



Established in 1938

MITIGATED NEGATIVE DECLARATION

MALLARD FARMS PIPELINE REPLACEMENT PROJECT

October 2016



CEQA Lead Agency:

California State Lands Commission
100 Howe Avenue, Suite 100 South
Sacramento, CA 95825

Applicant:

Chevron Pipe Line Company
9525 Camino Media, Room E2031
Bakersfield, CA 93311



MISSION STATEMENT

The California State Lands Commission provides the people of California with effective stewardship of the lands, waterways, and resources entrusted to its care through preservation, restoration, enhancement, responsible economic development, and the promotion of public access.

CEQA DOCUMENT WEBSITE
www.slc.ca.gov/Info/CEQA.html

Geographic Location (Lease PRC 3277):

<u>North Work Area</u>	<u>South Work Area</u>
Latitude: N121.917826	Latitude: N121.928685
Longitude: 38.097002	Longitude: 38.079831
NAD83 Datum	

Cover photo: Suisun Marsh
(Photo courtesy of AECOM)

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LIST OF ABBREVIATIONS AND ACRONYMS

μin/sec	microinches per second
μg/m ³	micrograms per cubic meter
μg/m ³	micrograms per cubic meter
μPa	microPascal
A	
AADT	Annual Average Daily Traffic
AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACM	asbestos-containing material
ASC	Anthropological Studies Center
B	
BAAQMD	Bay Area Air Quality Management District
BAPL	Bay Area Products Line
BCDC	San Francisco Bay Conservation and Development Commission
BMPs	best management practices
C	
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAL FIRE	California State Department of Forestry and Fire Protection
CalEEMod	California Emissions Estimator Model
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBC	California Building Code
CCAA	California Clean Air Act
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH ₄	methane
CNDDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalents
CPL	Chevron Pipe Line Company
CSLC	California State Lands Commission
CTP	Comprehensive Transportation Plan
CWA	Clean Water Act
D	
dB	decibels
dBA	A-weighted decibels
DEPM	Division of Environmental Planning and Management
DOT	U.S. Department of Transportation
DPM	diesel particulate matter

	DPS	Distinct Population Segment
	DTSC	California Department of Toxic Substances Control
	DWR	California Department of Water Resources
E	EFH	Essential Fish Habitat
	EIR	Environmental Impact Report
	EO	Executive Order
	ESU	Evolutionarily Significant Unit
F	FCAA	Federal Clean Air Act
	FESA	Federal Endangered Species Act
	FHWG	Fisheries Hydroacoustic Working Group
	FMP	Fishery Management Plan
	FPD	Fire Protection District
	FTA	Federal Transit Administration
G	GHG	greenhouse gas
H	HAPC	Habitat Area of Particular Concern
	HDD	horizontal directional drilling
	HMTA	Hazardous Materials Transportation Act
I	I-	Interstate
	in/sec	inches per second
	IPCC	Intergovernmental Panel on Climate Change
	IS	Initial Study
L	L _{dn}	day-night average sound level
	Leq	equivalent sound level
	Leq[h]	1-hour, A-weighted equivalent sound level
	L _{max}	maximum sound level
	L _v	Velocity level
M	MBTA	Migratory Bird Treaty Act
	mg/m ³	milligrams per cubic meter
	MM	mitigation measure
	MMP	Mitigation Monitoring Program
	MMPA	Marine Mammal Protection Act
	MMT	million metric tons
	MND	Mitigated Negative Declaration
	MP	Marsh Protection
	MPA	Marine Protected Area
	MPO	metropolitan planning organization
	MTC	Metropolitan Transportation Commission
	MTCO _{2e}	metric tons of CO _{2e}
N	N ₂ O	nitrous oxide
	NAAQS	National Ambient Air Quality Standards
	NAHC	Native American Heritage Commission
	NE	not exceeded
	NMFS	National Marine Fisheries Service
	NO ₂	nitrogen dioxide

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	NOI	Notice of Intent
	NO _x	oxides of nitrogen
	NPDES	National Pollutant Discharge Elimination System
	NPS	National Park Service
	NWIC	Northwest Information Center
	NTIS	National Technical Information Service
O	O ₃	ozone
	OHP	Office of Historic Preservation
	OSPR	Office of Spill Prevention and Response
P	PCBs	polychlorinated biphenyls
	PERP	Portable Equipment Registration Program
	PM ₁₀	particulate matter with aerodynamic diameter of ≤ 10 microns
	PM _{2.5}	particulate matter with aerodynamic diameter of ≤ 2.5 micrometers
	ppb	parts per billion
	ppm	parts per million
	ppt	parts per thousand
	PVC	polyvinyl chloride
R	RMS	root-mean-square
	ROG	reactive organic gases
	RWQCB	Regional Water Quality Control Board
S	SB	Senate Bill
	SEL	sound exposure level
	SFBAAB	San Francisco Bay Area Air Basin
	SFBRWQCB	San Francisco Bay Regional Water Quality Control Board
	SO ₂	sulfur dioxide
	SR	State Route
	STA	Solano Transportation Authority
	SWPPP	Stormwater Pollution Prevention Plan
	SWRCB	State Water Resources Control Board
T	TAC	toxic air contaminant
U	UPRR	Union Pacific Railroad
	USACE	U.S. Army Corps of Engineers
	USBR	U.S. Bureau of Reclamation
	USCG	U.S. Coast Guard
	USEPA	U.S. Environmental Protection Agency
	USFWS	U.S. Fish and Wildlife Service
	USGS	U.S. Geological Survey
V	VdB	vibration or velocity level in decibels

2 This Mitigated Negative Declaration (MND) has been prepared by the California State
3 Lands Commission (CSLC), as lead agency under the California Environmental Quality
4 Act (CEQA) (Pub. Resources Code, § 21000 et seq.), to analyze and disclose the
5 environmental effects associated with the Mallard Farms Pipeline Replacement Project
6 (Project). The Project would authorize Chevron Pipe Line Company (CPL or Applicant)
7 to replace, in kind, part of CPL’s Bay Area Products Line (BAPL) system,¹ specifically a
8 segment of the 8-inch Pittsburg-to-Sacramento lateral pipeline that traverses an area
9 known as Mallard Farms in Suisun Marsh, Solano County (Figure ES-1). The pipeline
10 segment is covered under General Lease – Right-of-Way Use No. PRC 3277.1, which
11 the CSLC issued to Chevron on June 19, 1998, and which expires on April 30, 2022.

12 Recent inspections on the Pittsburg-to-Sacramento lateral pipeline, installed in 1966,
13 identified anomalies (i.e., minor imperfections of the pipe’s walls) in the pipeline. To
14 eliminate the anomalies, CPL proposes to replace an approximately 1.2-mile segment
15 of the pipeline that runs through Mallard Farms with a replacement pipeline segment of
16 the same size as the existing pipeline; the Project would not increase the capacity or
17 throughput of the BAPL. Until permits are obtained, CPL is implementing measures,
18 communicated to and agreed on by the U.S. Department of Transportation Pipeline and
19 Hazardous Materials Safety Administration and California State Fire Marshal, to lower
20 the operating pressure and flow rate of the line.

21 The CSLC concluded that a MND is the appropriate CEQA document for the Project
22 because, while the Initial Study identifies potentially significant impacts related to
23 pipeline replacement, after analysis of all the impacts, CSLC staff believes that
24 mitigation measures (MMs) incorporated into the Project proposal and agreed to by CPL
25 avoid or mitigate those impacts to a point where no significant impacts would occur.

26 **PROPOSED PROJECT**

27 The Project is located within Suisun Marsh, and would temporarily extend into Honker
28 Bay approximately 7,000 feet from shore. The new pipe would be installed using
29 horizontal directional drilling (HDD) under Suisun Marsh from two entry points, located
30 at North and South Work Areas (Figure ES-2). The HDD method would result in fewer
31 impacts to the environment compared to alternatives such as conducting separate
32 repairs to the existing pipeline using open trenching in the marsh.

¹ The BAPL pipeline system consists of a trunk line that originates at the Richmond Refinery in Richmond and runs to Bethany Station near Brentwood. Three pipeline legs branch from the trunk line: one line from Pittsburg north to Sacramento; a second line from Bethany Station south to Banta; and the third line from Bethany Station to San Jose. The BAPL is used to transport refined products (e.g., gasoline, diesel, jet fuel) from the Richmond Refinery to the locations described above.

1 The Project area (Figure ES-2) covers all areas that could be affected directly and
2 indirectly by the Project, including work areas, access routes, and staging areas for
3 equipment and the new section of pipe (also known as the pipe string or backstring)
4 necessary to complete the Project. New pipe would be contained within existing rights-
5 of-way or easements granted by landowners, including the CSLC, to CPL; some
6 easements would be modified to increase widths or allow temporary work access for the
7 Project. Temporary structures related to staging areas, work areas, and the proposed
8 pipe string staging would be located in and north of Honker Bay and would occur on a
9 mix of private lands, state lands, and the Grizzly Island Wildlife Area. The Grizzly Island
10 Wildlife Area is under the jurisdiction of the California Department of Fish and Wildlife
11 (CDFW) and managed by the Suisun Marsh Preservation Agreement.

12 The Project area contains both terrestrial and estuarine environments. Terrestrial
13 environments are found in the North Work Area, access roads, and staging areas. The
14 North Work Area is in a managed portion of the marsh that would be drained during the
15 construction period; the South Work Area is in an open water estuarine environment.
16 The Project area also includes tidally influenced freshwater sloughs, brackish marsh,
17 and tidal bay wetlands. Marshland and sloughs on-site have been managed with
18 engineered earthen levees and tide gates, and exhibit muted or direct tidal influence.

19 **North Work Area**

20 The North Work Area, which would be approximately 200 by 300 feet, would be located
21 within the boundaries of the Grizzly Island Wildlife Area in a seasonally-inundated
22 managed brackish marsh bordered to the north by a levee that separates it from an
23 unvegetated engineered slough channel (Steve's Ditch). Inundation is primarily
24 controlled by two CDFW-operated tide gates north and south of the work area.
25 Seasonal hunting occurs within the Grizzly Island Wildlife Area: elk hunting season
26 begins in late July and continues through late September, and waterfowl hunting season
27 begins in October and continues through February. During hunting seasons, the CDFW
28 restricts access to the Grizzly Island Wildlife Area.

29 A pad would be created in this work area using clean fill material to provide a level and
30 stable work surface. To construct the pad, filter fabric would be installed on the ground
31 surface over any existing vegetation and held in place with sand bags. Vegetation
32 trimming may be necessary before placement of the fabric, but the ground surface
33 would not be cleared to bare ground or graded. Approximately 31,000 tons of 6- to 8-
34 inch rock would be placed on the fabric, followed by approximately 12,000 tons of 3/4-
35 inch base rock on top of the larger rock to create a level work surface (approximately
36 23,500 cubic yards of temporary fill). The work area fill would be covered by a series of
37 interlocking, all-weather mats to help provide a stable work surface to accommodate the
38 drill rig, drill entry (and fluid collection) pit, and construction materials and equipment.

