population primarily inhabits the Sacramento River basin with spawning occurring primarily in the reach of the mainstem between Keswick Dam and Redd Bluff. Juvenile winter-run Chinook salmon migrate downstream through Northern and Central San Francisco Bays during their passage to the coastal Pacific marine waters.

Juvenile or adult winter-run Chinook salmon migrating through San Francisco Bay are not expected to migrate into South San Francisco Bay and therefore are not expected to occur in the vicinity of the Project site or be subject to effects of construction activity at the Project site. Winter-run Chinook salmon have not been detected in fishery monitoring from either Ardenwood or Alameda Creek.

Central Valley Spring-run Chinook Salmon

Status

Spring-run Chinook salmon are listed as a threatened species under the ESA and CESA. Spring-run Chinook salmon were historically widely distributed and abundant within the Sacramento and San Joaquin river systems (Yoshiyama *et al.* 1998). Spring-run Chinook salmon historically migrated upstream into the upper reaches of the mainstem rivers and tributaries for spawning and juvenile rearing. Construction of major dams and reservoirs on these river systems eliminated access to the

upper reaches for spawning and juvenile rearing and completely eliminated the spring-run salmon population from the San Joaquin River system. Spring-run Chinook salmon abundance has declined substantially and the geographic distribution of the species within the Central Valley has also declined substantially. Spring-run spawning and juvenile rearing currently occurs on a consistent basis within only a small fraction of their previous geographic distribution, including populations inhabiting Deer, Mill, and Butte creeks, the mainstem Sacramento River, several other local tributaries on an intermittent basis, and the lower Feather River. Recent genetic studies have shown that spring-run like Chinook salmon returning to the lower Feather River are genetically similar to fall-run Chinook salmon. Hybridization between spring-run and fall-run Chinook salmon, particularly on the Feather River where both stocks are produced within the Feather River hatchery, is a factor affecting the status of the spring-run salmon population. NMFS has developed a recovery plan for Central Valley spring-run Chinook salmon.

NMFS designated critical habitat for spring-run Chinook salmon which includes the Central Bay but not the South Bay near where proposed Project activities would occur.

Life History

Spring-run Chinook salmon are an anadromous species, spawning in freshwater and spending a portion of their lifecycle within the Pacific Ocean. Adult spring-run Chinook salmon migrate upstream into the Sacramento River system during the spring months but are sexually immature. Adult spring-run Chinook salmon hold in deep cold pools within the rivers and tributaries over the summer months prior to spawning. Spawning occurs during the late summer and early fall (late August through October) in areas characterized by suitable spawning gravels, water temperatures, and water velocities. Eggs incubate within the gravel nests (redds) emerging as fry during the late fall and winter. A portion of fry appear to migrate downstream soon after emerging where they rear within the lower river channels, and potentially within the Delta estuary, during winter and spring months. After emergence, a portion of the spring-run Chinook salmon fry remain as residents in the creeks and rear for a period of approximately one year. The juvenile spring-run Chinook salmon that remain in the creeks migrate downstream as yearlings primarily during the late fall, winter and early spring with a peak yearling migration occurring in November (Hill and Weber 1999). The downstream migration of both spring-run Chinook salmon fry and yearlings during the late fall and winter typically coincides with increased flow and turbidity associated with winter stormwater runoff.

Factors Affecting Abundance

A variety of environmental and biological factors have been identified that affect the abundance, mortality, and population dynamics of spring-run Chinook salmon. One of the primary factors that has affected population abundance of spring-run Chinook salmon has been the loss of access to historic spawning and juvenile rearing habitat within the upper reaches of the Sacramento River and its tributaries and San Joaquin River as a result of the migration barriers caused by construction of major dams and reservoirs. Operation of the Red Bluff Diversion Dam, which impeded adult upstream migration and increased the vulnerability of juvenile spring-run Chinook salmon to predation mortality, has been identified as a factor affecting mortality within the river. A new water diversion and positive barrier fish screen has recently been constructed to allow the Red Bluff Diversion Dam gates to remain open during most of the year, thereby improving migration conditions for juvenile and adult spring-run salmon and other migratory fish.
Water temperatures within the rivers and creeks have also been identified as a factor affecting incubating eggs, holding adults, and growth and survival of juvenile spring-run Chinook salmon. Juvenile spring-run Chinook salmon are also vulnerable to entrainment at a large number of unscreened water diversions

located along the Sacramento River and within the Delta in addition to entrainment and salvage mortality at the SWP and CVP export facilities. Changes in habitat quality and availability for spawning and juvenile rearing, exposure to contaminants, passage barriers and impediments, predation mortality by Sacramento pikeminnow, striped bass, and other predators, and competition and interactions with hatchery-produced Chinook salmon have all been identified as factors affecting spring-run Chinook salmon abundance. In addition, subadult and adult spring-run Chinook salmon are vulnerable to recreational and commercial fishing, ocean survival is affected by climatic and oceanographic conditions, and adults are vulnerable to predation mortality by marine mammals.

In recent years, a number of changes have been made to improve the survival and habitat conditions for spring-run Chinook salmon. Several large previously unscreened water diversions have been equipped with positive barrier fish screens. Habitat improvements have been made to benefit spring-run Chinook salmon. Changes to ocean salmon fishing regulations have been made to improve the survival of adult spring-run Chinook salmon. Modifications to SWP and CVP export operations have also been made to improve the survival of juvenile spring-run Chinook salmon. Improvements in fish passage facilities have also been made to improve migration and access to Butte Creek. These changes and management actions, in combination with hydrologic and oceanographic conditions, are thought to have contributed to abundance of adult spring-run Chinook salmon returning to spawn in Butte Creek and other habitats within the upper Sacramento River system in recent years.

Presence in South San Francisco Bay

The majority of adult spring-run Chinook salmon migrate upstream within the mainstem Sacramento River, after passing upstream through the Central Bay and Suisun Bay. The occurrence of adult spring-run Chinook salmon within Central Bay would be limited to the late winter and spring period (primarily March-May) of adult upstream migration. Since South San Francisco Bay is not part of the adult migration route the likelihood of adult spring-run Chinook salmon in the Action Area is low.

Juvenile spring-run Chinook salmon may migrate from the Sacramento River, including its tributaries, into the Delta and Central Bay during their downstream migration and also use the Bay-Delta estuary as a foraging area and migration pathway during the winter and early spring migration period. The occurrence of juvenile spring-run Chinook salmon in San Francisco Bay would be expected during late fall through spring (October-June), when water temperatures within the Bay-Delta would be suitable for juvenile spring-run Chinook salmon migration. Since South San Francisco Bay is not part of the juvenile migration route the likelihood of juvenile spring-run Chinook salmon in the proposed Project Area and adjacent near-shore waters of South San Francisco Bay is low.
Since spring-run Chinook salmon do not spawn within the South Bay there is no probability that the proposed Project would adversely affect spring-run Chinook salmon spawning, egg incubation, or early juvenile (fry) rearing stages. Spring-run Chinook salmon have not been detected in fishery monitoring from either Ardenwood or Alameda Creek

Existing Conditions in the Project Site

Juvenile and adult spring-run Chinook salmon are not expected to be present in the South Bay during their migration through San Francisco Bay. Spring-run Chinook salmon have not been detected in fishery monitoring from either Ardenwood or Alameda Creek. As a result, spring-run Chinook salmon are not expected to occur in the vicinity of the Project site or be subject to potential Project effects.

Central Valley and Central California Coast Steelhead

Status

The Central Valley steelhead Distinct Population Segment (DPS) is listed as threatened under the ESA but is not listed under CESA. NMFS designated critical habitat for Central Valley steelhead on September 2, 2005, which includes the Central Bay but not the South Bay near where proposed Project activities would occur. Central California Coast steelhead are also listed as a threatened species under the ESA but are not listed under CESA. NMFS designated critical habitat for Central California Coast steelhead that does include the South Bay since spawning and juvenile rearing occurs in streams tributary to South Bay.

Central Valley steelhead are produced in rivers and streams tributary to the Delta located upstream of the Carquinez Straight. Central California Coast are produced in rivers and streams located downstream of the Carquinez Straight. Both Central Valley and Central California Coast steelhead use the Central Bay as a migratory corridor.