Figure ES-1. Project Location

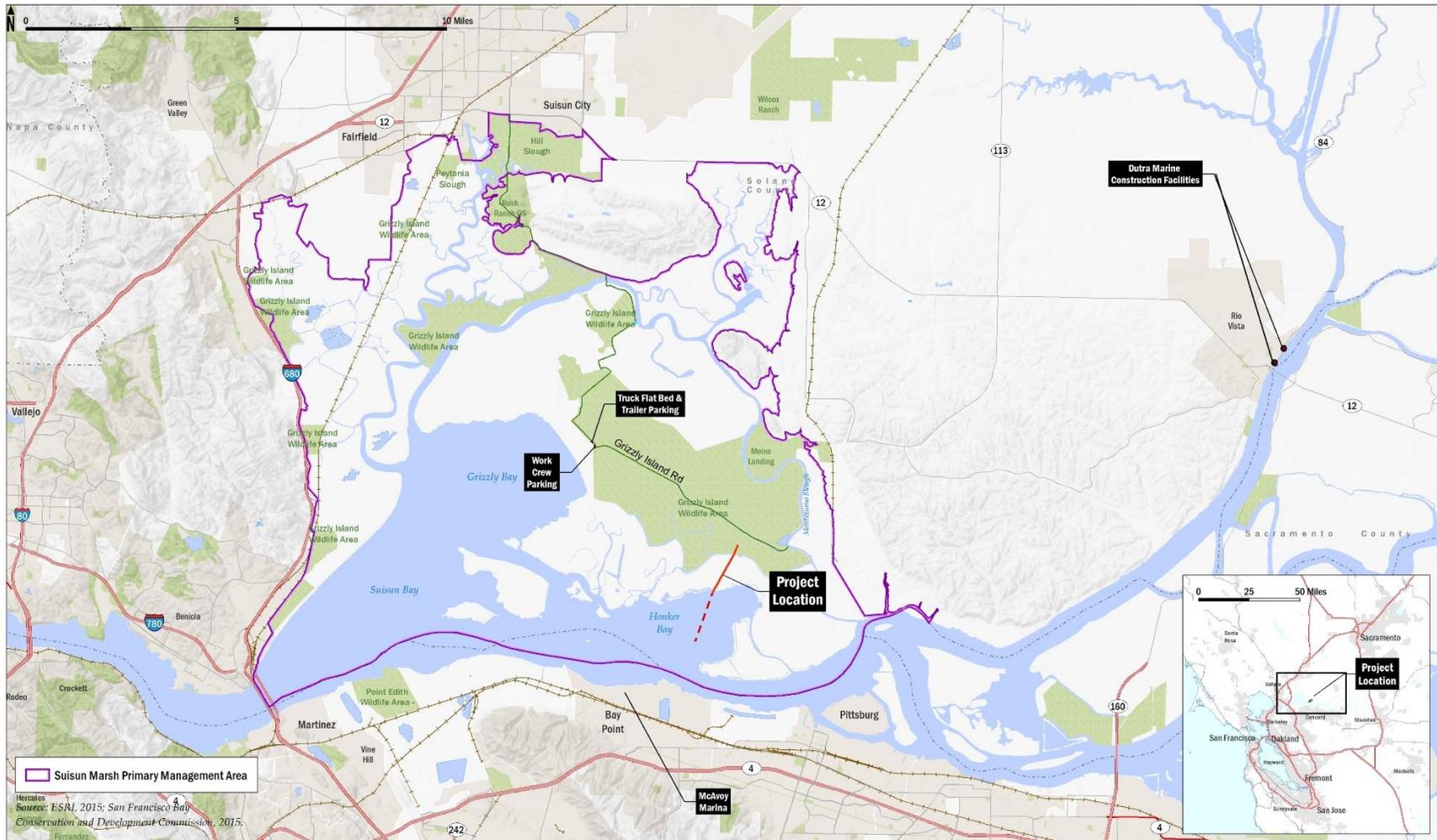
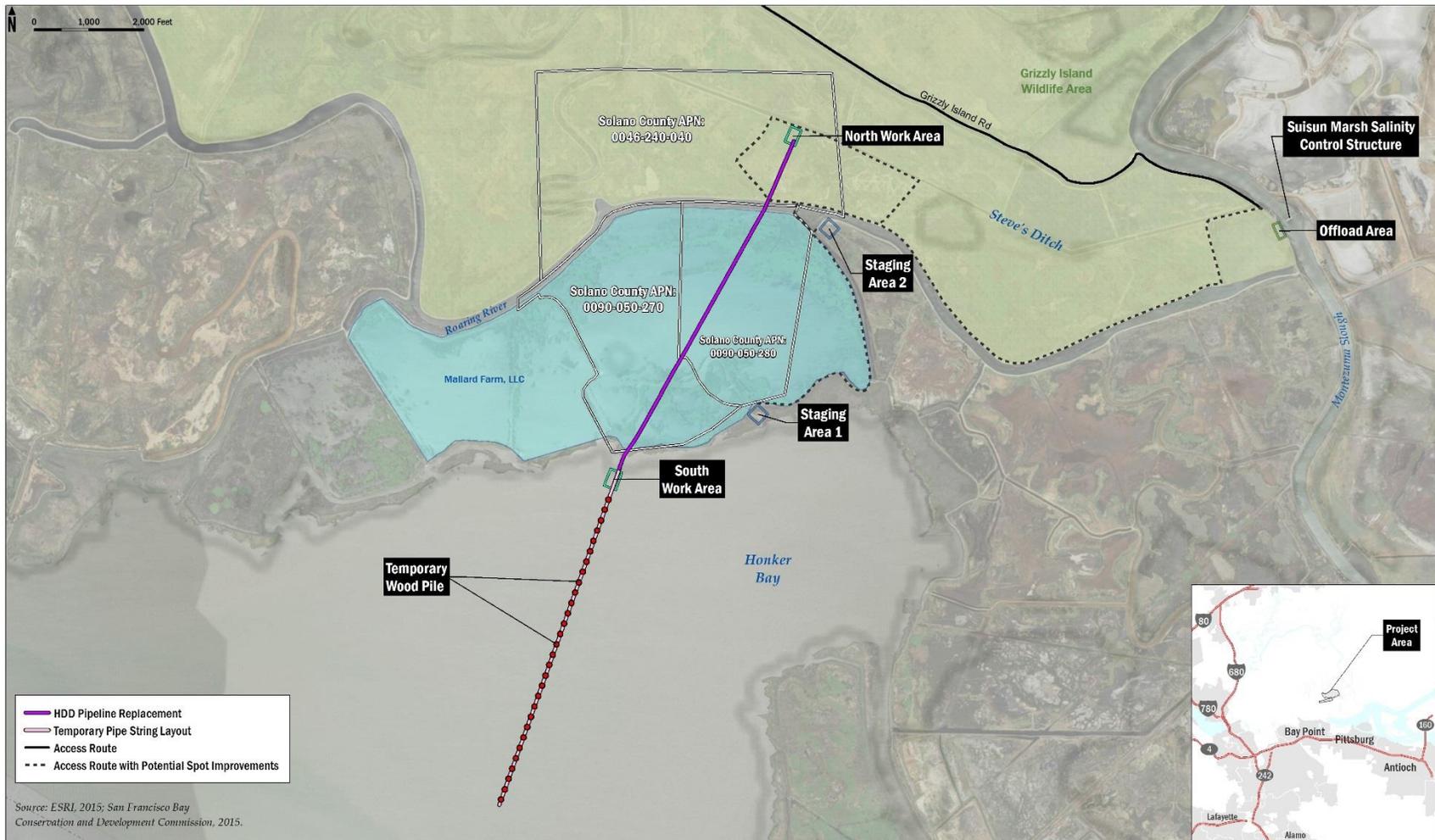


Figure ES-2. Project Area/Site Plan



1 Rock fill material would be transported by barge from the Dutra Materials quarry in San
2 Rafael to an offloading area at Montezuma Slough, just downstream from the Suisun
3 Marsh Salinity Control Structure (Figure ES-2). There it would be offloaded to land using
4 a derrick barge and clamshell rock bucket. The derrick barge and all rock barges would
5 be mobilized to the site by a tugboat. The rock would be loaded directly into dump
6 trucks and would be transported to the work area on existing levee roads. Heavy
7 equipment would be mobilized to the site using public roads, Grizzly Island Road, and
8 levee roads within the boundaries of Suisun Marsh.

9 After construction of the work area pad is completed, drilling equipment would be driven
10 to the site through the Grizzly Island Wildlife Area in multiple tractor-trailer loads.
11 Equipment at the North Work Area would include a 48-foot-long, 8.5-foot-wide drill rig
12 weighing 85,000 pounds with 750,000-pound pushing/pulling capacity. The rig would be
13 driven by a 630-horsepower diesel power unit. The North Work Area would also contain
14 drilling fluid (“mud”) mixing, pumping, and recycling equipment, consisting of a mixing
15 tank, pumps to transfer the drilling fluid through the system, and a 6,000-gallon tank and
16 system to clean the drilling fluid for reuse. A control unit consisting of a 20-by-8.5-by-
17 8.5-foot container mounted on a drop deck trailer would provide climate-controlled
18 housing for the driller and surveyor and house rig controls, monitoring gauges, and
19 other surface equipment used to monitor and record signals received from the down-
20 hole directional equipment. A 250-kilowatt generator would supply power. The work
21 area would also include three 21,000-gallon water storage tanks, portable sanitary
22 facilities for workers, and covered, latched trash receptacles.

23 **South Work Area**

24 The South Work Area would be located in Honker Bay approximately 350 feet offshore
25 and in alignment with the existing pipeline. Water depth at the South Work Area ranges
26 from 5 feet deep (during mean lower low water) to 10.8 feet deep (during mean higher
27 high water). The substrate in the South Work Area is bay mud.

28 Before construction begins, a crane would lift the concrete mats protecting the existing
29 pipeline onto a barge for storage. To support drilling activities and equipment, a new
30 200-by-50-foot platform would be constructed by driving fifty 14-inch “H” piles,
31 approximately 50 feet in length, into the floor of Honker Bay with a vibratory pile driving
32 hammer. About 10 percent of the piles would be “proofed,” using a small number of
33 strikes from an impact pile driving hammer, to verify that the piles were set and had the
34 appropriate capacity. The first 50 feet of the work platform would be constructed from
35 south to north using a 200-ton crane supported on a spud barge (a flat barge with long
36 posts on each corner that are lowered to hold the barge in place or raised to reposition
37 the barge). A tug, working at high tide, would maneuver the spud barge and a flat deck
38 support barge into place. The support barge would carry the piles and other materials.
39 After the initial portion of the platform is constructed, the crane would be moved from

1 the spud barge to the platform, and the remainder of the platform would be constructed
2 using the crane supported on the platform.

3 Equipment would be located on the work platform and on a barge fleet. During drilling
4 and pipe installation, equipment would include a 47-foot-long by 8.5-foot-wide drill rig
5 weighing 68,000 pounds with 160,000 pounds of pushing/pulling force. A 200-by-60-foot
6 “mud barge” would be moored to the work platform during Project construction, and two
7 additional support barges (a 200-by-60-foot water barge and a 90-by-24-foot cuttings
8 barge) would deliver water and haul away drill cuttings. The total work area of the
9 temporary platform and mud barge would be 22,000 square feet (0.5 acre), with a
10 maximum of about 36,000 square feet (approximately 0.8 acre) when the two additional
11 support barges are present (the barges would not be present at all times). This work
12 area would also have a control unit, mixing tank, cleaning unit, tanks, pumps,
13 generators, and sanitary and trash management facilities.

14 **Horizontal Directional Drilling and Pipeline Installation**

15 The Project would use an “intersecting drill” method consisting of two entry points
16 located at the North and South Work Areas. Drilling would be completed in three stages.
17 Stage 1 consists of directionally drilling a pilot hole adjacent to the existing pipeline
18 alignment (in this case, starting from each end and meeting at an intersect point along
19 the drill path). Stage 2 includes reaming the smaller, conjoined pilot hole to the
20 appropriate size for the outer diameter of the new pipe to be installed. In Stage 3, the
21 new section of pipe (also known as the pipe string or backstring) would be pulled
22 through the drilled hole, beginning from the South Work Area in Honker Bay and pulling
23 northerly. The 200-foot pipe sections would be assembled at the Dutra Marine
24 Construction (Dutra) Yard in Rio Vista and then transported down the Sacramento River
25 by barge to Honker Bay. After transport, the 200-foot sections would be welded together
26 on a splicing barge located in Honker Bay.

27 **Demobilization and Site Restoration**

28 After construction activities are completed, all equipment and materials would be
29 removed from the work areas and construction staging areas. All temporary fill used to
30 create the North Work Area, including geotextile mats, rock fill, and filter fabric would be
31 removed. Approximately 350 cubic yards of drill spoils and 6,300 gallons of drilling mud
32 waste would be hauled by barge back to the Dutra Yard for disposal at an appropriate,
33 permitted disposal facility. The site would be restored to pre-Project conditions based on
34 the recommendations or requirements from the resource agencies. At the South Work
35 Area, after the tie-ins and pipeline testing are completed, all temporary structures
36 installed to support drilling, including all barges and vessels, would be removed. The
37 work platform and its piles, and all piles installed to support the new pipe string before
38 installation, would be removed. No permanent above-ground structures would remain.

1 ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION MEASURES

2 The environmental factors checked below in Table ES-1 would be potentially affected
 3 by this Project; a checked box indicates that at least one impact would be a “Potentially
 4 Significant Impact” except that the Applicant has agreed to Project revisions, including
 5 implementation of MMs, that reduce the impact to “Less than Significant with Mitigation,”
 6 as detailed in Section 3, Environmental Checklist and Analysis, of this MND. Table ES-2
 7 lists proposed MMs designed to reduce or avoid potentially significant impacts. With
 8 implementation of the proposed MMs, all Project-related impacts would be reduced to
 9 less than significant.

Table ES-1. Environmental Issues and Potentially Significant Impacts

<input checked="" type="checkbox"/> Aesthetics	<input type="checkbox"/> Agriculture and Forest Resources	<input type="checkbox"/> Air Quality
<input checked="" type="checkbox"/> Biological Resources (Terrestrial and Marine)	<input checked="" type="checkbox"/> Cultural and Paleontological Resources	<input type="checkbox"/> Geology and Soils
<input type="checkbox"/> Greenhouse Gas Emissions	<input checked="" type="checkbox"/> Hazards and Hazardous Materials	<input checked="" type="checkbox"/> Hydrology and Water Quality
<input checked="" type="checkbox"/> Land Use and Planning	<input type="checkbox"/> Mineral Resources	<input type="checkbox"/> Noise
<input type="checkbox"/> Population and Housing	<input type="checkbox"/> Public Services	<input type="checkbox"/> Recreation
<input type="checkbox"/> Transportation/Traffic	<input type="checkbox"/> Utilities and Service Systems	
<input checked="" type="checkbox"/> Mandatory Findings of Significance		
<input type="checkbox"/> Other Major Areas of Concern: Environmental Justice		

Table ES-2. Summary of Proposed Mitigation Measures (MMs)

Aesthetics	
MM AES-1:	Night-Lighting Spillage Minimization
Biological Resources	
MM BIO-1:	Environmental Awareness Training
MM BIO-2:	Biological Monitoring and Surveying
MM BIO-3:	Wildlife Exclusion Fencing
MM BIO-4:	Migratory Bird Avoidance
MM BIO-5:	North Work Area Vegetation Impact Minimization Plan
MM BIO-6:	Revegetation and Monitoring Plan
MM BIO-7:	Emergent Wetland Vegetation Avoidance
MM BIO-8:	Turbidity and Sedimentation Minimization
MM BIO-9:	Pile Driving Soft-Start Technique
MM AES-1:	Night-lighting Spillage Minimization
MM HWQ-1:	Stormwater Pollution Prevention Plan (SWPPP)

Table ES-2. Summary of Proposed Mitigation Measures (MMs)

Cultural and Paleontological Resources	
MM CUL-1:	Discovery of Previously Unknown Cultural Resources
MM CUL-2:	Inadvertent Discovery of Paleontological Resources
MM CUL-3:	Inadvertent Discovery of Human Remains
Hazards and Hazardous Materials	
MM HAZ-1:	Oil Spill Response Plan (OSRP)
MM HAZ-2:	Pipeline Cleaning and Containment
MM HAZ-3:	Inadvertent Return Contingency Plan
MM HAZ-4:	Asbestos Handling Procedures
Hydrology and Water Resources	
MM HWQ-1:	Stormwater Pollution Prevention Plan (SWPPP)
MM HWQ-2:	Hydrostatic Test Water Disposal
MM BIO-8:	Turbidity and Sedimentation Minimization
Land Use and Planning	
MM BIO-1:	Environmental Awareness Training
MM BIO-2:	Biological Monitoring and Surveying
MM BIO-3:	Wildlife Exclusion Fencing
MM BIO-4:	Migratory Bird Avoidance
MM BIO-5:	North Work Area Vegetation Impact Minimization Plan
MM BIO-6:	Revegetation and Monitoring Plan
MM BIO-7:	Emergent Wetland Vegetation Avoidance
MM BIO-8:	Turbidity and Sedimentation Minimization
MM BIO-9:	Pile Driving Soft-Start Technique

1.0 PROJECT AND AGENCY INFORMATION

1.1 PROJECT TITLE

Mallard Farms Pipeline Replacement Project (Project)

1.2 LEAD AGENCY AND PROJECT SPONSOR

<u>Lead Agency:</u> California State Lands Commission 100 Howe Avenue, Suite 100-South Sacramento, CA 95825	<u>Contact person:</u> Kelly Keen, Environmental Scientist Division of Environmental Planning and Management kelly.keen@slc.ca.gov (916) 574-1938
<u>Applicant:</u> Chevron Pipe Line Company 9525 Camino Media, Room E2031 Bakersfield, CA 93311	<u>Contact person:</u> Caroline Burda, Environmental Specialist caroline.burda@chevron.com (713) 432-3712

1.3 PROJECT LOCATION

The Project would authorize Chevron Pipe Line Company (CPL or Applicant) to replace, in kind, an approximately 1.2-mile segment of the 8-inch Pittsburg-to-Sacramento lateral pipeline that runs through Mallard Farms in an area within Suisun Marsh, Solano County (Figure 1-1). The pipeline is covered under General Lease – Right-of-Way Use No. PRC 3277.1, which the California State Lands Commission (CSLC) issued to CPL on June 19, 1998, and which expires on April 30, 2022.