Steelhead historically were distributed throughout the Sacramento and San Joaquin rivers. Steelhead were found from the upper Sacramento and Pit River systems (now inaccessible due to Shasta and Keswick Dams) south to the San Joaquin and possibly the Kern river systems (now inaccessible due to extensive alterations from numerous water diversion projects) and in both east and west-side Sacramento River tributaries (Yoshiyama *et al.* 1998). The present distribution has been greatly reduced (McEwan and Jackson 1996). Existing wild steelhead stocks in the Central Valley are mostly confined to the upper Sacramento River and its tributaries, including Antelope, Deer, and Mill creeks and the Yuba River. Populations may exist in Big Chico and Butte creeks and a few wild steelhead are produced in the American and Feather rivers (McEwan and Jackson 1996). The California Advisory Committee on Salmon and Steelhead (1988) reported a reduction of steelhead habitat from 6,000 miles historically to 300 miles currently. Dams block access to 80 percent of historic habitat and access to all historical spawning habitat for about 38 percent of historical populations (Lindley *et al.* 2006).

Historic Central Valley steelhead run sizes are difficult to estimate given the paucity of data but may have approached 1 to 2 million adults annually (McEwan 2001). By the early 1960s the steelhead run size had declined to about 40,000 adults (McEwan 2001). Over the past 50 years, the naturally spawned steelhead populations in the upper Sacramento River have declined substantially. Steelhead counts at the Red Bluff Diversion Dam (RBDD) declined from an average of 11,187 for the period of 1967 to 1977, to an average of approximately 2,000 through the early 1990s, with an estimated total annual run size for the entire Sacramento-San Joaquin system, based on RBDD counts, to be no more than 10,000 adults (McEwan and Jackson 1996, McEwan 2001). Steelhead escapement surveys at RBDD ended in 1993 due to changes in dam operations.
Nobriga and Cadrett (2003) compared coded wire tagged (CWT) and untagged (wild) steelhead smolt catch ratios at Chipps Island trawl from 1998 through 2001 to estimate that about 100,000 to 300,000 steelhead juveniles are produced naturally each year in the Central Valley.
Until recently, steelhead were thought to be extirpated from the San Joaquin River system. Monitoring has detected small self-sustaining populations of steelhead in the Stanislaus, Mokelumne, and Calaveras rivers, and other streams previously thought to be devoid of steelhead (McEwan 2001). Juvenile salmonid monitoring has been conducted at Oakdale and/or Caswell on the Stanislaus River since 1995 and is used to estimate abundance of out-migrating steelhead/rainbow trout to the San Joaquin River (USFWS 2008). Steelhead smolts also have been occasionally observed at Caswell State Park and Oakdale. Zimmerman *et al.* (2008) and NMFS (2009) have documented Central Valley steelhead in the Stanislaus, Tuolumne and Merced rivers based on otolith

microchemistry. Incidental catches and observations of juvenile steelhead have occurred on the Tuolumne and Merced rivers, indicating that steelhead are widespread throughout accessible streams and rivers in the Central Valley (Good *et al.* 2005).

Monitoring data for adult and juvenile Central California Coast steelhead from South Bay tributaries is extremely limited. Based on the available information steelhead abundance in South Bay tributaries is currently very low.

Life History and Habitat Requirements

Steelhead can be divided into two life history types, based on their state of sexual maturity at the time of river entry and the duration of their spawning migration, stream-maturing and ocean-maturing. Stream-maturing steelhead enter freshwater in a sexually immature condition and require several months to mature and spawn, whereas ocean-maturing steelhead enter freshwater with well-developed gonads and spawn shortly after river entry (NMFS 2009). These two life history types are more commonly referred to by their season of freshwater entry (*i.e.,* summer [stream-maturing] and winter [ocean-maturing] steelhead). Steelhead within the Action Area are considered to be winter-run steelhead (ocean-maturing), based on their state of sexual maturity at the time of river entry and the duration of their spawning migration. Central Valley steelhead generally spawn in small streams where cool, well-oxygenated water is available year-round (Hallock *et al.* 1961). Upstream migration can extend all year; however, most fish migrate from December through March. The Bay-Delta serves as a migration corridor for immigrating adult steelhead and emigrating juvenile steelhead. The Bay-Delta tributaries support juvenile steelhead rearing prior to emigration to the Pacific Ocean.

Winter steelhead generally leave the ocean from August through April, and spawn between December and May (Busby *et al.* 1996). Timing of upstream migration is correlated with higher flow events, such as freshets, and associated lower water temperatures. Typically, adult steelhead moving into the Sacramento River Basin begin to enter the Bay-Delta during mid- to late-summer, and subsequently enter the Sacramento River system from July to early September. Kelts, post-spawning adults, are typically seen later in the spring following spawning. Adult steelhead entering the San Joaquin River Basin appear to have a later spawning run than Sacramento River Basin steelhead, entering the basin in late October through December, indicating presence in the Delta beginning a few weeks earlier (NMFS 2009). Adult steelhead tend to migrate into South Bay tributaries during the winter months in response to increased freshwater flows associated with storms.

Unlike Pacific salmon, steelhead are capable of spawning more than once before death (Busby *et al.* 1996). However, it is rare for steelhead to spawn more than twice before dying; most that do so are females (Nickelson *et al.* 1992, Busby *et al.* 1996). Most steelhead spawning takes place from late December through April, with peaks from January through March (Hallock *et al.* 1961). Steelhead spawn in cool, clear streams featuring suitable gravel size, depth, and current velocity, and may spawn in intermittent streams as well (Everest 1973, Barnhart 1986).

The length of the incubation period for steelhead eggs is dependent on water temperature, dissolved oxygen (DO) concentration, and substrate composition. In late spring and following yolk sac absorption, fry emerge from the gravel and actively begin feeding in shallow water along stream banks (Nickelson *et al.* 1992).

Steelhead rearing during the summer takes place primarily in higher velocity areas in pools although young-of-the-year also are abundant in glides and riffles. Winter rearing occurs more uniformly at lower densities across a wide range of fast and slow habitat types. Productive rearing steelhead habitat is characterized

by complexity, primarily in the form of large and small woody debris. Cover is an important habitat component for juvenile steelhead both as velocity refugia and as a means of avoiding predation (Shirvell 1990, Meehan and Bjornn 1991). Some older juveniles move downstream to rear in large tributaries and mainstem rivers (Nickelson *et al.* 1992). Juveniles feed on a wide variety of aquatic and terrestrial insects (Chapman and Bjornn 1969), and older juveniles sometimes prey upon emerging fry.

Steelhead generally spend one to two years in freshwater before emigrating downstream. During rearing, suspended and deposited fine sediments can directly affect salmonids by abrading and clogging gills, and indirectly cause reduced feeding, avoidance reactions, destruction of food supplies, reduced egg and alevin survival, and changed rearing habitat.

Juvenile steelhead emigrate episodically from natal streams during fall, winter, and spring high flows. Based on SWP and CVP fish facility salvage data, most juvenile steelhead move through the Bay-Delta from November through June, with the peak salvage occurring during February, March, and April (Reclamation 2008). Juvenile steelhead have been collected in the Chipps Island trawls from October through July (NMFS 2009).

Emigrating Central Valley steelhead use the lower reaches of the Sacramento River and the Bay-Delta for rearing and as a migration corridor to the ocean. Some may utilize tidal marsh areas, non-tidal freshwater marshes, and other shallow water areas in the Bay-Delta as rearing areas for short periods prior to their final emigration to the sea. Barnhart (1986) reported that steelhead smolts in California range in size from 140 to 210 mm (fork length). Hallock *et al.* (1961) found that juvenile steelhead in the Sacramento River basin migrate downstream during most months of the year, but the peak period of emigration occurred in the spring, with a much smaller peak in the fall. Juvenile steelhead rearing and migration through the South Bay is largely unknown.

Hatchery-produced steelhead juveniles typically occur at Chipps Island from January through March, with a peak occurrence during February and March. The difference in the timing of emigration between wild and hatchery-reared steelhead smolts is largely due to the timing of hatchery releases. Based on the small numbers of emigrating steelhead that are captured in the lower Sacramento River, it appears that most hatchery steelhead smolts pass Knights Landing soon after they are released from Coleman Hatchery in January, and pass rapidly through the Delta to Chipps Island, although some linger for several months. Naturally produced fish mainly pass Knights Landing in April and May (Williams 2006). No hatchery produced steelhead have been released into South Bay tributaries in recent years.

Factors Affecting Abundance

One of the primary factors that has affected population abundance of Central Valley steelhead has been the loss of access to historic spawning and juvenile rearing habitat within the upper reaches of the Sacramento River and its tributaries and San Joaquin River as a result of the migration barriers caused by construction of major dams and reservoirs. Operation of the Red Bluff Diversion Dam, which impeded adult upstream migration and increased the vulnerability of juvenile steelhead to predation mortality, has been identified as a factor affecting mortality within the river. A new water diversion and positive barrier fish screen has recently been constructed to allow the Red Bluff Diversion Dam gates to remain open during most of the year, thereby improving migration conditions for juvenile and adult steelhead and other migratory fish. Dams and water diversions have also limited the geographic distribution of steelhead in many South Bay tributaries.