The Project would temporarily extend into Honker Bay approximately 7,000 feet from shore. The Project area (Figure 1-2) covers all areas that could be affected directly and indirectly by the Project, including the North Work Area, South Work Area, access routes, and staging areas for equipment and the new section of pipe (also known as the pipe string or backstring) necessary to complete the Project. New pipe would be contained within existing rights-of-way or easements granted by landowners, including the CSLC, to CPL; some easements would be modified to increase widths or allow temporary work access for the Project. Temporary structures related to staging areas, work areas, and the proposed pipe string staging would be located in and north of Honker Bay and would occur on a mix of private lands, state lands, and the Grizzly Island Wildlife Area. The Grizzly Island Wildlife Area is under the jurisdiction of the California Department of Fish and Wildlife and managed by the Suisun Marsh Preservation Agreement.

1 Suisun Marsh is part of the San Francisco Bay tidal estuary and is the largest
2 contiguous brackish marsh on the West Coast. Formed by the confluence of the
3 Sacramento and San Joaquin Rivers, marshland and sloughs have been managed with
4 engineered earthen levees and exhibit muted or direct tidal influence. All wetlands in the
5 Project area are subject to U.S. Army Corps of Engineers jurisdiction under Section 404
6 of the Clean Water Act or Section 10 of the Rivers and Harbor Act.

7 Land within areas traversed by the Project consist primarily of natural lands managed
8 for wildlife, hunting (elk in late summer and waterfowl in fall through early spring), and
9 recreational uses. Sensitive terrestrial species that have the potential to occur in the
10 area include Ridgway's (California clapper) rail (*Rallus longirostris obsoletus*), California
11 black rail (*Laterallus jamaicensis coturniculus*), and salt marsh harvest mouse
12 (*Reithrodontomys raviventris*). Suitable habitat for sensitive plant species, such as soft
13 bird's beak (*Chloropyron molle* ssp. *molle*), may also be present. Fish species, such as
14 Delta smelt (*Hypomesus transpacificus*), steelhead (*Oncorhynchus mykiss*), Chinook
15 salmon (*O. tshawytscha*), and green sturgeon (*Acipenser medirostris*) can be found in
16 Honker Bay.

17 **1.4 ORGANIZATION OF MITIGATED NEGATIVE DECLARATION**

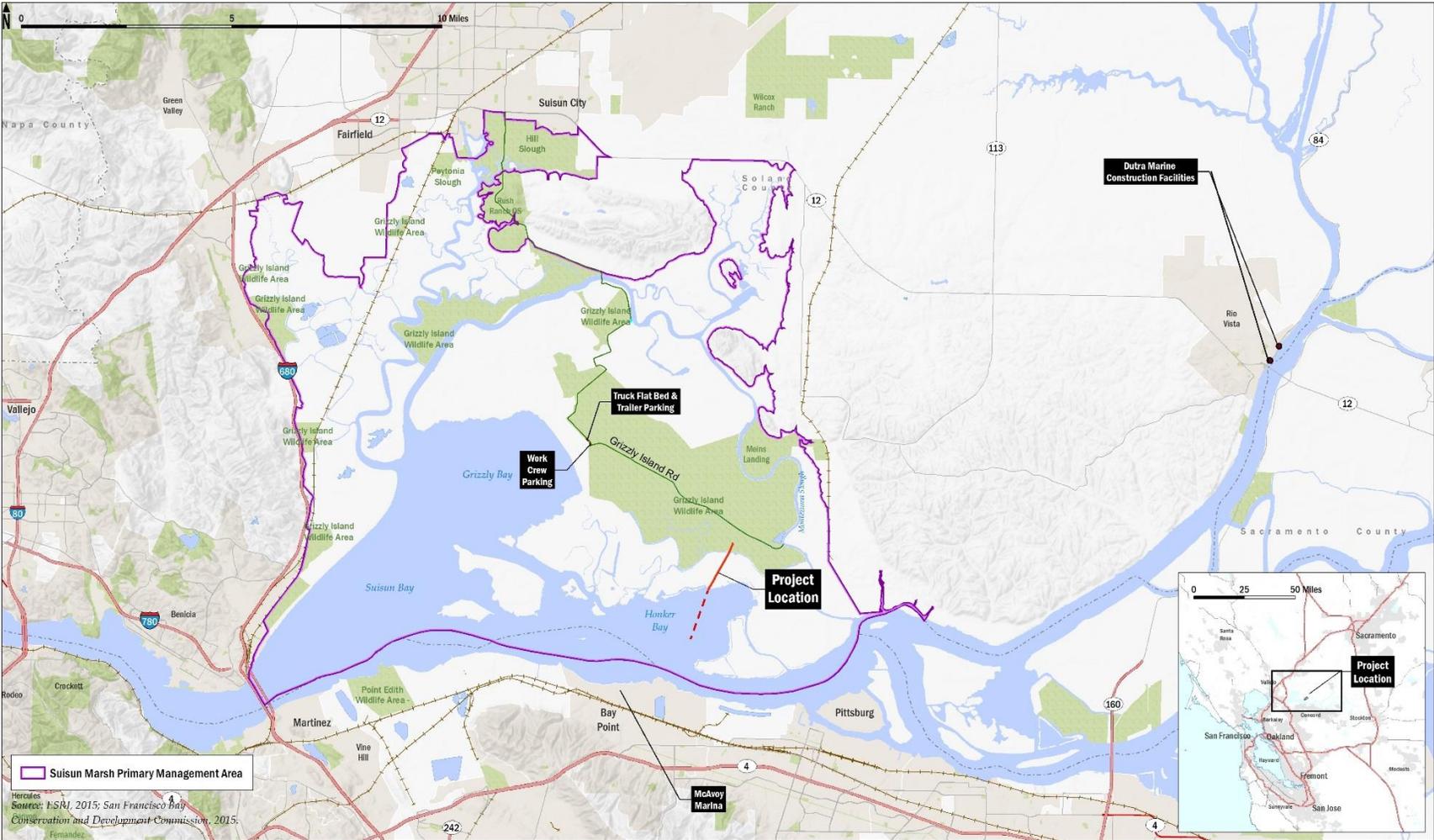
18 This Mitigated Negative Declaration (MND) is intended to provide the CSLC, as lead
19 agency under the California Environmental Quality Act (CEQA) (Pub. Resources Code,
20 § 21000 et seq.), and other responsible and trustee agencies with the information
21 required to exercise their discretionary responsibilities with respect to the Project. The
22 document is organized as follows.

- 23 • **Section 1** provides agency and applicant information, identifies the Project
24 location, background, and objectives, summarizes the public review and
25 comment process, and lists anticipated agency actions.
- 26 • **Section 2** describes the proposed Project including its layout, equipment, and
27 facilities and provides an overview of the Project's operations and schedule.
- 28 • **Section 3** provides the Initial Study (IS), including the environmental setting,
29 identification and analysis of potential impacts, and discussion of Project
30 changes and measures that, if incorporated into the Project, would mitigate or
31 avoid those impacts, such that no significant effect on the environment would
32 occur. The IS was conducted by the CSLC pursuant to State CEQA Guidelines
33 section 15063.²
- 34 • **Section 4** includes an environmental justice analysis consistent with CSLC
35 Policy.

² The State CEQA Guidelines are found in California Code of Regulations, Title 14, section 15000 et seq.

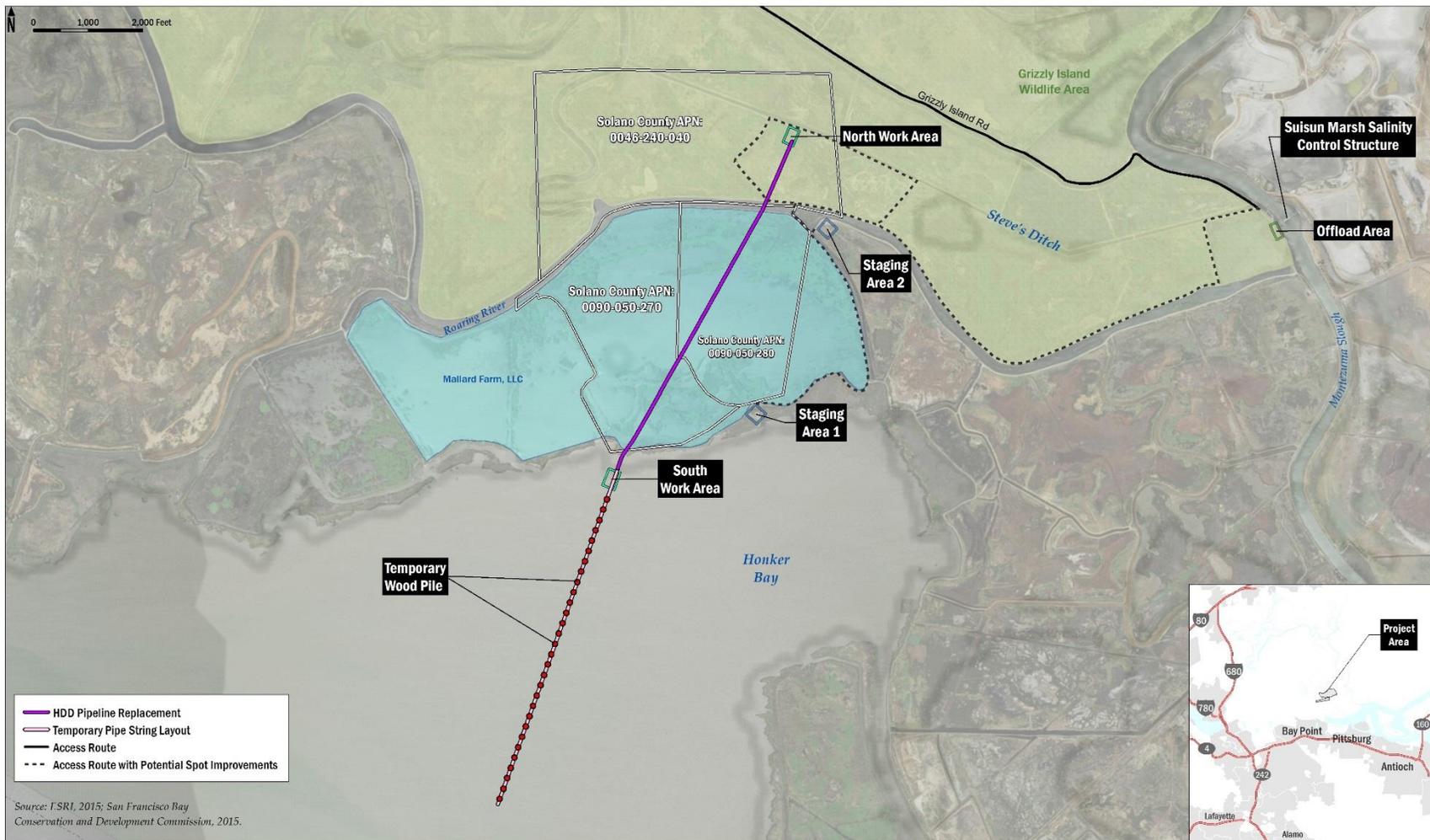
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Figure 1-1. Project Location



1

Figure 1-2. Project Area/Site Plan



- 1 • **Section 5** presents the Mitigation Monitoring Program (MMP).
- 2 • **Section 6** presents information on report preparation and references.
- 3 • **Appendices.** The appendices include specifications, technical data, and other
4 information supporting the analysis presented in this MND.
 - 5 ○ **Appendix A:** Abridged List of Major Federal and State Laws, Regulations,
6 and Policies Potentially Applicable to the Project
 - 7 ○ **Appendix B:** Equipment List; Air Emissions Calculation Methodologies
 - 8 ○ **Appendix C:** Plants and Wildlife Observed During Site Visits
 - 9 ○ **Appendix D:** Draft Contingency Plan for Inadvertent Return of Non-
10 Hazardous Drilling Fluid

11 **1.5 PROJECT BACKGROUND AND OBJECTIVES**

12 CPL owns and operates the Bay Area Products Line (BAPL). The BAPL pipeline system
13 consists of a trunk line that originates at the Richmond Refinery in Richmond, California,
14 and runs to Bethany Station near Brentwood. Three pipeline legs branch from the trunk
15 line: one line begins in Pittsburg and travels north to Sacramento; a second line runs
16 from Bethany Station south to Banta; and the third line extends from Bethany Station to
17 San Jose. The BAPL is used to transport refined products (e.g., gasoline, diesel, jet
18 fuel) from the Richmond Refinery to the locations described above.

19 CPL performs regular maintenance on the pipeline to provide public safety, protect the
20 environment through which the pipeline runs, and comply with U.S. Department of
21 Transportation (DOT) Pipeline and Hazardous Materials Safety Administration
22 regulations and requirements. Recent inspections on the Pittsburg-to-Sacramento
23 lateral pipeline, installed in 1966, detected anomalies (i.e., minor imperfections of the
24 pipe's walls) in the segment that traverses Mallard Farms in Suisun Marsh. Until permits
25 are obtained, CPL is implementing measures to address these anomalies and protect
26 the public and the environment, including pressure reductions ("de-rates") to lower the
27 operating pressure and flow rate of the line. The de-rates are agreed on with and
28 communicated to DOT and the California State Fire Marshal.

29 To eliminate these anomalies and reduce the impacts from future maintenance and
30 repairs in Suisun Marsh, CPL proposes to replace an approximately 1.2-mile segment
31 of the 8-inch Pittsburg-to-Sacramento lateral pipeline that runs through Mallard Farms
32 with a replacement pipeline segment that is the same size as the existing pipe; the
33 Project would not increase the capacity or throughput of the BAPL. The new pipe would
34 be installed by using horizontal directional drilling (HDD) under Suisun Marsh from two
35 entry points, located at the North and South Work Areas. The HDD method would result

1 in fewer impacts to the environment compared to alternatives such as conducting
2 separate repairs to the existing line using open trenching in the marsh.

3 The Project objectives are to:

- 4 • Protect people and the environment by maintaining the integrity and reliability of
5 the pipeline;
- 6 • Reduce the impacts from future maintenance and repairs in the Suisun Marsh;
7 and
- 8 • Minimize impacts on high-value wetlands that are part of the Suisun Marsh
9 Preservation Agreement and the potential future Mallard Farms Conservation
10 Bank.

11 **1.6 PUBLIC REVIEW AND COMMENT**

12 In accordance with State CEQA Guidelines sections 15072 and 15073, the CSLC is
13 releasing this MND for a 30-day public review period to provide local and state agencies
14 and the public the opportunity to review and comment on the document. In
15 accordance with State CEQA Guidelines section 15074, subdivision (b), the CSLC
16 would review and consider the MND, together with any comments received during the
17 public review process and any modifications made in response to comments, prior to
18 taking action on the MND and Project.

19 **1.7 APPROVALS AND REGULATORY REQUIREMENTS**

20 **1.7.1 California State Lands Commission**

21 All tidelands and submerged lands, granted or ungranted, as well as navigable lakes
22 and waterways, are subject to the protections of the common law Public Trust. The
23 State of California acquired sovereign ownership of all tidelands and submerged lands
24 and beds of navigable lakes and waterways upon its admission to the United States in
25 1850. The State holds these lands for the benefit of all people of the State for statewide
26 Public Trust purposes, which include but are not limited to waterborne commerce,
27 navigation, fisheries, water-related recreation, habitat preservation, and open space. On
28 tidal waterways, the State's sovereign fee ownership extends landward to the mean high
29 tide line, except for areas of fill or artificial accretion. The CSLC's authority is set forth in
30 division 6 of the Public Resources Code and it is regulated by the California Code of
31 Regulations, title 2, sections 1900–2970. The CSLC has authority to issue leases or
32 permits for the use of sovereign lands held in the Public Trust, including all ungranted
33 tidelands, submerged lands, and the beds of navigable lakes and waterways, as well
34 as certain residual and review authority for tidelands and submerged lands legislatively
35 granted in trust to local jurisdictions (Pub. Resources Code, §§ 6301, 6306). The
36 CSLC has received an application to amend the existing lease for the Project.

1 The CSLC must comply with CEQA when it undertakes an activity defined by CEQA as
 2 a "project" that must receive discretionary approval (i.e., the CSLC has the authority to
 3 approve or deny the requested lease, permit, or other approval) which may cause either
 4 a direct physical change in the environment or a reasonably foreseeable indirect
 5 change in the environment. CEQA requires the CSLC to identify the significant
 6 environmental impacts of its actions and to avoid or mitigate those impacts, if feasible.

7 **1.7.2 Other Agencies**

8 In addition to the CSLC, the Project is subject to the review and approval of other federal,
 9 state, and local entities with statutory and/or regulatory jurisdiction over various aspects
 10 of the Project (see Table 1-1). As part of the Project, all required permits would be
 11 acquired before the start of construction.

Table 1-1. Agencies with Review/Approval over Project Activities

Permitting Agency		Anticipated Approvals/ Regulatory Requirements
State	California State Lands Commission	Lease Amendment
	Department of Water Resources	Permit to drill under the Roaring River
	San Francisco Bay Regional Water Quality Control Board	Water Quality Certification pursuant to Clean Water Act (CWA) Section 401
	San Francisco Bay Conservation and Development Commission	Major Permit for temporary fill in the primary management area of the Suisun Marsh pursuant to the McAteer-Petris Act
	California Department of Fish and Wildlife	California Endangered Species Act – Section 2081, Incidental Take Permit
Federal	U.S. Army Corps of Engineers, San Francisco District	Nationwide Permit #12 CWA Section 404 permit to place temporary fill within waters of the U.S., including wetlands
	U.S. Coast Guard	Local Notice to Mariners for the temporary layout of the pipe string in Honker Bay
	U.S. Fish and Wildlife Service	Section 7 consultation
	National Marine Fisheries Service	Section 7 consultation

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2.0 PROJECT DESCRIPTION

As discussed in Section 1.5, Project Background and Objectives, Chevron Pipe Line Company (CPL) is proposing to address anomalies in a portion of the 8-inch Pittsburg-to-Sacramento lateral pipeline that traverses an area known as Mallard Farms in Suisun Marsh, Solano County (see Section 1.3, Project Location, and Figures 1-1 and 1-2). To eliminate these anomalies and reduce the impacts from future maintenance and repairs in Suisun Marsh, CPL proposes to replace an approximately 1.2-mile segment of the pipeline with a new segment of the same size as the existing pipe. The new pipe would be installed using horizontal directional drilling (HDD) under the marsh.

2.1 PROJECT WORK AREAS

The Project area would have two entry points from which the drilling would occur, located at the North and South Work Areas, as shown in Figure 1-2. The North and South Work Areas, as well as temporary staging areas, are described below (see Figures 2-1 and 2-1).

2.1.1 North Work Area

The North Work Area, which would be approximately 200 by 300 feet (Figure 2-1), would be located within the boundaries of the Grizzly Island Wildlife Area, which is under the jurisdiction of the California Department of Fish and Wildlife (CDFW), in a seasonally-inundated managed brackish marsh bordered to the north by a levee that separates it from an unvegetated engineered slough channel (Steve's Ditch). Inundation is primarily controlled by two CDFW-operated tide gates. CDFW restricts access to the Grizzly Island Wildlife Area during elk hunting season, which runs from late July to late September, and waterfowl hunting season, which runs from October to February.

A pad would be created in this work area, using clean fill material to provide a level and stable work surface. To construct this pad, filter fabric would be installed on the ground surface over any existing vegetation and held in place with sand bags. Vegetation trimming may be necessary before placement of the fabric, but the ground surface would not be cleared to bare ground or graded. Approximately 31,000 tons of 6- to 8-inch rock would be placed on the fabric, followed by approximately 12,000 tons of 3/4-inch base rock on top of the larger rock, to create a level work surface (approximately 23,500 cubic yards of temporary fill). A low ground pressure bulldozer would push out the first layer of the material over the top of the fabric. A larger bulldozer would be used to push out more of the material after a firm lower layer is established. The work area fill would be covered by a series of interlocking, all-weather mats, which would help provide a stable work surface to accommodate the drilling rig, drill entry (and fluid collection) pit, and construction materials and equipment.

1 Rock fill material for the work area pad would be carried by barge from the Dutra
2 Materials quarry in San Rafael to an offloading area at Montezuma Slough downstream
3 of the Suisun Marsh Salinity Control Structure (Figures 1-2 and 2-1). A tugboat would
4 transport all rock barges and a derrick barge to the site. Rock would be offloaded using
5 the derrick barge and a clamshell rock bucket directly into dump trucks and transported
6 to the work area on existing levee roads. Heavy equipment would be mobilized to the
7 site using public roads, Grizzly Island Road, and levee roads within the boundaries of
8 Suisun Marsh. After completion of the work area pad, additional construction equipment
9 would be driven to the site in multiple tractor-trailer loads.

10 Equipment at the North Work Area would consist of a drill rig that is 48 feet long and 8.5
11 feet wide, weighs 85,000 pounds, is driven by a 630-horsepower diesel power unit, and
12 has a 750,000-pound pushing or pulling capacity. The North Work Area would also
13 contain a tank for mixing drilling fluid (“drilling mud”), pumps to transfer the drilling fluid
14 through the system, and a 6,000-gallon tank and system to clean the drilling fluid for
15 reuse (recycling) during drilling. A control unit consisting of a 20-by-8.5-by-8.5-foot
16 container mounted on a drop deck trailer would provide climate-controlled housing for
17 the driller and surveyor. All rig controls and monitoring gauges, as well as the surface
18 equipment used to monitor and record the signals received from the down-hole
19 directional equipment, would be housed in the control unit. A 250-kilowatt generator
20 would be brought on-site to supply power, and three 21,000-gallon water storage tanks
21 would be needed to support drilling. The work area would also have portable sanitary
22 facilities for workers and covered, latched trash receptacles.

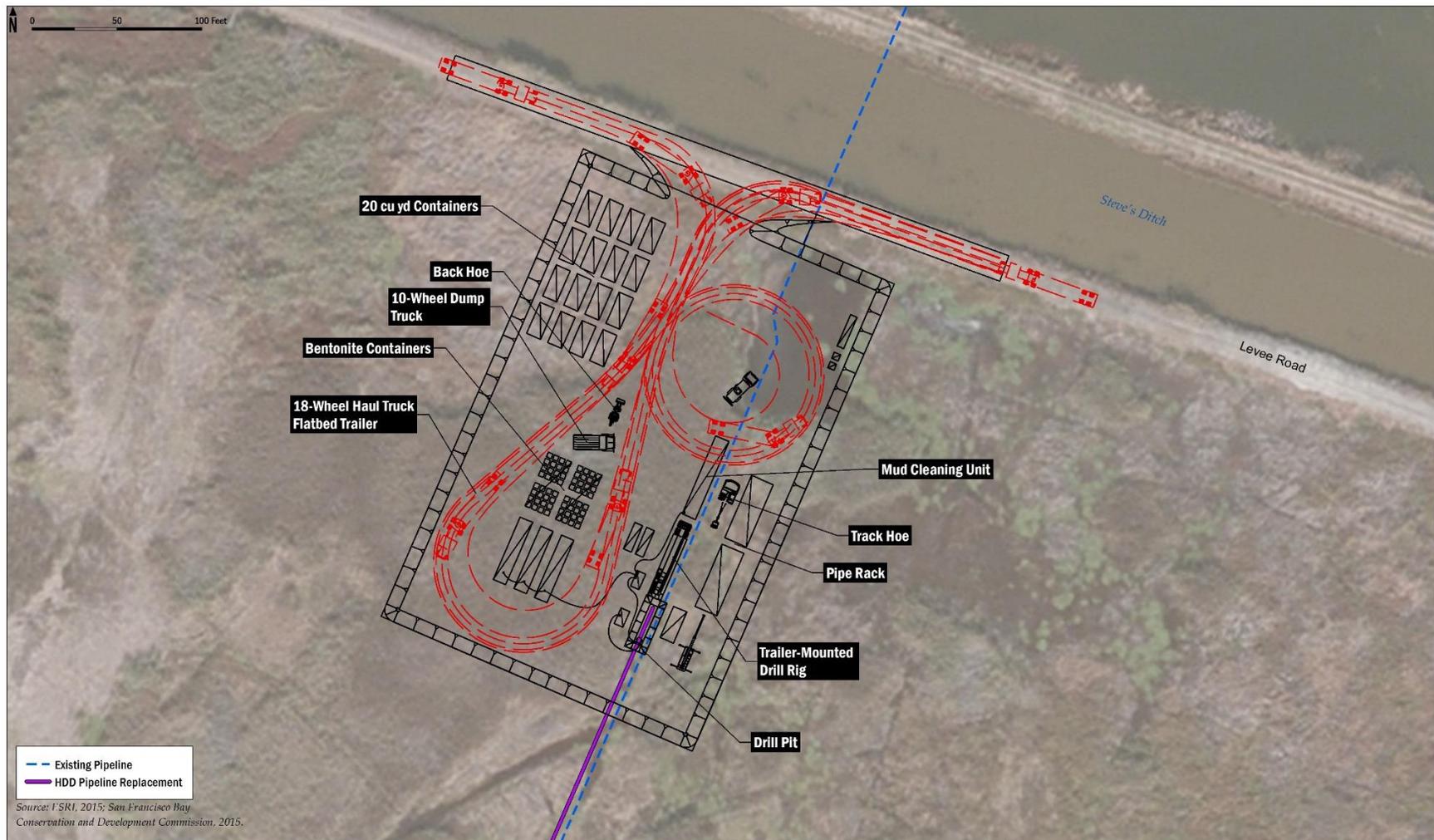
23 **2.1.2 South Work Area**

24 The South Work Area would be over water, located approximately 350 feet offshore and
25 in alignment with the existing pipeline (Figure 2-2). A 200-by-50-foot pile-supported
26 platform would be built to support drilling activities and equipment. Before the platform is
27 installed, the concrete mats protecting the existing pipeline will be lifted by crane onto a
28 barge for storage. The platform would be supported by fifty 14-inch “H” piles,
29 approximately 50 feet in length. The piles would be driven into the floor of Honker Bay
30 with a vibratory pile driving hammer. Approximately 10 percent of the piles would be
31 “proofed,” using a small number of strikes from an impact pile driving hammer. Proofing
32 would be required to verify that the piles were set and had the appropriate capacity.

33 The first 50 feet of the work platform would be constructed from south to north using a
34 200-ton crane supported on a spud barge (a flat barge with posts on each corner that
35 can be lowered to hold the barge in place and raised to reposition). A tug, working at
36 high tide, would maneuver the spud barge and a flat deck support barge into place. The
37 support barge would carry piles and other materials. After construction of the initial part
38 of the platform, the crane would be moved from the spud barge to the platform, and the
39 platform would be completed using the crane supported on the platform (Figure 2-3).