Water temperatures within the rivers and creeks have also been identified as a factor affecting incubating eggs, holding adults, and growth and survival of juvenile steelhead. Juvenile steelhead are also vulnerable to entrainment at a large number of unscreened water diversions located along the Sacramento River and within the Delta in addition to entrainment and salvage mortality at the SWP and CVP export facilities. Changes in habitat quality and availability for spawning and juvenile rearing, exposure to contaminants, hybridization with hatchery-produced steelhead, predation mortality by Sacramento pikeminnow, striped bass, and other predators, and competition and interactions with hatchery-produced Chinook salmon and steelhead have all been identified as factors affecting steelhead abundance. In addition, subadult and adult steelhead are vulnerable to recreational fishing in the rivers, ocean survival is affected by climatic and oceanographic conditions, and adults are vulnerable to predation mortality by marine mammals.

In recent years, a number of changes have been made to improve the survival and habitat conditions for steelhead. Several large previously unscreened water diversions have been equipped with positive barrier fish screens. Modifications to SWP and CVP export operations have also been made to improve the survival of juvenile steelhead. Improvements in fish passage facilities have also been made to improve migration and access to upstream habitat such as construction of the fish ladders in Alameda Creek.

Presence in South San Francisco Bay

The majority of steelhead migrate upstream within the mainstem Sacramento River, after passing upstream through the Central Bay and Suisun Bay. The occurrence of adult steelhead within areas adjacent to Alameda Creek would be limited to the late winter and spring period (primarily March-May) of adult upstream migration and juvenile downstream migration. Since South San Francisco Bay is not part of the adult migration route the likelihood of adult Central Valley steelhead in the Action Area is low. Central California Coast steelhead migrate through the South Bay and therefore may migrate through the Action Area, although no information is available on adult migration routes through the South Bay.

Juvenile steelhead migrate from the Sacramento River, including its tributaries and other Central Valley rivers and streams, into the Delta and Suisun and Central bays during their downstream migration and also use the Bay-Delta as a foraging area and migration pathway during the winter and early spring migration period. The occurrence of juvenile steelhead in San Francisco Bay would be expected during late fall through spring (October-June), when water temperatures within the Bay-Delta would be suitable for juvenile steelhead migration. Since South San Francisco Bay is not part of the juvenile migration route the likelihood of juvenile Central Valley steelhead in the Action Area is low. Central California Coast steelhead migrate through the South Bay before entering coastal marine waters and therefore may migrate through the Action Area, although no information is available on juvenile migration routes through the South Bay.

Since steelhead do not spawn within the South Bay there is no probability that the proposed Project would adversely affect steelhead spawning, egg incubation, or juvenile rearing stages.

Existing Conditions in the Project Site

Steelhead are known to spawn and rear in tributaries to South San Francisco Bay (e.g., Coyote Creek, Guadalupe River, etc.) and migrate through the South Bay during passage to and from coastal marine waters. Adult steelhead have been observed in the Alameda Creek flood control channel but access to upstream spawning and rearing habitats is completely blocked by the BART Weir which is a total fish passage barrier. Efforts are currently underway to construct fish

ladders to allow steelhead access to upper reaches of the creek. The tide gate located in Ardenwood Creek would also block adult steelhead from migrating into the creek. Habitat conditions (e.g., spawning substrate and seasonal water temperatures as well as blocked access by the tide gate) result in unsuitable habitat for steelhead within Ardenwood Creek. Steelhead migrate primarily during the winter and early spring and a BMP has been included in the proposed Project restricting channel dredging and construction within Ardenwood Creek to the seasonal work window extending from June 1 to October 15 to further avoid potential impacts during the migration period (November 1 to May 31). With this avoidance measure, in combination with blocked access and unsuitable habitat conditions, effects of the proposed Projection both adult and juvenile steelhead are expected to be less than significant.

Southern Distinct Population Segment of North American Green Sturgeon

Status

The North American green sturgeon has been separated into two DPSs: (1) the Northern DPS (all populations north of and including the Eel River); and (2) the Southern DPS (coastal and Central Valley populations south of the Eel River, which includes the proposed Project Action Area). Green sturgeon in the Southern DPS are listed as threatened under the Federal ESA but are not listed under CESA. NMFS completed a final recovery plan for the Southern DPS of North American green sturgeon in 2018. NMFS has designated critical habitat for green sturgeon, which includes the South Bay and the areas adjacent to the Alameda Creek estuary.

Historic and current green sturgeon spawning occurs in the upper Sacramento River (Adams *et al.* 2002, Beamesderfer *et al.* 2004). Currently, upstream migrations of sturgeon are halted by Keswick Dam on the mainstem of the Sacramento River. Spawning on the Feather River is suspected to have occurred in the past due to the continued presence of adult green sturgeon in the river below Oroville Dam. Spawning in the San Joaquin River system has not been recorded historically or observed recently. Spawning by green sturgeon in South Bay tributaries including Alameda Creek has not been reported and is unlikely given the small size and shallow depth of these tributaries.
The size of the population of green sturgeon is difficult to estimate due to a lack of data specific for this fish. Entrainment numbers at the SWP and CVP pumping facilities in the South Delta provide a relative indicator of abundance of juvenile green sturgeon and have been consistently lower than their levels in the mid-1970s (SWP) and the mid-1980s (CVP). Prior to 1986, the SWP (1968 -2001) averaged 732 green sturgeons salvaged per year, which dropped to 47 per year after 1986. The CVP (1980-2001) showed similar declines in its salvage rate for green sturgeon, 889 per year prior to 1986 and 32 per year after 1986.

Limited information about population abundance for the Southern DPS of North American green sturgeon comes from incidental captures by a CDFW sturgeon tagging program to monitor white sturgeon (NMFS 2009). CDFW (2002) estimated that green sturgeon abundance ranged from 175 to more than 8,000 adults between 1954 and 2001 with an annual average of 1,509 adults; however, CDFW does not consider these estimates reliable. Over the last two decades, the green sturgeon population in the Sacramento River is believed to have declined, with less than 50 spawning green sturgeon being sighted annually in the best spawning habitat along the middle section of the Sacramento River (NMFS 2009). No estimates of green sturgeon abundance have been made for South San Francisco Bay.

Life History and Habitat Requirements

As anadromous fish, green sturgeon rely on riverine, estuarine, and marine habitats. Freshwater habitat of green sturgeon of the Southern DPS varies in function, depending on location in the Sacramento River. Spawning areas currently are limited to accessible reaches of the Sacramento River upstream of Hamilton City and downstream of Keswick Dam (CDFW 2002). Green sturgeon prefer low gradient reaches or off-channel sloughs and coves with large cobble, deep and cool pools, and turbulent flows (CDFW 2002; Moyle 2002).

There is relatively little known about green sturgeon migratory requirements of adults and juveniles, particularly for those that spawn in the Sacramento River. Adult green sturgeon begin their upstream spawning migration into the San Francisco Bay in March, migrate upstream primarily along the western edge of the Delta into the lower Sacramento River and reach Knights Landing during the spring and early summer. Spawning occurs between March and July when temperatures are between 45° and 57°F (Reclamation 2008). Peak spawning is believed to occur between April and June. Green sturgeon spawn upstream of Hamilton City, and possibly to Keswick (CDFW 2002). After spawning in the Sacramento River, adult green sturgeon move downstream into holding habitats in the lower river or further into the Delta, returning through the San Francisco Bay to the ocean during late fall or winter. During flood years, the Yolo Bypass serves as an important migration corridor for Southern DPS adults on their upstream and downstream migrations to and from the Sacramento River (NMFS 2009). Although feeding by green sturgeon within the bypass has not been documented, the bypass provides a high macroinvertebrate forage base that may support feeding.

Eggs hatch in about 8 days at 55°F (Reclamation 2008). Newly hatched green sturgeon are strongly oriented to the river bottom and exhibit nocturnal activity patterns. After six days, larvae begin their nocturnal downstream migration movements. Young green sturgeon appear to rear for the first one to two months in the Sacramento River between Keswick Dam and Hamilton City (CDFW 2002). Two-week-old green sturgeon have been captured at RBDD, and three-week-old green sturgeon have been captured further downstream at the Glen Colusa Irrigation District (GCID) facility. Green sturgeon larvae and post larvae are present in the North Delta (and lower Sacramento River) between May and October, primarily in June and July (CDFW 2002).
Juveniles spend one to two years in freshwater before migrating into the ocean (Nakamoto *et al.* 1995), leaving the Sacramento River prior to September. Juvenile green sturgeon have been observed in the Bay-Delta through the San Francisco Bay including Rio Vista to Chipps Island, Sacramento Deepwater Ship Channel, Montezuma Slough, and Suisun Bay, during all months of the year. Juveniles have also been observed during the summer in shallow shoals 3.3 to 9.8 feet deep (water depth) in the lower San Joaquin River, and year-round in the South Delta at the SWP and CVP fish facilities (CDFW 2002).