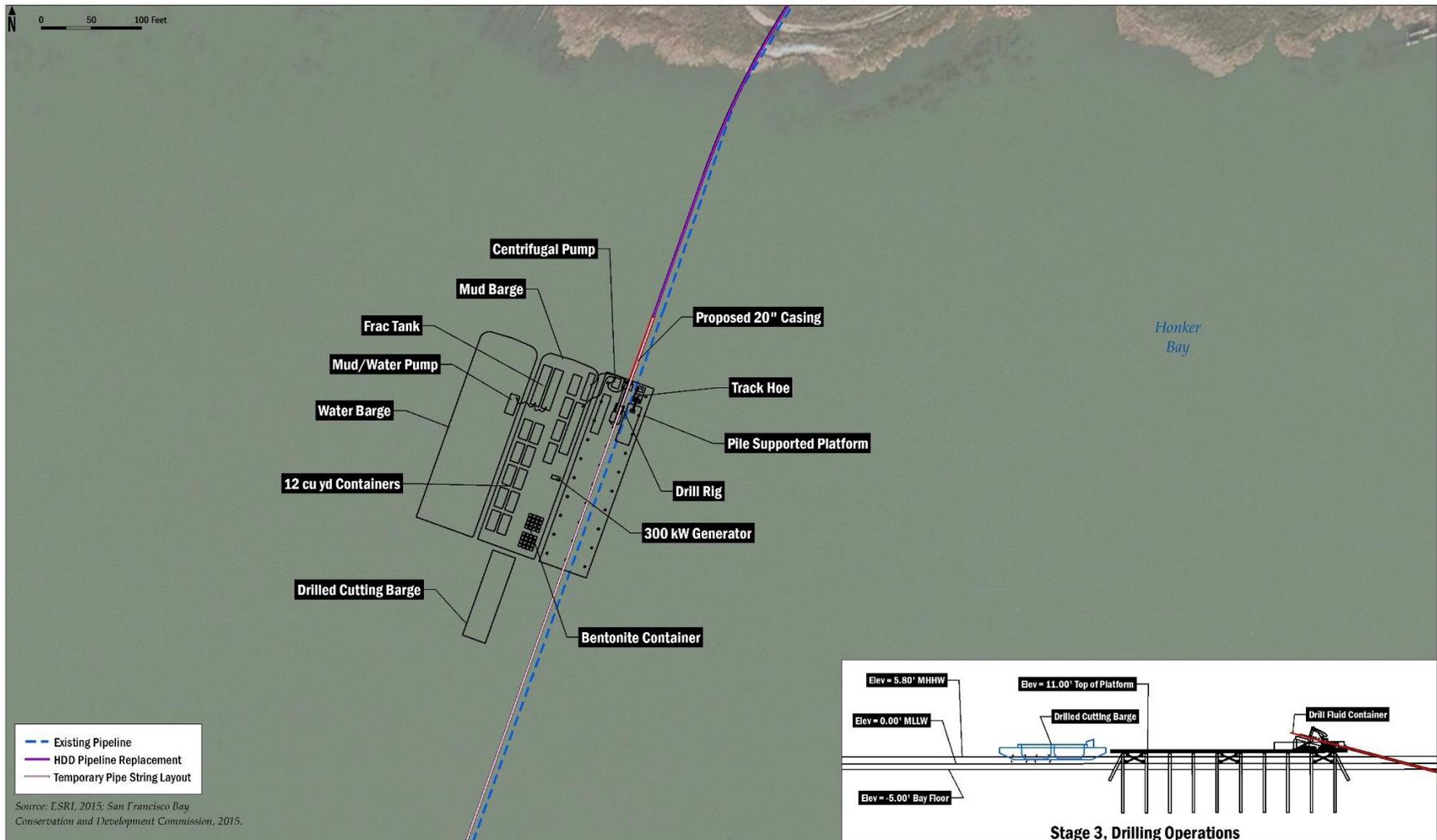
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Figure 2-1. North Work Area



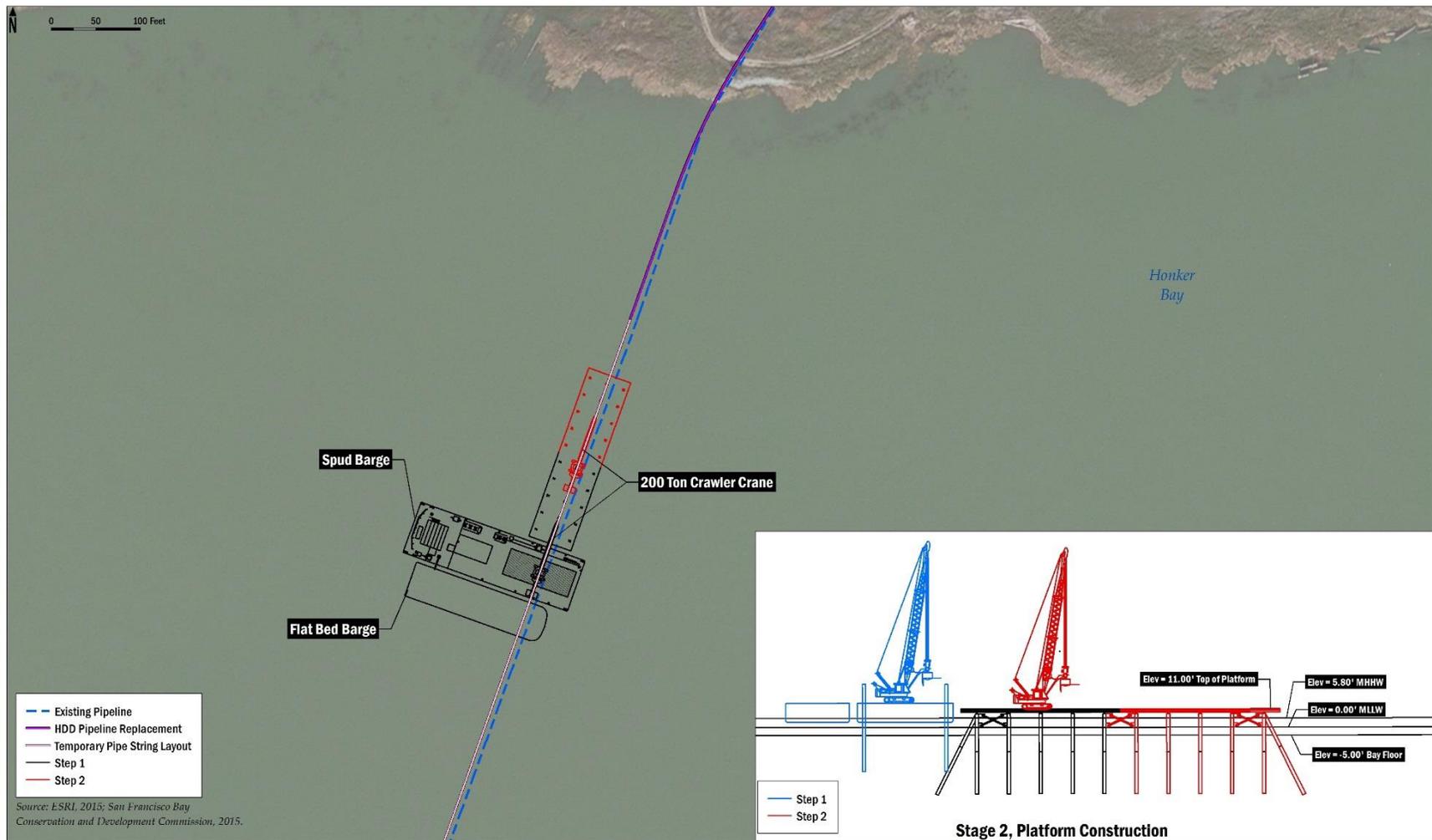
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Figure 2-2. South Work Area



1

Figure 2-3. Plan View and Cross Section: South Work Area Platform Construction



1 During drilling and pipe installation, equipment at the South Work Area would consist of
2 the pile-supported work platform; a 200-by-60-foot support barge (“mud barge”), which
3 would be moored to the work platform during Project construction; and two additional
4 support barges (a 200-by-60-foot water barge and a 90-by-24-foot cuttings barge) that
5 would deliver water and haul away drill cuttings. These two barges would not be present
6 at all times. The total work area of the temporary platform and mud barge would be
7 22,000 square feet (0.5 acre), with a maximum of about 36,000 square feet
8 (approximately 0.8 acre) when the two additional support barges are present.
9 Equipment would be located on the platform and barge fleet, similar to the North Work
10 Area. The drill rig on the platform of the South Work Area platform would be 47 feet long
11 by 8.5 feet wide, weigh 68,000 pounds, and have 160,000 pounds of pushing or pulling
12 force. This work area would also have a control unit, a mixing tank, a cleaning unit,
13 tanks, pumps, generators, and sanitary and trash management facilities.

14 An 8-inch-diameter, 7,000-foot-long steel pipe string would be assembled from 200-foot-
15 long pipe sections. The 200-foot pipe sections would be assembled at the Dutra Marine
16 Construction (Dutra) Yard in Rio Vista (160 River Road, Figure 1-1), then transported
17 down the Sacramento River by barge to Honker Bay. After transport, the 200-foot
18 sections would be welded together on a splicing barge located in Honker Bay. See
19 Section 2.4.1.3 for further discussion of this Project component.

20 **2.1.3 Staging Areas**

21 Two staging areas would support construction activities (see Figure 1-2); both sites
22 would be near the North Work Area on previously disturbed upland areas with no
23 sensitive habitat. Staging Area 1 would be on privately owned land along Honker Bay.
24 Staging Area 2 would be on privately owned land on the south bank of Roaring River.

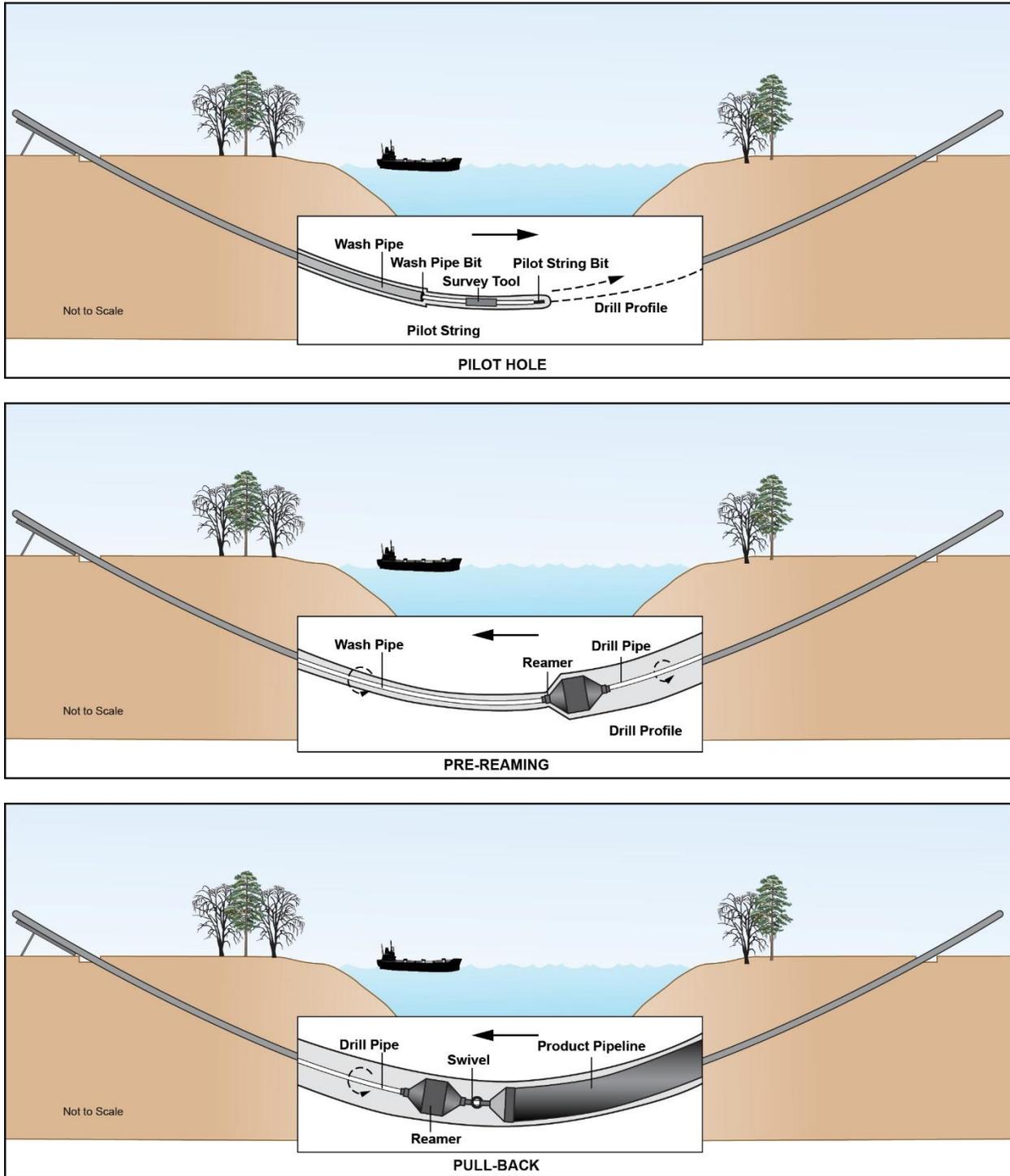
25 **2.2 CONSTRUCTION ACTIVITIES**

26 **2.2.1 Horizontal Directional Drilling**

27 The Project would use an “intersecting drill” method consisting of two entry points
28 located at the North and South Work Areas. Drilling would be completed in three stages:
29 the first stage would consist of directionally drilling a pilot hole adjacent to the existing
30 pipeline alignment (in this case, starting from each end and meeting at an intersect point
31 along the drill path); the second stage would include reaming the smaller, conjoined
32 pilot hole to the appropriate size for the outer diameter of the new pipe to be installed;
33 and the third stage would include pulling the new section of pipe (also known as the
34 pipe string or backstring) through the drilled hole, beginning from the South Work Area
35 in Honker Bay and pulling the pipe to the north. Figure 2-4 shows a cross section of the
36 typical HDD process. The boring and new segment of pipeline would reach a maximum
37 depth of approximately 100 feet below mean sea level.

1

Figure 2-4. Cross Section of Typical HDD Process



1 At the North Work Area, an entry pit would be excavated in the work pad before the
2 start of the drilling to ensure that drilling fluid does not spill onto the work pad or into the
3 surrounding environment. The pit would be approximately 5 feet wide by 10 feet long by
4 5 feet deep. Marsh soils, excavated from the pit, would be stockpiled until construction
5 is complete; upon completion, the marsh soils would be backfilled into the pit. During
6 drilling, mud returns from the borehole would be sent to a mud cleaning system,
7 separating the solids from the drilling fluid so the liquids could be recycled as much as
8 possible to reduce fresh water usage.

9 At the South Work Area, a 20-inch-diameter steel casing would be pushed into the bay
10 bottom at a 10- to 14-degree angle at a depth of approximately 50 feet below the mud
11 surface using a pneumatic pipe ram. This casing would extend to the work platform, and
12 the drill string would be inserted into this casing. The casing would be supported by two
13 H-piles, which would be driven into the bay bottom. The casing would minimize
14 disturbance on the bay bottom, reduce turbidity during drilling by isolating the drilling
15 operation from the surrounding water, and ensure that the drilling mud is captured and
16 recirculated. The casing would be removed prior to the completion of the Project.

17 2.2.1.1 Pilot Hole and Reaming

18 To begin the HDD, a pilot hole would be drilled starting from each entry location (North
19 and South Work Areas), continuing along the designed drill path, and eventually
20 intersecting at a predetermined location. The north drill would be used to drill the
21 majority of the distance (approximately 4,500 feet), and the south drill would drill
22 approximately 2,500 feet. After the drills intersect, the south side drill would pull back
23 and the north drill would push all the way to the South Work Area.

24 After the pilot hole is drilled, the second phase of drilling would enlarge the pilot hole to
25 the final size by passing a larger cutting tool, known as a back reamer, through the pilot
26 hole. Reaming would include connecting a 16-inch cutter on the south end of the drill
27 and pulling it to the north end, using the drill rig for pulling and rotating the drill string
28 and cutter. Similar to drilling the pilot hole, drilling fluid would be pumped from the mud
29 system on the exit side (North Work Area) through the drill pipe to the cutter. The fluid
30 would then return up the annulus to tanks on the south side (South Work Area) work
31 platform. The centrifugal transfer pump would send the drilling slurry to the cleaning
32 equipment, where the solids would be separated from the drilling fluid before being
33 pumped back through the drill string to the fly cutter.

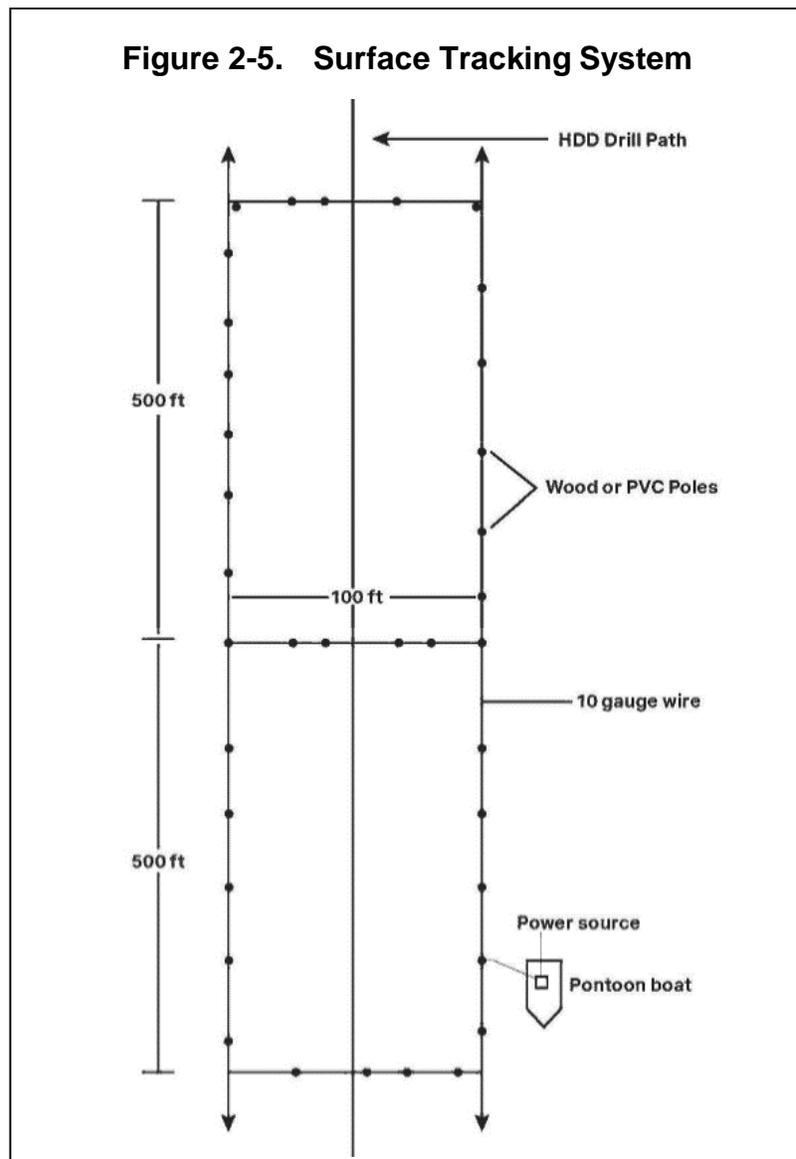
34 After the 16-inch reaming pass, a 12-inch barrel reamer would be connected and pulled
35 from the South Work Area to the North Work Area to condition the borehole. The drilling
36 rig would provide power for pulling and rotation. The exit side (South Work Area) mud
37 system would provide drilling fluid to the reamer.

1 2.2.1.2 Borehole Tracking System

2 For the two pilot holes to follow the designed drill path and properly intersect between
 3 the two work areas, the pilot hole path would need to be tracked. A surface tracking
 4 system would be assembled, consisting of a grid of insulated 10-gauge wire supported
 5 by wood or polyvinyl chloride (PVC) poles over the centerline of the drill path. The width
 6 of the tracking grid would need to match the depth of the drilled borehole; therefore, the
 7 grid would be approximately 100 feet wide for this Project. The grid would be separated
 8 into sections, or coils, spaced out over the length of the drill, and each coil would be
 9 approximately 500 feet long (Figure 2-5).

10 To construct the coils, a
 11 small pontoon boat would be
 12 used to install a grid of
 13 approximately 125 small-
 14 diameter (1- to 2-inch-
 15 diameter) wood or PVC poles
 16 along the drill path. If
 17 necessary, the placement of
 18 the coils could be adjusted to
 19 avoid areas of emergent
 20 vegetation or other
 21 obstructions.

22 The grid would be connected
 23 to a power source, such as a
 24 welding generator, which
 25 would be turned on for about
 26 15 to 30 seconds when
 27 measurements are needed
 28 (about 20 times per day).
 29 When the grid is powered, it
 30 would temporarily generate a
 31 weak, localized magnetic
 32 field, providing accurate
 33 tracking information to the
 34 drill operator, and thereby
 35 ensuring that the drilling
 36 head is on the proper design path.



1 2.2.1.3 Drilling Fluid

2 Directional drilling would require the use of a bentonite clay drilling slurry (drilling mud)
3 to lubricate the drill cutting head and borehole as it is drilled, stabilize the borehole from
4 collapse, and remove drill cuttings. Bentonite is an inert and non-toxic substance, and
5 would be the only additive used during drilling. During drilling, the slurry would be
6 pumped to the cutting head or drill bit and would be recirculated to the entry pits where
7 it would be pumped to a machine (called a reclaimer) that would remove the drill
8 cuttings. The slurry would then be reused in the borehole. After drilling is completed,
9 excess slurry would be removed via vacuum trucks located at both work areas and
10 transported to an appropriately permitted landfill for disposal. Water from the borehole
11 may also enter the entry pit and would be pumped into tanks and disposed in
12 accordance with state and county regulations.

13 Drilling the pilot hole would require drilling mud to be pumped into the borehole under
14 pressure. If cracks or fissures exist in the substrate, drilling mud could move through the
15 cracks and exit at the surface; this is known as “inadvertent return” or “surface
16 expression.” The potential for inadvertent return would be small and was reduced during
17 the borehole design phase using information from previous geotechnical studies that
18 were completed for the Project as well as engineering design methods such as the 20-
19 inch-diameter steel casing proposed at the South Work Area. To ensure a safe and low-
20 impact Project execution, additional precautions would include continuous monitoring of
21 drilling fluid pressures by the driller and having a contingency plan in place to
22 immediately initiate inspections of the drill path for potential inadvertent returns.

23 2.2.1.4 Water Use During Drilling

24 Dutra would provide construction services to CPL and also provide water required for
25 mixing the drilling mud, which would be obtained from the City of Fairfield. The water
26 would be trucked from Fairfield to Dutra’s docks at 415 River Road in Rio Vista and then
27 transported by barge to the South Work Area in Honker Bay. Water transported to the
28 South Work Area would be transferred by a centrifugal pump from the water barge to a
29 15,750-gallon (500-barrel) tank stationed near the mud cleaning system on the mud
30 barge. For the North Work Area, water will be trucked directly from Fairfield to the
31 construction site. Approximately 21,000 gallons of water per day, or approximately
32 800,000 gallons total, would be used for construction.

33 **2.2.2 Pipe String (Backstring) Assembly**

34 The 8-inch-diameter, 7,000-foot-long steel pipe string would be assembled from 200-
35 foot-long pipe sections as shown on Figure 2-6. The 200-foot pipe sections would be
36 assembled at the Dutra Yard in Rio Vista (160 River Road, Figure 1-1) and then
37 transported down the Sacramento River by barge to Honker Bay, where assembly of

1 the full pipe string would take place. Coordination will occur with the California
2 Department of Transportation, as required, to minimize impacts to traffic on River Road
3 as well as on river traffic and operation of the Rio Vista Bridge. The pipeline sections
4 would then be welded together on a splicing barge in Honker Bay (Figure 1-1). As the
5 pipe string is constructed, it would be moved perpendicular to the shore and in line with
6 the borehole. The pipe string would be anchored with up to 35 12-inch-diameter wood
7 piles temporarily installed in the bay using vibratory methods. The piles and pipe string
8 would have lighted buoys attached to keep the pipe string visible to boats that may
9 enter the area (Figure 2-6). The pipe string would remain in position in Honker Bay for
10 up to 2 weeks until it is installed in the drilled hole (pullback). A U.S. Coast Guard Local
11 Notice to Mariners would be posted to alert boaters to the temporary placement of the
12 pipe string in Honker Bay. After welding is complete, the 7,000-foot-long pipe string
13 would be hydrostatically tested to ensure the integrity of all weld points. The new pipe
14 segment would also be hydrostatically tested after installation. Approximately 15,000
15 gallons of potable water from the City of Fairfield would be used for the pre- and post-
16 installation hydrostatic testing. The same water would be used for both tests.

17 **2.2.3 Hydrostatic Testing**

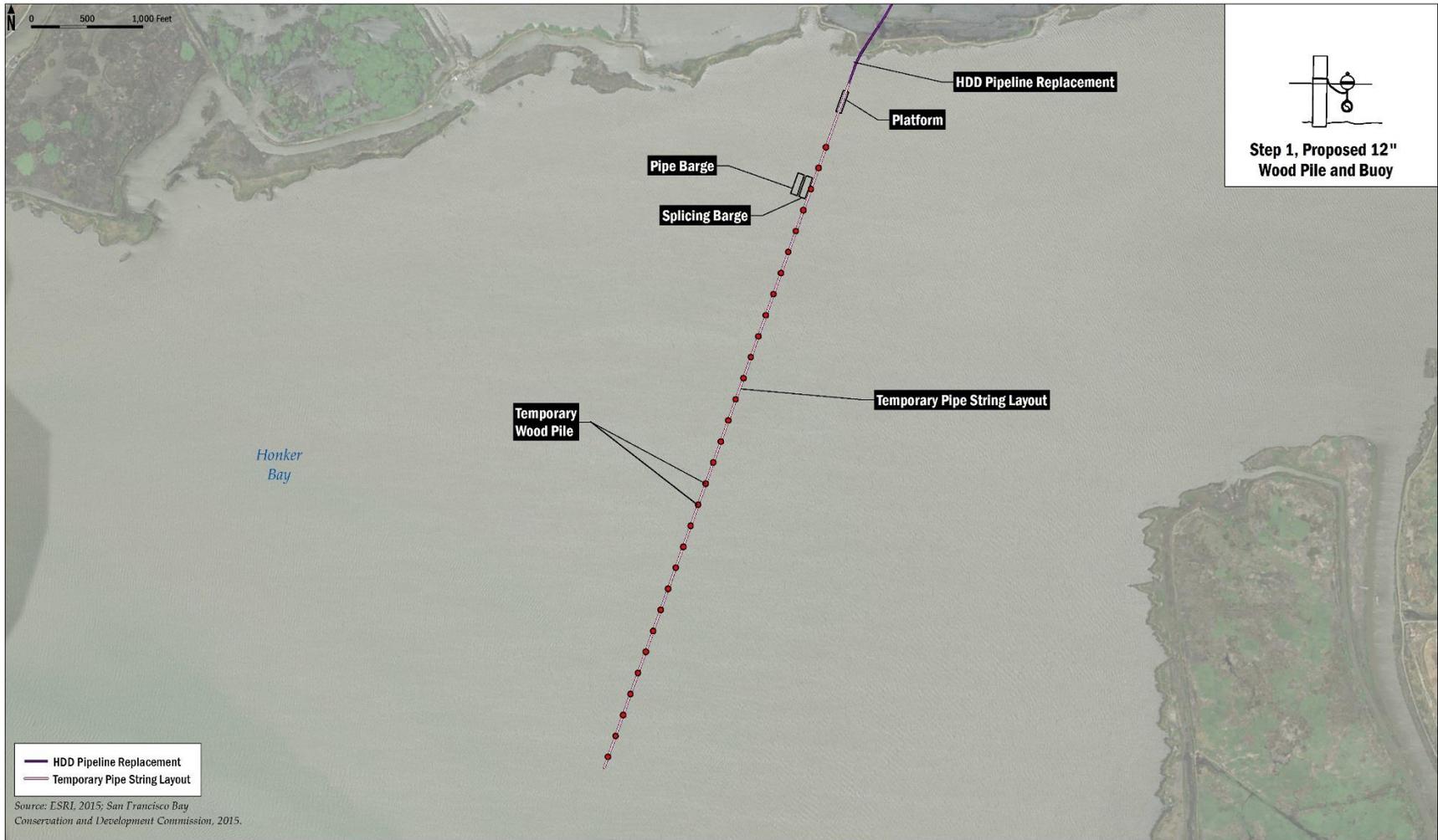
18 Before installation in the ground, the pipe would be tested hydrostatically at a pressure
19 of 1,769 pounds per square inch gauge for 4 continuous hours to ensure that no leaks
20 are in the new pipe. The hydrostatic test would require approximately 15,000 gallons of
21 water. Water used for the hydrostatic test would be obtained from the City of Fairfield
22 (as described above for drilling). After the new pipe is installed in the ground, a second
23 hydrostatic test would be completed (as described above, but for 8 hours) to ensure that
24 the pipe string has maintained its integrity during the pullback. Water used in the first
25 test would be captured and contained on-site to be reused for the second test. After
26 hydrostatic testing is completed, the test water would be contained in storage tanks and
27 tested. The water would then be discharged to the surrounding waterway, in
28 accordance with a permit to be obtained from the Regional Water Quality Control Board.
29 If a permit cannot be obtained, or if the testing indicated that the water contained
30 contaminants in excess of permitted levels, the water would be hauled off site for
31 disposal at a permitted commercial disposal facility.