Juveniles use the Bay-Delta areas to forage and rear until they gain the osmoregulatory capacity to tolerate higher salinity concentrations. Stomach contents from adult and juvenile green sturgeon captured in the Delta and San Pablo and Suisun bays point to the importance of habitat that supports shrimp, mollusks, isopods, clams, annelid worms, amphipods, unidentified crabs, and small fish (Reclamation 2008).

Suitable water temperatures for juvenile green sturgeon are reportedly below about 75°F (24°C). Suitable salinity levels range from freshwater (less than 3 parts per thousand [ppt]) for larvae and early juveniles in upstream riverine habitats to brackish water and full-strength saltwater (33 ppt) for juvenile, subadult, and adult green sturgeon (including Suisun, San Pablo and Central San Francisco bays).

Factors Affecting Abundance

Juvenile green sturgeon are vulnerable to entrainment at water diversions and water control structures within the Bay-Delta. Juvenile and adult green sturgeon may be trapped behind the barriers, preventing movement particularly during their installation and operation, but are removed from the channels each winter. The Delta Cross-Channel (DCC) is an additional flow operation related barrier to juvenile and adult migration. Other potential migration barriers include the Sutter Bypass and the Fremont Weir. The Fremont Weir is at the upstream end of Yolo Bypass. Green sturgeon enter the Yolo Bypass while it is inundated with floodwaters. When floodwaters recede, the green sturgeon become trapped behind the Fremont Weir, which impedes upstream migration. Trapped sturgeon are susceptible to heavy fishing pressure (legal and illegal).

Juvenile green sturgeon may be vulnerable to unscreened agricultural diversions within the Sacramento River and Delta, although most of the over 2,000 diversions are considered to be too small to pose a risk to juvenile and larger sturgeon (Reclamation 2008). There is no evidence to indicate that sturgeon are entrained by the operations of the Contra Costa Canal (CCC) (Reclamation 2008). Juvenile green sturgeon are entrained regularly at the CVP and SWP salvage facilities. Subadult and adult green sturgeon are also known to be entrained at the CVP and SWP pumping facilities in the Delta. Adult-sized sturgeon have been collected from the SWP Clifton Court Forebay.
Green sturgeon forage on benthic macroinvertebrates, shrimp, and other prey in close proximity to the bottom. Historical reclamation of wetlands and islands as well as channelization has reduced and degraded suitable in- and off-channel rearing habitat for green sturgeon. Channelization in the Delta has reduced the amount of subtidal and intertidal habitat used for foraging by juvenile, subadult and adult green sturgeon. These habitats are considered important for growth during the juvenile, coastal migrant, and adult life stages. Further, the channelization and hardening of levees with the use of riprap has reduced in- and off-channel intertidal and subtidal rearing habitat as well as seasonal inundation of floodplains. The resulting changes to river hydraulics, riparian cover, and geomorphology affect important ecosystem functions. Due to juvenile and adult green sturgeon feeding primarily on benthic organisms such as clams and shrimp, habitat related impacts of reclamation, channelization, and riprapping are expected to contribute to reductions in food source availability and altered predator abundance. The impacts of channelization and riprapping are thought to affect all life stages of green sturgeon, as they are all dependent on the freshwater and estuarine food webs within the rivers and the Bay-Delta.

Contamination of the Sacramento River has increased since the 1970s due to the application of rice pesticides and other contaminants for agricultural uses as well as the discharge of a number of point- and non-point source contaminants associated with municipal and industrial development, agriculture, and natural sources (USFWS 1996). Studies on white sturgeon in estuaries indicate that the bioaccumulation of pesticides and other contaminants adversely affects growth and reproductive development and may result in decreased reproductive success (Fairey et al. 1997; Foster et al. 2001a; Foster et al. 2001b; Kruse and Scarnecchia, 2002; Feist et al., 2005; Greenfield et al. 2005, all as cited in 73 FR 52084). Green sturgeon are believed to experience similar effects from contaminants (70 FR 17386: 73 FR 52084). Toxicants found in the Delta and throughout the watershed, including methylmercury, endocrine disruptors, and pyrethroids are also known to affect juvenile green sturgeon. While other toxicants persist in the San Francisco Bay-Delta, the near- and long-term independent and synergistic effects of these chemicals on green sturgeon are unknown.

Green sturgeon are long-lived (60 to 70+ years) fish that make repeated spawning migrations through the Bay-Delta. They continually ingest contaminated forage prey, especially benthic filter feeders, and are exposed to contaminants in the water column during spawning migrations. As a result, they can suffer from bioaccumulation of contaminants that originate from urban stormwater runoff (which may contain petroleum products, heavy metals, and various organic

solvents), agricultural derived runoff (i.e., pesticides, herbicides, fertilizers, and animal wastes), and wastewater treatment plants (metals, pharmaceuticals, personal care products, organic compounds). Green sturgeon growth, fecundity, and egg size are likely negatively affected by contaminants found within the Bay-Delta like selenium and mercury (Linville 2006). Selenium can also cause larvae to have increased skeletal deformities and cause mortality associated with maternal bioaccumulation.

Exposure to seasonally elevated water temperatures in the Delta and throughout the watershed has been identified as a factor affecting habitat quality for various life stages of green sturgeon. Water temperatures above about 68° F (20° C) are reportedly lethal to green sturgeon embryos, and temperatures below about 52° F (11° C) or above about 66° F (19° C) reportedly lead to reduced growth (Cech et al. 2000 as cited in Adams et al. 2002). It is possible that low levels of dissolved oxygen (DO) in the subtidal and intertidal Delta habitats and the Deep-Water Ship Channel can cause chronic stress in young green sturgeon (Lankford et al. 2003).

Invasive species have affected green sturgeon through changes in the Delta food web and ultimately their diet. Increased availability of new (non-native) benthic species (e.g., Asian Overbite Clam) has increased foraging opportunities. One consequence has been an increase in bioaccumulation of contaminants. The Overbite Clam, due to its high filtration efficiency, accumulates selenium in high concentrations and loses it slowly (Luoma and Presser 2000). Dietary selenium in high concentrations could adversely affect green sturgeon survival, activity and growth.

Non-native fish such as striped bass, largemouth and smallmouth bass, and centrarchids may prey upon juvenile green sturgeon. No quantitative data are available, however, on the magnitude of the contribution of predation mortality on the population dynamics of green sturgeon.
Green sturgeon can be caught incidentally by recreational anglers targeting white sturgeon, potentially resulting in hooking mortality. Illegal harvest of green sturgeon is known to occur in the Sacramento River, particularly in areas where sturgeon have become concentrated, as well as throughout the Bay-Delta. Currently, there are no hatchery operations for green sturgeon.

Presence of Green Sturgeon in South San Francisco Bay

Although the Sacramento River watershed is the identified migration route and spawning area for green sturgeon, both adult and juvenile green sturgeon are known to occur within San Francisco Bay. Juveniles have been captured in the vicinity of Santa Clara Shoals, Brannan Island State Recreational Area and in the channels of the South Delta (Moyle et al. 1992, Beamesderfer et al. 2004). Both adult and juvenile green sturgeon may use the Bay-Delta as a migratory, resting, or rearing habitat. Occurrence in the South Bay could occur in any month, as juveniles may reside there during their first few years of growth. Adults are likely to be present in the winter and early spring as they move through the Bay-Delta towards their spawning grounds in the upper Sacramento River watershed. Following spawning, the fish would pass through the Bay-Delta again on their way back to the ocean, but the duration and timing of this event is not well understood in the Sacramento River system. Since South San Francisco Bay is not part of the adult migration route the likelihood of adult green sturgeon in the Action Area is low, although adult and juvenile sturgeon may use the South Bay and the Alameda Creek estuary for foraging and therefore could be in the proposed Project Action Area. South San Francisco Bay has been designated by NMFS as critical habitat for green sturgeon.

Existing Conditions in the Project Site

North American green sturgeon are known to reside and use the San Francisco Bay as juvenile, subadult, and adult rearing habitat as well as a migratory corridor to upstream spawning areas in the mainstem Sacramento River and for passage of juveniles, subadult, and adult sturgeon to coastal marine waters. Subtidal habitat in the South Bay may provide sturgeon migratory pathways between the South Bay and Central Bay and therefore there is a low probability that green sturgeon would occur in the Project Action Area and potentially be temporarily exposed to construction related effects. Green sturgeon would not be able to access Ardenwood Creek as a result of the existing tidal gates and unsuitable habitat conditions within the creek for sturgeon spawning and juvenile rearing. Green sturgeon could rear downstream within the tidal estuary of lower Alameda Creek as well as near-shore waters of South San Francisco Bay and potentially be exposed to elevated turbidity or chemical spills, if they were to occur during proposed Project dredging and construction.