32 **2.2.4 Pullback**

33 In preparation for the installation of the pipe in the drilled hole (pullback), the new pipe
34 string would be lifted by crane into a cantilevered bend in alignment with the borehole,
35 fed along rollers, and connected to the barrel reamer (previously used to enlarge the
36 borehole) with a swivel connection. It would then be pulled back through the hole using
37 the 750,000-pound drill rig stationed at the North Work Area. The pullback is expected
38 to take 24 hours and would be completed as one continuous process from start to finish.
39 This would be the only night work conducted for the Project.

1

Figure 2-6. Pipe String Assembly



1 **2.2.5 New Pipe Tie-In**

2 The new pipe tie-in refers to connecting the new pipe to the existing Bay Area Products
3 Line (BAPL). At the North Work Area, the HDD equipment would be demobilized from
4 the site. The HDD entry pit would be expanded, as needed, to expose the existing
5 pipeline. The maximum dimensions of the entry pit are expected to be 10 feet by 12 feet
6 by 6 feet deep. Appropriate shoring and trench boxes would be installed in the pit, and
7 1.5-inch drain rock would be placed in the bottom of the pit for workers to have a dry,
8 firm area on which to work. Additionally, dewatering of the pit would be necessary. After
9 the pit is enlarged and shored, the new pipe would be “tied-in” or welded to the existing
10 pipeline. After welding the new pipeline to the existing pipeline, the welds would be x-
11 rayed to inspect the weld points for quality and integrity. After the tie-in is completed, the
12 shoring and rock would be removed and the entry pit would be backfilled with the
13 original material (previously stockpiled on-site for this purpose).

14 At the South Work Area, the existing BAPL line lies on the bottom of Honker Bay. The
15 drilling equipment would be removed from the South Work Area and the work platform
16 would be demobilized (decking would be removed and piles would be pulled from the
17 Honker Bay floor, potentially using a vibratory driver to loosen the piles as they are
18 pulled). The existing BAPL pipeline would then be lifted from the bottom and the tie-in
19 activities would be conducted on a barge. After welding the new line to the existing line,
20 the welds would be x-rayed to inspect for quality and integrity. The newly joined line
21 would be lowered back to the bottom, and the existing concrete mats, removed during
22 Project mobilization, would be placed back over the line.

23 The existing, replaced segment of pipe between the south and north tie-in points would
24 no longer be used by CPL, and would be filled with grout or slurry, capped, and
25 abandoned in place in accordance with existing agreements with the private
26 landowners. Removal of the existing pipeline segment was considered, but the only
27 feasible method for removal of the line would involve open trenching of the marsh over
28 the approximately 1.2-mile pipe segment. This would cause disturbance to a large
29 amount of marsh habitat and was not considered a viable option compared with leaving
30 the existing buried pipe in place.

31 **2.2.6 Demobilization and Site Restoration**

32 After construction activities are completed, all equipment and materials would be
33 removed from the work areas and construction staging areas. All temporary fill used to
34 create the North Work Area, including the geotextile mats, the rock fill, and the filter
35 fabric, would be removed. Approximately 350 cubic yards of drill spoils and 6,300
36 gallons of drilling mud waste would be hauled by barge back to the Dutra Yard for
37 subsequent disposal at an appropriate, permitted disposal facility. The site would be

1 restored to pre-Project conditions based on the recommendations or requirements from
 2 the resource agencies.

3 At the South Work Area, after the tie-ins and pipeline testing are completed, all
 4 temporary structures installed to support drilling, including all barges and vessels, would
 5 be removed. The work platform and its piles, the steel casing, and all piles installed to
 6 support the new pipe string before installation would be removed. No permanent
 7 aboveground structures would remain.

8 **2.3 PROPOSED SCHEDULE**

9 The Grizzly Island Wildlife Area, where the North Work Area is located, has active,
 10 popular, and robust hunting seasons that generate substantial income for CDFW and
 11 the local community. Elk hunting season begins in late July and runs through late
 12 September; waterfowl hunting season begins in October and runs through February.
 13 During these hunting seasons, CDFW restricts access to the Grizzly Island Wildlife
 14 Area. Because of these access restrictions, the only periods available with open and
 15 safe access to the North Work Area would be during spring and early summer months.
 16 Therefore, Project construction within Suisun Marsh is anticipated to start in May and to
 17 be completed in July 2017, with off-site mobilization and demobilization occurring a few
 18 weeks before and after this period. Construction activities are expected to occur at both
 19 work areas 7 days a week, typically from 7 a.m. to 7 p.m. Certain activities, such as
 20 hydrostatic testing and pipe tie-ins, could exceed a 12-hour day, and installation of the
 21 7,000-foot segment of replacement pipe (known as the “pullback”) is anticipated to
 22 include continuous activity for an approximately 24-hour period. The estimated duration
 23 of construction activities is shown in Table 2-1.

Table 2-1. Project Construction Duration

Activity	Duration (days)
Access Improvements and Mobilization (including North Work Area pad and South Work Area platform)	30
Horizontal Directional Drilling (HDD)	38
Pullback	1
Pipe String (Backstring) Assembly (timing is simultaneous with HDD)	29
New Pipe Tie-In	17
Demobilization and Site Restoration	35
Total Duration	120*
Note: *Some activities occur simultaneously.	

1 **2.4 SITE ACCESS**

2 All equipment and work crews transported to the North Work Area would use public
3 highways and local roads and use standard transport vehicles. In the Project area,
4 construction equipment would be transported down Grizzly Island Road and the levee
5 roads to the work site (see Figure 1-2 for access routes). Workers at the North Work
6 Area would drive to Grizzly Island Wildlife Area and park at the hunting control station
7 (Figure 1-2). From there, they would use passenger vans to mobilize to the North Work
8 Area to reduce impacts on the roads in the wildlife area.

9 Improvements to the surfaces of levee roads would be made as needed. Spot
10 improvements would be required along the access routes for the North Work Area and
11 Staging Area 2, as shown in Figure 1-2. The spot improvements would consist of
12 placing 3/4-inch base rock on the surface of the existing gravel and dirt roads as
13 needed to fill potholes and ruts to ensure stability to mobilize and demobilize all heavy
14 equipment. Levee roads would not require widening, and therefore no fill would be
15 placed in wetlands or habitats as a part of these road improvements. Placement of rock
16 to improve the levee road surfaces may be permitted through the RGP-3 permit issued
17 to reclamation districts by the U.S. Army Corps of Engineers' San Francisco District
18 office.

19 Construction materials and equipment for use at the South Work Area would be staged
20 and loaded for transport at the Dutra Yard. Materials would then be transported from the
21 Dutra docks by barge down the Sacramento River and into Honker Bay to the South
22 Work Area platform and barges. The work crew at the South Work Area would leave
23 from the McAvoy Marina in Bay Point (Figure 1-1) and would be transported by a crew
24 boat to the work platform and barges.

25 During initial equipment mobilization, approximately 30 truck trips would occur over a 6-
26 day period (five trucks per day) via public roads to Grizzly Island Road. Because the site
27 is not accessible by the public, traffic control is not anticipated for the Project. The
28 staging areas, accessible using existing paved, graveled, and dirt roads, are on
29 privately owned land, accessible only through locked gates. Boat traffic is not expected
30 in the Project area because it is not near the shipping lanes.

31 **2.5 EQUIPMENT, WORKFORCE, AND CONSTRUCTION HOURS**

32 Construction would include the following equipment: diesel-powered drill rigs, control
33 units, mud cleaner systems, de-silters, generators, forklifts, backhoes, a pipe trailer,
34 cranes, supply trailers, de-watering tanks and pumps, a track excavator, and
35 interlocking all-weather mats.

1 Construction would require about 60 workers, distributed between the North Work Area,
2 the South Work Area barges, and the Dutra Yard for fabrication of the pipe string.
3 Drilling of the HDD borehole would require about 50 workers, with about 23 workers in
4 the North Work Area and 27 in the South Work Area. Separate work crews would work
5 simultaneously at the North and South Work Areas.

6 Construction activities are expected to occur at both work areas 7 days a week, typically
7 from 7 a.m. to 7 p.m. Certain activities, such as hydrostatic testing and pipe tie-ins,
8 could exceed a 12-hour day, and the installation of the 7,000-foot replacement pipe
9 segment is anticipated to include continuous activity for an approximately 24-hour
10 period. Portable temporary lighting would be used during construction when required,
11 and it would be shielded and directed downward toward the work area to minimize light
12 trespass to adjacent areas.

13 **2.6 CLIMATE CHANGE AND SEA-LEVEL RISE**

14 The section of pipeline that the Project will replace traverses upland, intertidal, and
15 submerged lands. Sea-level rise and other climate-change-related impacts such as
16 flooding, erosion and scour, and sediment pulse events associated with heavier and
17 more frequent winter storms are likely to affect this tidally-influenced area and may
18 change the land classification types that the pipeline intersects. The sea-level rise
19 projections for the Bay/Delta region range from 0.1 to 1 foot by 2030, 0.4 to 2 feet by
20 2050, and 1.4 to 5.5 feet by 2100 (National Research Council 2012).

21 Given these projections, it is likely that there will be overall greater total water levels
22 permanently over the Project location as well as temporary increases in total water
23 levels due to flooding and storm events. The areas that are now intertidal may become
24 submerged and the upland marsh may become intertidal given the sea-level
25 projections. The marsh edge upland of the mudflats may erode more rapidly due to sea-
26 level rise and the accompanying increase in wave energy associated with stronger
27 storms and greater total water levels (Veloz 2013; Beagle et al. 2015). The contours
28 and structure of tidal flats and upland salt marshes throughout the San Francisco Bay
29 area are always in flux due to the nature of sediment supply, water levels, wave action,
30 and currents. Sediment accretion has the potential to ameliorate the magnitude of sea-
31 level rise if it can keep pace with the rate of total water level change, as some evidence
32 suggests occurs now (Callaway et al. 2012). However, as sea-level rise accelerates
33 throughout the century due to rapid ice sheet melt, sediment accretion is less likely to
34 continue to offset the impacts of sea-level rise around San Francisco Bay. As a result,
35 the pipeline may be vulnerable in the future to the impacts of these anticipated changes
36 in the Project area.

3.0 ENVIRONMENTAL CHECKLIST AND ANALYSIS

This section contains the Initial Study (IS) that was completed for the proposed Chevron Pipe Line Company (CPL or Applicant) Mallard Farms Pipeline Replacement Project (Project) in accordance with the requirements of the California Environmental Quality Act (CEQA). The IS identifies site-specific conditions and impacts, evaluates their potential significance, and discusses ways to avoid or lessen impacts that are potentially significant. The information, analysis, and conclusions included in the IS provide the basis for determining the appropriate document needed to comply with CEQA. For the Project, based on the analysis and information contained herein, California State Lands Commission (CSLC) staff have found that the IS shows that there is substantial evidence that the Project may have a significant effect on the environment, but revisions to the Project would avoid or mitigate the effects to a point where clearly no significant effect on the environment would occur. As a result, the CSLC has concluded that a Mitigated Negative Declaration (MND) is the appropriate CEQA document for the Project.

The evaluation of environmental impacts provided in this IS is based in part on the impact questions contained in Appendix G of the State CEQA Guidelines; these questions, which are included in an impact assessment matrix for each environmental category (Aesthetics, Agriculture/Forest Resources, Air Quality, Biological Resources, etc.), are “intended to encourage thoughtful assessment of impacts.” Each question is followed by a check-marked box with column headings that are defined below.

- **Potentially Significant Impact.** This column is checked if there is substantial evidence that a Project-related environmental effect may be significant. If there are one or more “Potentially Significant Impacts,” a Project Environmental Impact Report (EIR) would be prepared.
- **Less than Significant with Mitigation.** This column is checked when the Project may result in a significant environmental impact, but the incorporation of identified Project revisions or mitigation measures (MMs) would reduce the identified effect(s) to a less-than-significant level.
- **Less-than-Significant Impact.** This column is checked when the Project would not result in any significant effects. The Project’s impact is less than significant even without the incorporation of Project-specific MMs.
- **No Impact.** This column is checked when the Project would not result in any impact in the category or when the category does not apply.

The environmental factors checked below (Table 3-1) would be potentially affected by this Project; a checked box indicates that at least one impact would be a “Potentially Significant Impact” except that the Applicant has agreed to Project revisions, including implementation of MMs, to reduce the impacts to “Less than Significant with Mitigation.”

Table 3-1. Environmental Issues and Potentially Significant Impacts

<input checked="" type="checkbox"/> Aesthetics	<input type="checkbox"/> Agriculture and Forest Resources	<input type="checkbox"/> Air Quality
<input checked="" type="checkbox"/> Biological Resources (Terrestrial and Marine)	<input checked="" type="checkbox"/> Cultural and Paleontological Resources	<input type="checkbox"/> Geology and Soils
<input type="checkbox"/> Greenhouse Gas Emissions	<input checked="" type="checkbox"/> Hazards and Hazardous Materials	<input checked="" type="checkbox"/> Hydrology and Water Quality
<input checked="" type="checkbox"/> Land Use and Planning	<input type="checkbox"/> Mineral Resources	<input type="checkbox"/> Noise
<input type="checkbox"/> Population and Housing	<input type="checkbox"/> Public Services	<input type="checkbox"/> Recreation
<input type="checkbox"/> Transportation/Traffic	<input type="checkbox"/> Utilities and Service Systems	
<input checked="" type="checkbox"/> Mandatory Findings of Significance		
<input type="checkbox"/> Other Major Areas of Concern: Environmental Justice		

1 Detailed descriptions and analyses of impacts from Project activities and the basis for
 2 their significance determinations are provided for each environmental factor on the
 3 following pages, beginning with Section 3.1, Aesthetics. Relevant laws, regulations, and
 4 policies potentially applicable to the Project are listed in the Regulatory Setting for each
 5 environmental factor analyzed in this IS.