Longfin Smelt

Status

Longfin smelt have been listed as a threatened species under the CESA.

Life History

The longfin smelt is a small, slender-bodied fish that measures about 3 inches in length as an adult. The species generally lives for 2 years although some individuals may live to spawn at age 3. Populations of longfin smelt occur along the Pacific Coast of North America, from Hinchinbrook Island, Prince William Sound, Alaska to the San Francisco estuary (Lee *et al.* 1980). Although individual longfin smelt have been caught in Monterey Bay (Moyle 2002), there is no evidence of a spawning population south of the Golden Gate. The Bay-Delta population is the southernmost, and also the largest, spawning population in California. Small and perhaps ephemeral longfin smelt spawning populations have been documented or suspected to exist in Humboldt Bay, the Eel River estuary, the Klamath River estuary, and the Russian River (Moyle 2002).

Pre-spawning adult longfin smelt migrate upstream into the lower reaches of the rivers during the late fall and winter. Longfin smelt have adhesive eggs which are deposited on sand, gravel, rocks, submerged aquatic vegetation, and other hard substrates during spawning. Spawning occurs during the late winter and early spring. Longfin smelt have planktonic larvae that are transported downstream primarily into the western Delta and Suisun Bay during the late winter and spring where juveniles rear. Larval and juvenile longfin smelt have also been collected in the lower Napa and Petaluma rivers, Coyote Creek, and in the South Bay salt pond restoration areas and surrounding habitat. Longfin smelt have a two-year lifecycle. Longfin smelt reside as juveniles and pre-spawning adults in more saline habitat within San Pablo and San Francisco Bays during a majority of their life. Movement patterns based on catches in CDFW fishery sampling suggest that longfin smelt actively avoid water temperatures greater than 22° C (72° F).

These conditions occur within the Delta during the summer and early fall, when longfin smelt inhabit more marine waters further downstream in the bays and are not present within the Delta.
Juvenile and subadult longfin smelt predominantly inhabit brackish water areas of the San Francisco Bay estuary (San Pablo and San Francisco Bays) and nearshore coastal marine waters outside of the Golden Gate (Baxter *et al.* 1999, Rosenfield and Baxter 2007). Adult longfin smelt return to spawn in the

freshwater regions of the lower Sacramento River, near or downstream of Rio Vista, and the lower San Joaquin River downstream of Medford Island although limited spawning also occurs in other areas of the estuary. Historically, spawning longfin smelt were also common in Suisun Marsh; in recent years, very few adults, spawning-age longfin smelt have been collected in Suisun Marsh (UCD, unpubl. data). Collection of small longfins smelt larvae in the 20 mm surveys suggests spawning also occurs in the Napa River.

During January and February pre-spawning adult longfin smelt migrate upstream and stage in the lower reaches of the Sacramento and San Joaquin rivers. During the winter months the female continues to develop eggs in preparation for spawning. Spawning begins to take place in mid- to late February. The actual seasonal timing of spawning appears to vary among years in response to factors such as seasonal water temperatures. Water temperature is also expected to have an influence on the duration of egg incubation and subsequent timing of hatching and larval growth.
Upon hatching from adhesive eggs (primarily February-April), buoyant longfin smelt larvae rise toward the surface and are transported downstream by surface currents resulting from both river flow and tidal mixing of fresh and marine waters. Flow rates are positively related to downstream transport of the planktonic larvae (Baxter *et al.* 1999). Larval longfin smelt remain in the upper part of the water column until they reach 10-15 mm, after which they move to the middle and bottom parts of the water column (Bennett *et al.* 2002, Moyle 2002). Based on results of CDFW larval smelt and 20mm fishery sampling, larval longfin smelt less than 10-15 mm in length inhabit the Delta, lower river reaches, and Suisun Bay during the period from approximately late February through March depending on factors such as seasonal water temperatures that affect the timing of spawning and rate of egg incubation and larval growth. Based on the results of larval smelt and 20 mm surveys, which start in early March each year, it is expected that larval smelt are absent or rare during January and that eggs begin to hatch in late February with early larvae (approximately 5-10 mm in length) present in greater numbers starting in March and continuing through the spring months.

Larval and early juvenile longfin smelt typically inhabit areas within the lower Sacramento River (e.g., Cache Slough region), the central and western Delta, and Suisun Bay. Larval longfin smelt are typically collected in the region of the estuary extending from the western Delta into San Pablo Bay, but their distribution shifts upstream or downstream in response to Delta outflow (Baxter *et al.* 1999). In years when winter-spring Delta outflow is low, fewer larvae are transported to San Pablo Bay. After absorbing the yolk-sac the larvae begin to forage on small zooplankton. Based on results of 20 mm fishery surveys the larval longfin smelt appear to be distributed within the lower Sacramento River (including Cache Slough), the western Delta, Suisun Bay, and in higher flow years San Pablo Bay. In years when winter-spring Delta outflow is high, few larvae remain in the western Delta, but are abundant in San Pablo Bay and may reach northern San Francisco Bay (Baxter *et al.* 1999). Although the early larval life stage of longfin smelt is thought to successfully forage and rear over a range of habitats within the estuary, correlations between Delta outflow during the late winter and spring (February-May) when longfin smelt larvae are transported and dispersed into downstream rearing areas have shown higher population abundance in the fall during those years when winter and spring outflow was higher. Although the causal mechanism underlying the correlation between winter-spring Delta outflow and longfin smelt abundance is unknown, it has been hypothesized that higher flows contribute to more rapid downstream transport of planktonic larvae (moving larvae into areas of the estuary where zooplankton densities are greater and therefore better rearing conditions) as well as transporting more phytoplankton and nutrients downstream into the low and moderate salinity regions of the estuary in Suisun and San Pablo Bays. During the period starting in approximately early March longfin smelt larvae are distributed within open water estuarine habitats. The initial distribution of young juveniles correlates positively with that of larvae, both vertically within the water column and geographically.

During their first year, juvenile longfin smelt disperse downstream into brackish and marine regions of the estuary, eventually inhabiting Suisun, San Pablo, and Central and South San Francisco bays and moving into nearshore coastal marine habitats in most years (Baxter *et al.* 1999; Moyle 2002). Late larval and juvenile longfin smelt migrate downstream from the Suisun Bay rearing habitat into the more saline regions of the estuary in late spring. Collections of larval and juvenile longfin smelt less than 50 mm fork length (FL) within the Bay-Delta showed that 90% of the individuals inhabited areas with salinities ≤18 parts per thousand (ppt; Baxter *et al.* 1999). Salinities of 18 ppt are typical of conditions occurring in San Pablo Bay in most years. Salinity in Suisun Bay during the spring in most years is generally within the range from 1 to 5 ppt.

Healthy individuals 20 mm FL and larger have been captured in salinities of 32 ppt (marine water) and along the open coast, demonstrating the high salinity tolerance of longfin smelt. The effect of turbidity (i.e., low water clarity and visibility) on longfin smelt geographic distribution or habitat preferences is unknown. However, longfin smelt larvae hatch coincident with annual peak Delta outflows, which typically coincide with high turbidity. Also, larval and older life stages of longfin smelt possess a well-developed olfactory system, which suggests its use in food acquisition (Scott Foott, pers. comm.).

Factors Affecting Abundance

A variety of factors are thought to influence the abundance and year class strength of longfin smelt. These factors include seasonal hydrologic conditions (Delta outflow) during the late winter and spring, colonization of Suisun Bay and the western Delta by the Asian overbite clam (*Corbula amurensis*) in the mid-1980s, exposure to toxics, predation and competition with non-native species, and sources of direct mortality such as entrainment into the many (estimated to be over 1,800) unscreened water diversions located within the Delta. One of the causal mechanisms potentially contributing to the decline in longfin smelt and other pelagic species inhabiting the estuary is reduced food supplies (i.e., reductions in the abundance of suitable zooplankton), which are caused by foraging on zooplankton by non-native species, such as the overbite clam, and reductions in phytoplankton abundance due to increased concentrations of ammonia or other factors in the Delta. Longfin smelt abundance has also been potentially impacted by changes in coastal upwelling(i.e., cold ocean water with high nutrients mixing with surface waters) and production of phytoplankton and zooplankton in coastal marine waters. Statistical analyses show strong and statistically significant correlations between indices of longfin smelt abundance, based on results of the fall mid-water trawl surveys, and (a) the magnitude of freshwater flowing into and out of the Delta during the late winter and spring which, in turn, influences the location of the low salinity region within the estuary (referred to as the X2 location in km upstream from the Golden Gate Bridge), (b) winter-spring (February-April) air temperature at Davis, and (c) ammonia concentrations observed in the Sacramento River at Hood/Greens Landing during March and September of the previous year. It is also notable that increased Delta outflow is not always a strong indicator of longfin smelt abundance. As just one example, although Delta outflow conditions improved (i.e., outflow increased) in 2003, longfin smelt abundance did not increase (as would be expected based on the outflow-abundance relationship). This finding suggests that an additional factor or factors besides freshwater outflow, such as air temperature, food supplies, or ammonia concentrations, may now be limiting the Bay-Delta population abundance of longfin.
Results of fishery sampling conducted by CDFW, such as the fall mid-water trawl surveys show that longfin smelt indices of abundance have declined substantially. Longfin smelt are considered to be a “pelagic” species – meaning they inhabit the open water areas of the Bay-Delta estuary where they forage on zooplankton throughout their juvenile and adult life stages. Results of fishery surveys have documented a substantial decline in the abundance of a variety of pelagic species, including longfin since 2000, which is referred to as the pelagic organism decline (POD). The causes of decline are likely multiple and synergistic (Baxter *et al.* 2008), including:

- Reduction in Delta outflows during the late winter and spring.
- Entrainment losses to water diversions.
- Reduced spawning and rearing habitat.
- Reduced food (prey) availability thought to be the result of reduced primary production due, in part, to a reduction in seasonally inundated wetlands, competition for food resources with non-native fish and macroinvertebrates (e.g., filter feeding by the non-native Asian overbite clam *Corbula*), and competition among native and non-native zooplankton species.
- Climatic variation.
- Exposure to toxic substances, however there is no known direct link between chemical concentrations in estuarine waters and larval mortality; and
- Predation and competition with introduced species.

A number of investigations are currently underway to provide information on the factors that contribute to the POD (Baxter *et al.* 2008, SWC unpub. Workshop 2019).

Presence in the South Bay

Longfin smelt spawn adhesive eggs in shallow areas adjacent to the lower Sacramento River during the late winter and early spring and may also spawn in shallow areas adjacent to Suisun Bay and other Bay-Delta tributaries. Longfin smelt eggs would not be present in the South Bay as a result of elevated salinity.

Larval and early juvenile longfin smelt are present in Suisun Bay during the late winter and spring. Larval and early juvenile longfin smelt inhabit Suisun Bay and the Delta and are not known to inhabit South San Francisco Bay. Juvenile and adult longfin smelt migrate downstream and inhabit San Francisco Bay and near-shore coastal marine waters and may be present year-round.

Existing Conditions in the Project Site

As a result of elevated salinities longfin smelt eggs and larvae are not expected to occur in the proposed Project Area. Juvenile and adult longfin smelt have been collected in CDFW fishery surveys from throughout the South Bay and therefore are assumed to also occur in the vicinity of the Alameda Creek estuary. Although systematic fishery survey data are not available from the Project site it has been assumed for purposes of this assessment of proposed Project construction effects that juvenile and adult longfin smelt may be present at the Project site. Longfin smelt adults would not have access to migrate into Ardenwood Creek as a result of the existing tidal gates and have not been reported from fishery surveys of Alameda Creek. Juvenile and adult longfin smelt could, however, potentially be present in the estuary and near-shore waters of South San Francisco Bay and be exposed to elevated turbidity or chemical spills, if they were to occur, during Ardenwood Creek dredging or construction.

Critical Habitat

Critical habitat has been designated by NMFS for winter-run and spring-run Chinook salmon, Central Valley and Central California Coast steelhead, and green sturgeon. South San Francisco Bay is not part of the designated critical habitat for winter-run or spring-run Chinook salmon or Central Valley steelhead. South San Francisco Bay is included as designated critical habitat for Central California Coast steelhead and green sturgeon. Critical habitat has not been designated for longfin smelt.

Essential Fish Habitat

The Action Area includes the Alameda Creek estuary and immediately adjacent areas of South San Francisco Bay which potentially serve as Essential Fish Habitat (EFH)for pelagic, groundfish, and salmon species covered by the Coastal Pelagic Fish Management Plan (FMP), the Pacific Groundfish FMP, and the Pacific Coast Salmon FMP developed by the Pacific Fishery Management Council under the requirements of the Magnuson-Stevens Act. Table XX lists those fish species covered by these plans identified as utilizing San Francisco Bay and potentially occurring in the Action Area, along with the life stage and relative occurrence as determined from CDFW unpublished Bay Study midwater trawl and otter trawl fishery surveys. Given the lack of specific data on the occurrence of EFH listed fish species in the Action Area the EFH analyses used data from the broader South San Francisco Bay with the assumption that if the species occurs in the South Bay there is the potential for occurrence in the Project Action Area including the Alameda Creek estuary.

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended (16 U.S.C. 1801 *et seq.*), requires that Essential Fish Habitat be identified and described in Federal fishery management plans (FMPs). Federal action agencies must consult with NMFS on any activity which they fund, permit, or carry out that may adversely affect EFH. NMFS is required to provide EFH conservation and enhancement recommendations to the Federal action agencies.

Table 2. Managed Fish Species under the Magnuson-Stevens Act in the Oakland Estuary and South Bay

Fisheries Management Plan	Species, Common Name	Species, Scientific Name	Life Stage*	South Bay/Oakland Estuary
Coastal Pelagic	Northern anchovy	*Engraulis mordax*	J, A	Abundant
	Jack mackerel	*Trachurus symmetricus*	E,L	Present
	Pacific sardine	*Sardinops sagax*	J, A	Present
Pacific Groundfish	English sole	*Parophrys vetulus*	J, A	Abundant
	Sand sole	*Psettichthys melanostictus*	L, J, A	Present
	Curlfin sole	*Pleuronichthys decurrens*	J	Rare
	Pacific sanddab	*Citharichthys sordidus*	E, L, J, A	Present
	Starry flounder	*Platichthys stellatus*	J, A	Present
	Lingcod	*Ophiodon elongates*	J, A	Present
	Brown rockfish	*Sebastes auriculatus*	J	Present
	Pacific whiting (hake)	*Merluccius productus*	E,L	Present
	Kelp greenling	*Hexagrammos decagrammus*	J, A	Present
	Leopard shark	*Triakis semifasciata*	J, A	Present
	Spiny dogfish	*Squalus acanthias*	J, A	Present
	Skates	*Raja* ssp.	J, A	Present
	Soupfin shark	*Galeorhinus galeus*	J, A	Rare
	Bocaccio	*Sebastes paucispinis*	J	Rare
	Cabezon	*Scorpaenichthys marmoratus*	J	Present
Pacific Coast Salmon	Chinook salmon	*Oncorhynchus tshawytscha*	J, A	Seasonally Present
	Coho salmon	*Oncorhynchus kisutch*	J, A	Historically Present, Current Occurrence unknown

Table Information Sources: Pacific Fishery Management Council. 2011. Groundfish - http://www.pcouncil.org/groundfish/background/; Salmon- http://www.pcouncil.org/salmon/background/; Coastal Pelagic- http://www.pcouncil.org/coastal-pelagic-species/background-information/. Accessed April 20, 2011. CDFW Bay Study unpublished mid water trawl and otter trawl data 1980 – 2012.

NOTES: A = Adult; J = Juvenile; L = Larvae; E = Egg

EFH is defined as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity. The Project site is located within the South Bay region identified as EFH for Pacific salmon, Coastal Pelagic Fish, and Pacific Coast Groundfish.

The Pacific Fishery Management Council (PFMC) has identified and described EFH. Freshwater EFH for Pacific salmon in the California Central Valley includes waters currently or historically accessible to salmon within the Central Valley ecosystem as described in Myers *et al.* (1998) and includes not only the watersheds of the Sacramento and San Joaquin river basins but also the Delta, Suisun Bay and San Francisco Bay. Sacramento River winter-run, Central Valley spring-run, and Central Valley fall-/late fall-run Chinook salmon are species managed under the Pacific Salmon FMP that occur in the Central San Francisco Bay, the Delta, Suisun

Bay, and lower Sacramento River (only fall-run Chinook salmon are thought to occur in the South Bay Action Area). Factors limiting salmon populations in the Bay-Delta include periodic reversed flows due to high water exports (drawing juveniles into large diversion pumps), loss of fish into unscreened agricultural diversions, predation by introduced species, and reduction in the quality and quantity of rearing habitat due to channelization (e.g., riprapping), pollution, loss of access to upstream habitat and changes in instream flows and seasonal water temperature. Factors affecting salmon populations in San Francisco Bay include heavy industrialization within its watershed and discharge of wastewater effluents into the bay. Loss of vital wetland habitat along the fringes of the bay reduce rearing habitat and diminish the functional processes that wetlands provide for the bay ecosystem. Examples of the life history of three EFH fish species that inhabit San Francisco Bay are summarized below.

Pacific Salmon

General life history information for Central Valley Chinook salmon is summarized below.
Adult Central Valley fall-run Chinook salmon enter the Sacramento and San Joaquin rivers from July through December and spawn from October through December while adult Central Valley late fall-run Chinook salmon enter the Sacramento River from October to April and spawn from January to April. Only fall-run Chinook salmon are thought to occur in the South Bay and its tributaries such as Coyote Creek and the Guadalupe River. Chinook salmon spawning generally occurs in clean loose gravel in swift, relatively shallow riffles or along the edges of fast runs. Chinook salmon have not been observed in Alameda Creek fishery surveys and would not have access to suitable upstream spawning or rearing habitat as a result of the passage barriers associated with the BART Weir and tidal gates on Alameda and Ardenwood Creeks. Small numbers of Chinook salmon spawn in South Bay tributaries and therefore may potentially migrate past the Project site either as juveniles or adults. Juvenile Chinook salmon could potentially inhabit the Alameda Creek estuary as a non-natal rearing area during the spring outmigration period and juvenile and adult Chinook salmon could potentially migrate in near-shore waters adjacent to Alameda Creek. A BMP has been included in the Project to limit dredging and construction activity within Ardenwood Creek to the period from June 1 through October 15 which would avoid the potential presence of juvenile and adult Chinook salmon in the proposed Project area.

Starry Flounder

The starry flounder is a flatfish found throughout the eastern Pacific Ocean, from the Santa Ynez River in California to the Bering and Chukchi seas in Alaska, and eastwards to Bathurst inlet in Arctic Canada. Adults are found in marine and estuarine waters. Spawning takes place during the fall and winter months. The adults spawn in shallow coastal waters near river mouths and sloughs, and the juveniles are found almost exclusively in estuaries. The juveniles often migrate up freshwater rivers but are estuarine dependent. Eggs are broadcast spawned and the buoyant eggs drift with wind and tidal currents. Juveniles gradually settle to the bottom after undergoing metamorphosis from a pelagic larva to a demersal juvenile by the end of April. Juveniles feed mainly on small crustaceans, barnacle larvae, Cladocerans, clams and dipteran larvae. Juveniles are extremely dependent on the condition of the estuary for their health. Polluted estuaries and wetlands decrease the survival rate for juvenile starry flounder. Juvenile starry flounder also tend to accumulate many of the anthropogenic contaminants found in the environment. Ardenwood and Alameda Creeks would not provide suitable habitat for spawning by starry flounder but there is a potential for juvenile flounder to inhabit the estuary and near-shore waters of South San Francisco Bay.

English Sole

The English sole is a flatfish found from Mexico to Alaska. It is abundant in the San Francisco Bay estuary system. Adults are found in nearshore environments. English sole generally spawn during late fall to early spring at depths of 50 to 70 meters over soft mud bottoms. Eggs are initially buoyant, and then begin to sink just prior to hatching. Incubation may last only a few days to a week depending on temperature. Newly hatched larvae are bilaterally symmetrical and float near the surface. Wind and tidal currents carry the larvae into bays and estuaries, including the South Bay, where the larvae undergo metamorphosis into the demersal juvenile. The young depend heavily on the intertidal areas, estuaries, and shallow near-shore waters for food and shelter. Juvenile English sole primarily feed on small crustaceans (*i.e.,* copepods and amphipods) and on polychaetae worms in these rearing areas. Polluted estuaries and wetlands decrease the survival rate for juvenile English soles. The juveniles also tend to accumulate many of the contaminants found in their environment and this exposure manifests itself as tumors, sores, and reproductive failures. Ardenwood and Alameda Creeks would not provide suitable habitat for spawning by English sole but there is a potential for juvenile sole to inhabit the estuary and near-shore waters of South San Francisco Bay.

Impacts and Mitigation Measures

Significance Criteria

Consistent with Appendix G of the State CEQA Guidelines, a project would cause significant adverse impacts to biological resources if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife, the National Marine Fisheries Service, or U.S. Fish and Wildlife Service.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan.

Approach to Analysis

In evaluating the potential for the proposed Project actions to affect each species, the initial consideration is whether there is suitable and/or occupied habitat for the species within the specific boundaries of the proposed Project. Indirect effects may still be considered if there is a mechanism for them. In addition, if the proposed Project affects an area of Designated Critical Habitat or is targeted for the recovery of the species, then there may be a potential for direct or indirect effects, whether the habitat is occupied or not. Accordingly, for each species an initial evaluation was made, focusing on:

- Is there suitable habitat for each species within the areas in which the proposed Project may have effects?
- Is there evidence that the species actually occurs within the areas affected by the proposed Project?

If there is potential suitable habitat for a species and there is evidence that the species actually occurs in the areas affected by the proposed Project, then, the potential for adverse impacts was addressed in detail, focusing on:

- Is the habitat designated as Critical Habitat for the species or is it a component of the species Recovery Plan (if one exists)?
- Is there a probability of direct or indirect effects to the species and, if so, what is the potential magnitude of effect?

In the detailed consideration of potential for the proposed Project to adversely affect each species, the focus is on the various mechanisms of effect in each potential area of effect. Thus, for example, for species that occur only downstream of a construction site the analysis of potential for effect is focused on the potential for effects associated with impaired water quality from turbidity and materials spills from construction.

There are a number of ways in which dredging, and construction of the proposed Project could alter physical conditions and, potentially, affect aquatic species. The proposed Project would or could potentially have the following physical mechanisms for effects:

- Dredging and construction may potentially result in habitat loss, injury, or death of individuals inhabiting Ardenwood Creek.
- Dredging and construction may temporarily increase levels of turbidity and potentially cause exposure to spills of fuels or lubricants, which could affect water quality within Ardenwood Creek; and
- In lower Alameda Creek, the estuary and adjacent near-shore waters of South San Francisco Bay, dredging and construction within Ardenwood Creek may temporarily increase levels of turbidity and potentially cause exposure to accidental spills of fuels or lubricants, which could affect water quality.

Potential effects of the proposed Project on fish species are thus addressed in terms of (a) dredging and construction effects on species occurring in Ardenwood Creek, and (b) water quality effects of activities in Ardenwood Creek on species in lower Alameda Creek, the estuary and near-shore waters of South San Francisco Bay.

The assessment of potential effects takes into consideration the significance of an action in terms of its context and intensity and whether or not significant impacts would occur as required by CEQA. This assessment evaluated the potential direct and indirect effects of the proposed Project on each of the species. The analysis included review of ACFCWCD and ACWD surveys from 1999 through 2009 and review of regional analyses by other entities. In addition, state species of concern were also evaluated. The analysis included four elements:

- **Habitat**: Is there suitable habitat for each species within the areas in which the proposed Project may have direct effects?
- **Known Occurrence**: Is there evidence that the species actually occurs within the areas in which the proposed Project may have direct effects?
- **Critical Habitat**: Is the habitat designated as Critical Habitat for the species or is it a component of the species Recovery Plan (if one exists)? NMFS has not designated critical habitat for steelhead in Alameda Creek, however, the creek is an element of the NMFS multi-species salmonid recovery plan.
- **Direct and/or Indirect Effects**: Is there a probability of direct or indirect effects to the species and, if so, what is the potential magnitude of effect?

Based on information available on the geographic distribution of fish species within the Bay-Delta estuary, species life history and habitat requirements, and habitat conditions occurring within Ardenwood Creek, lower Alameda Creek, and the Alameda Creek estuary and near-shore waters of South San Francisco Bay the potential risk of adverse effects of selected fish species was assessed. Findings of this initial impact screening include:

Table 3: Risk of Adverse Effects to Selected Fish Species

Taxon	Occurrence in Ardenwood Creek	Occurrence in Alameda Creek	Occurrence in estuary or near-shore South Bay	Potential Adverse Effect
Longfin smelt (*Spirinchus thaleichthys*)	No	No	Yes	Yes
Pacific lamprey (*Lampetra tridentada*)	No	No	No	None
Green Sturgeon (*Acipenser medirostris*)	No	No	Yes	Yes
Delta smelt (*Hypomesus transpacificus*)	No	No	No	None
Central California Coastal steelhead & Central Valley steelhead (*Oncorhynchus mykiss*)	No	No	Yes	Yes
Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*)	No	No	No	None
Central valley winter-run Chinook salmon. (*Oncorhynchus tshawytscha*)	No	No	No	None
EFH Fall-run Chinook salmon	No	No	Yes	Yes
EFH coastal pelagic fish species	No	No	Yes	Yes
EFH Pacific Groundfish	No	No	Yes	Yes
HAPC Eel grass	No	No	No	None
HAPC Olympia oysters	No	No	No	None
Resident fish community	Yes	Yes	Yes	Yes

Fish species for which the initial impact screening found no potential adverse effect of the proposed Project were not considered further in the assessment.

Comments to Questions

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

Potential adverse effects of the proposed Projection resident and migratory fish and their habitat could occur as a result of installation of cofferdams and reduced water levels in Ardenwood Creek during dredging and construction, exposure to contaminants and toxicity, and spread of invasive species. The effects of each of these potential impact mechanisms to fish and aquatic habitat are addressed below.

Cofferdam Installation, Reduced Water Levels, and Physical Disturbance

As part of the proposed Project cofferdams would be installed in Ardenwood Creek to reduce water levels in the creek to facilitate channel dredging and construction. The cofferdams would not result in a complete dewatering of the creek channel. A bypass pipeline would be installed to help convey water in the creek from the upstream cofferdam to a discharge location downstream of the lower cofferdam. The cofferdams would serve to contain water disturbed during dredging and construction which, in combination with the existing tidal gates, would control the discharge of water containing elevated turbidity and potential contaminants from being discharged into lower Alameda Creek and passing downstream into the estuary and out into South San Francisco Bay. Daily turbidity water quality monitoring upstream and downstream of the construction site would confirm whether turbidity levels remain acceptable or increase. Unacceptable water quality would be addressed if caused by Contractor construction.

To minimize and avoid adverse effects of the proposed Project activities on resident fish inhabiting the work zone within Ardenwood Creek, a fish relocation would occur as part of cofferdam installation. During cofferdam installation the upstream cofferdam would be installed followed by fishery biologists using a ¼ inch mesh beach seine stretched across the creek channel moving from upstream downstream through the entire reach of the creek to be isolated to heard resident fish out of the construction area. The lower cofferdam would then be closed to isolate the construction reach of the creek before dredging or construction begins. The fish relocation would be performed as a BMP under the direction of a qualified fishery biologist. Water levels in the construction reach would be reduced but not dewatered completely to facilitate channel dredging and removal of sediment and cattails.

Physical disturbance during channel dredging and construction activity would include moving dredging equipment down the creek channel while removing sediment and aquatic plants with associated local and temporary increases in turbidity and suspended sediments within the creek channel. Relocation of fish in combination with disturbance during dredging would be expected to result in temporary effects on the local resident fish populations inhabiting the creek. No threatened or endangered fish are expected to be present in the creek and therefore no adverse effects on these species are expected to occur. Ardenwood Creek is not designated as critical habitat for any fish species. After completion of the dredging and construction the cofferdams would be removed from the creek channel and resident fish would be able to disperse throughout the area.
Since no threatened to endangered fish species or critical habitat would be directly affected by dredging and construction within Ardenwood Creek, and BMPs would avoid and minimize adverse effects on local resident fish species, the impacts of the proposed Project are considered to be less than significant. No further mitigation is required.

Effects from Contaminants and Toxicity

There is the potential that exposure to contaminants associated with dredging and construction activity within Ardenwood Creek could indirectly affect the health of juvenile and adult protected and managed fish species within lower Alameda Creek and estuary and near-shore waters of South San Francisco Bay due to exposure to increased levels of contaminants resulting from accidental spills of fuel and lubricants. An extensive body of scientific information is available on the effects of exposure for various species and life stages of protected fish and other aquatic species to contaminant concentrations. The proposed Project has been designed, and would be constructed, using BMPs specifically intended to avoid and minimize adverse exposure to contaminants. The construction contractor would be required to provide spill containment and emergency response plans during dredging and construction. Spill prevention and cleanup provisions have been integrated into the Project design during construction (e.g., restrictions on refueling near open waters or in-water refueling with appropriate spill prevention, isolation, and response plans). Daily, contractor's construction equipment and fuel and materials stored shall be inspected to verify safety precautions are in place for possible fuel leakage and to verify if any hazardous materials are on-site which could poison or kill any species. All vehicles and the staging areas at the construction site shall be checked daily and inspected to confirm no vehicle fuel or oil leakages have occurred.
In addition, installation of upstream and downstream cofferdams would help isolate the construction area and would serve, with the existing tidal gates, to minimize the risks of indirect impacts resulting from the discharge of contaminated water into Alameda Creek. As a result of these measures, toxicity effects are not expected.

These potential effects would be further reduced for Chinook salmon and steelhead that are not expected to migrate through the lower reach of Alameda Creek and therefore have a low probability of occurrence at the Project site. Juvenile and adult protected and EFH fish species may occur in the Alameda Creek estuary and near-shore waters and potentially be exposed to contaminants during construction, although the risk of adverse effects is reduced by BMPs that include spill prevention and cleanup plans. Construction could potentially result in temporary increased exposure but would be expected to return quickly to background levels as a result of dilution and tidal dispersion once construction is completed. No effect is expected for Chinook salmon, steelhead, or green sturgeon eggs and early larval life stages because spawning at the Project site is not expected given elevated salinity conditions in the estuary and poor-quality spawning habitat in lower Alameda Creek. The existing tidal gates would serve to exclude migratory fish from passing upstream into Ardenwood Creek.

Based on these results, and the BMPs included in the proposed Project, it was concluded that exposure to contaminants from Project dredging and construction is not likely to affect protected or managed fishery resources (less than significant effect). No additional mitigation is required.

Spread of Invasive Species

The Bay-Delta Estuary has been colonized by a large number of introduced exotic (non-native) species. Some species introductions, such as striped bass and American shad, have been made through conscious action while a majority of other species introductions have resulted from the inadvertent transport and release of species into the estuary. Many of the inadvertent species' introductions have occurred as a result of ballast water discharges, associated with importation of oysters, as part of fouling communities on ship hulls, and through a variety of other mechanisms. It has been hypothesized that dredging and construction activity would potentially affect the spread of invasive species of fish or macroinvertebrates within the Bay-Delta Estuary through two potential mechanisms, which include: (1) the transport and introduction of invasive species into the estuary from other water bodies; and (2) disturbance or other changes to subtidal habitat that would favor colonization by invasive species when compared to native species of fish and/or macroinvertebrates.

The proposed Project would not be expected to have any effects on the abundance or distribution of introduced predatory fish species such as striped bass or to result in a direct or indirect increase in the vulnerability of protected fish, including juvenile salmonids and other fish, to predation mortality. As part of the BMPs for the Project only construction equipment from the Bay-Delta area would be used thereby avoiding the potential for introducing non-native species to the Project site. Predatory fish species such as largemouth bass, white catfish, pikeminnow, etc. are not expected to be present at in Ardenwood Creek. Based on these factors it was concluded that the proposed Project would not result in an increased risk of adverse effects associated with non-native species interactions with protected fish species. Benthic disturbance during construction would be limited to only Ardenwood Creek and would not be expected to result in significant changes in the distribution or abundance of non-native species. No take of protected or managed fish is expected to occur as a result of proposed Project effects on non-native species inhabiting the Project site. The proposed Project would not result in benthic disturbance in lower Alameda Creek, the estuary, or near-shore waters of South San Francisco Bay that would benefit non-native invasive aquatic species.

Based on these factors it was concluded the effects of the proposed Projection non-native species is not likely to affect protected and managed fishery resources inhabiting the Project site (no effect). No further mitigation is required.

Potential Impacts to Eel Grass Beds

No impacts of the proposed Projection eel grass are expected since the Project site is not located in an area where eel grass occurs. The distribution of eel grass beds in San Francisco Bay (Hanson *et al.* 2004, Merkel & Associates 2008, 2010) shows relatively small areas colonized in Richardson Bay, adjacent to the Alameda shoreline south of the Bay Bridge, near the Emeryville Marina, and in several locations along the Richmond shoreline, Treasure and Yuba Buena islands. No eel grass beds were identified in the vicinity of the proposed Project although eel grass beds are known to be present at other locations along the Alameda shoreline (Merkel & Associates 2008, 2010). The greatest occurrence of eel grass beds has been observed in North San Francisco Bay.

Based on these factors it was concluded the proposed Projects not expected to impact San Francisco Bay eel grass beds (no effect). No further mitigation is required.

Potential Impacts to Native California Oyster Beds

Benthic studies in San Francisco Bay by Applied Marine Sciences (AMS 2009) identified native oysters inhabiting the lower intertidal zone on Treasure Island with the greatest densities along the west and north shorelines. There is no evidence of native oyster beds in the immediate vicinity of the Project site. The proposed Project would not be expected to adversely impact intertidal or shallow subtidal areas within San Francisco Bay where native oysters occur. No significant impacts are expected to occur to native oysters as a result of the proposed Project(no effect). No further mitigation is required.