6 AGENCY DETERMINATION

7 Based on the environmental impact analysis provided by this Initial Study:

- I find that the proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the Project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

 Signature
 Kelly Keen, Environmental Scientist
 California State Lands Commission

 Date

1 **3.1 AESTHETICS**

AESTHETICS – Would the Project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2 **3.1.1 Environmental Setting**

3 The Project is located within Suisun Marsh, north of Honker Bay, in Solano County and
 4 extends into Honker Bay approximately 7,000 feet from the shore (Figure 1-1). It is also
 5 within the Grizzly Island Wildlife Area. The nearest communities are Bay Point and
 6 Pittsburg to the south and Suisun City and Fairfield to the north. Primary access to
 7 Grizzly Island is from Suisun City from the north via Grizzly Island Road.

8 Suisun Marsh is the largest contiguous brackish marsh remaining on the west coast of
 9 North America and is a critical part of the San Francisco Bay-Delta estuary ecosystem,
 10 serving as a resting and feeding ground for tens of thousands of wintering and migrating
 11 waterfowl and providing habitat for more than 221 species of birds. Encompassing
 12 116,000 acres, the marsh includes 52,000 acres of managed wetlands, 30,000 acres of
 13 bays and sloughs, 27,700 acres of uplands, and 6,300 acres of tidal wetlands. It is also
 14 home to public waterfowl hunting areas and 158 private duck hunting clubs.

15 Suisun Marsh is flat and formed by the confluence of the Sacramento and San Joaquin
 16 Rivers. Sloughs within the marsh form dendritic channel patterns that wind and branch
 17 through the low-lying landscape. Many of these channels are contained by the low
 18 levees that have contributed to maintaining historical channel patterns. A few human-
 19 made channels have been created to allow access to areas of the marsh. The marsh's
 20 large open space and proximity to urban areas makes it suited for wildlife viewing,
 21 hiking, canoeing, large mammal and duck hunting, and other recreation opportunities.
 22 As a result, the area is used extensively by the public for recreational use throughout
 23 the year.

1 **3.1.2 Regulatory Setting**

2 Federal and state laws and regulations pertaining to aesthetics and relevant to the
3 Project are identified in Appendix A. At the local level, the Scenic Resources section of
4 the Suisun Marsh Policy Addendum in the Solano County General Plan includes
5 policies regarding marshlands (Solano County 2008a), including Policy 4, which may be
6 applicable to the Project: “Since such a flat and expansive natural environment tends to
7 exaggerate vertical elements, undergrounding of utility lines is highly recommended.”

8 **3.1.3 Impact Analysis**

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

10 **Less than Significant Impact.** The Project would create only short-term, temporary
11 visual impacts associated with construction activities. No visual impacts are associated
12 with long-term pipeline operations. Temporary construction activities include mobilizing
13 construction equipment, drilling activities, and assembling and installing pipe sections,
14 followed by de-mobilizing the construction equipment and site restoration. Construction
15 crews working in the North Work Area would be staged from a location on Grizzly Island
16 Road. Workers would arrive in their private vehicles at a designated parking area on
17 Grizzly Island and then shuttled via multi-passenger vans to the work area.

18 Barges would convey platform equipment, pilings, pipes, water, and slurry on the
19 Sacramento River, Montezuma Slough, and Suisun Bay. The North Work Area in
20 Suisun Marsh and the South Work Area in Honker Bay would contain equipment that
21 would be visible during the approximately 3-month construction period. At the end of
22 construction, all equipment would be removed and the sites would be restored. Since
23 the only visual impacts would be associated with construction, which would be short
24 term and temporary, the Project would have less than significant impacts on scenic
25 vistas.

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

28 **No Impact.** The Project site is not within view of a State Scenic Highway. The nearest
29 designated scenic highways are State Highway 37 to the west, State Highway 24 to the
30 south, and State Highway 4 to the east. These scenic highways are at least 10 miles
31 from the Project site and no scenic resources would be damaged by the Project.
32 Therefore, there would be no impacts to scenic resources.

1 ***c) Substantially degrade the existing visual character or quality of the site and its***
2 ***surroundings?***

3 **Less than Significant Impact.** Project components, as described previously in this
4 document, would temporarily degrade the visual character and quality of the site and its
5 surroundings for a period of approximately 3 months, from May to July 2017.
6 Degradation of the visual quality at the Project site would be temporary, and the Project
7 site would be restored to pre-Project conditions upon Project completion. Therefore, the
8 Project would have a less than significant impact on the existing visual character and
9 quality of the site and its surroundings.

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

12 **Less than Significant with Mitigation.** The majority of Project-related construction
13 would take place during daylight hours (between 7:00 a.m. and 7:00 p.m.) during late
14 spring and early summer; however, pulling the assembled pipe segment through the
15 drilled hole needs to be accomplished during one continuous operation, which is
16 anticipated to take approximately 24 hours. This would be the only night work
17 conducted for the Project, and it would require the use of portable temporary lighting for
18 one or two nights during Project construction. The nearest residential housing to the
19 Project site is located in the community of Bay Point, approximately 3.5 miles south of
20 the South Work Area and Honker Bay in Contra Costa County.

21 To ensure that potential impacts associated with light or glare are avoided or mitigated
22 to less than significant, the following MM would be implemented:

23 **MM AES-1: Night-Lighting Spillage Minimization.** Night-lighting required during
24 pipe pullback activity shall be shielded and directed downward toward the work
25 area to minimize light trespass to adjacent areas.

26 **3.1.4 Mitigation Summary**

27 Implementation of the following MM would reduce the potential for Project-related
28 impacts to Aesthetics to less than significant.

- 29
 - MM AES-1: Night-Lighting Spillage Minimization

1 **3.2 AGRICULTURE AND FOREST RESOURCES**

AGRICULTURE AND FOREST RESOURCES³ – Would the Project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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 Natural Resources Agency, to non- agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Pub. Resources Code, § 12220, subd. (g)), timberland (as defined by Pub. Resources Code, § 4526), or timberland zoned Timberland Production (as defined by Gov. Code, § 51104, subd. (g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

2 **3.2.1 Environmental Setting**

3 The Project is located within Suisun Marsh, north of Honker Bay, in Solano County and
 4 extends into Honker Bay approximately 7,000 feet from the shore (Figure 1-1). The
 5 onshore portion of the Project would occur on a mix of private lands, state lands, and
 6 the Grizzly Island Wildlife Area. The Grizzly Island Wildlife Area is under the jurisdiction
 7 of the California Department of Fish and Wildlife (CDFW) and managed by the Suisun
 8 Marsh Preservation Agreement. Suisun Marsh is part of the San Francisco Bay tidal
 9 estuary and is the largest contiguous brackish marsh on the West Coast. Land within
 10 areas traversed by the Project consists primarily of natural lands managed for wildlife,

³ In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the State’s inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.

1 hunting, and other recreational uses. No agricultural or forest resources are present in
2 the Project area.

3 **3.2.2 Regulatory Setting**

4 Federal and state laws and regulations pertaining to agriculture and forest resources
5 and relevant to the Project are identified in Appendix A. At the local level, there are no
6 goals, policies, and/or regulations applicable to this issue area for the Project due to its
7 location and the nature of the activity.

8 **3.2.3 Impact Analysis**

9 *a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide*
10 *Importance (Farmland), as shown on the maps prepared pursuant to the*
11 *Farmland Mapping and Monitoring Program of the California Natural*
12 *Resources Agency, to non-agricultural use?*

13 *b) Conflict with existing zoning for agricultural use, or a Williamson Act*
14 *contract?*

15 *c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined*
16 *in Pub. Resources Code, § 12220, subd. (g)), timberland (as defined by Pub.*
17 *Resources Code, § 4526), or timberland zoned Timberland Production (as*
18 *defined by Gov. Code, § 51104, subd. (g))?*

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

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

23 **a) to e) No Impact.** There are no farm or forest lands located in the vicinity of the
24 Project site; therefore, the Project would not impact agricultural or forest lands.

25 **3.2.4 Mitigation Summary**

26 The Project would have no impacts to Agriculture and Forest Resources; therefore, no
27 mitigation is required.

1 **3.3 AIR QUALITY**

AIR QUALITY – Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the Project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

2 **3.3.1 Environmental Setting**

3 3.3.1.1 Topography, Meteorology, and Climate

4 The Project site is located in the southwestern portion of Solano County, which is part of
 5 the San Francisco Bay Area Air Basin (SFBAAB) and Carquinez Strait climatological
 6 sub-region. The SFBAAB is comprised of complex terrain types, including coastal
 7 mountain ranges, inland valleys, and the San Francisco Bay. The SFBAAB is generally
 8 bordered on the west by the Pacific Ocean, on the north by the Coast Ranges, and on
 9 the east and south by the Diablo Range. Meteorological conditions in the SFBAAB are
 10 warm and mainly dry in summer, and mild and moderately wet in winter. Marine air has
 11 a moderating effect on the climate throughout much of the year. Winds flow through the
 12 Golden Gate from the Pacific Ocean, but direct flow into eastern Alameda County is
 13 impeded by the East Bay hills. Marine air is mostly blocked from the area until late
 14 afternoons or on days when deep marine inversions develop with strong onshore flows.
 15 The Carquinez Strait climatological sub-region stretches from Rodeo in the southwest
 16 and Vallejo in the northwest to Fairfield on the northeast and Brentwood on the
 17 southeast. Prevailing winds are from the west in the Carquinez Strait, particularly during
 18 the summer when high pressure offshore and thermal low pressure in the Central Valley
 19 draws marine air eastward through the Carquinez Strait. During the winter, easterly flow
 20 through the strait is more common when the pressure gradient reverses.

1 3.3.1.2 Local Air Quality Conditions

2 The determination of whether a region’s air quality is healthful or unhealthful is made by
3 comparing contaminant levels in ambient air samples to California Ambient Air Quality
4 Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS). Both the
5 California Air Resources Board (CARB) and U.S. Environmental Protection Agency
6 (USEPA) ambient air concentrations are monitored throughout the SFBAAB to
7 designate an area’s attainment status with respect to the CAAQS and NAAQS,
8 respectively, for criteria air pollutants. The purpose of these designations is to identify
9 areas with air quality problems and thereby initiate planning efforts for improvement.
10 The three basic designation categories are “nonattainment,” “attainment,” and
11 “unclassified” (the latter is used in an area that cannot be classified on the basis of
12 available information as meeting or not meeting the standards). Table 3.3-1 lists recent
13 attainment designations with respect to the SFBAAB. With respect to the CAAQS, the
14 SFBAAB is designated as a nonattainment area for ozone, particulate matter less than
15 10 micrometers (PM₁₀), and particulate matter less than 2.5 micrometers (PM_{2.5}), and as
16 an attainment or unclassified area for all other pollutants. With respect to the NAAQS,
17 the SFBAAB is designated as a marginal nonattainment area for ozone and PM_{2.5}, and
18 as an attainment or unclassified area for all other pollutants.

19 The Bay Area Air Quality Management District (BAAQMD) maintains multiple air quality
20 monitoring stations that continually measure the ambient concentrations of major air
21 pollutants throughout the Bay Area. Within the Carquinez Strait sub-region, the closest
22 such monitoring station to the Project site is Bethel Island Road, about 14 miles to the
23 southeast. Table 3.3-2 summarizes ambient air quality data recorded at this station for
24 the past 5 years. As shown, only concentrations for ozone and 24-hour PM_{2.5} exceeded
25 standards in one or two occasions during this period. This sub-region contains a variety
26 of industrial air pollution sources, including but not limited to chemical and petroleum
27 operations. The sub-region is also traversed by major freeways, including Interstate 80
28 (I-80). Traffic and congestion, and the motor vehicle emissions they generate, are
29 increasing due to population increase in the San Francisco Bay Area.

30 3.3.1.3 Sensitive Receptors

31 Some receptors are considered more susceptible to potential health impacts from poor
32 air quality than others. The reasons for greater than average sensitivity include pre-
33 existing health problems, proximity to emissions source, or duration of exposure to air
34 pollutants. The BAAQMD identifies a sensitive receptor as “facilities or land uses that
35 include members of the population that are particularly sensitive to the effects of air
36 pollutants, such as children, the elderly, and people with illnesses. Examples include
37 schools, hospitals and residential areas.” Recreational uses may also be considered
38 sensitive due to the greater exposure to ambient air quality conditions because people
39 engaging in vigorous exercise have higher breathing rates.

Table 3.3-1. NAAQS, CAAQS, and SFBAAB Attainment Status

Pollutant	Averaging Time	California Standards ¹		National Standards ²	
		Concentration	Status	Primary	Status
Ozone (O ₃)	1 Hour	0.09 ppm (180 µg/m ³)	Nonattainment	—	—
	8 Hours	0.070 ppm (137 µg/m ³)	Nonattainment ⁹	0.070 ppm (147 µg/m ³)	Nonattainment ⁴
Respirable Particulate Matter (PM ₁₀)	24 Hours	50 µg/m ³	Nonattainment	150 µg/m ³	Unclassified
	AAM	20 µg/m ³	Nonattainment ⁷	—	—
Fine Particulate Matter (PM _{2.5})	24 Hours	—	—	35 µg/m ³ ¹⁰	Nonattainment
	AAM	12 µg/m ³	Nonattainment ⁷	12.0 µg/m ³ ¹⁵	Attainment/ Unclassified
Carbon Monoxide (CO)	8 Hours	9.0 ppm (10 mg/m ³)	Attainment	9 ppm (10 mg/m ³)	Attainment ⁶
	1 Hour	20 ppm (23 mg/m ³)	Attainment	35 ppm (40 mg/m ³)	Attainment
Nitrogen Dioxide (NO ₂) ⁷	AAM	0.030 ppm (57 µg/m ³)	Attainment	0.053 ppm (100 µg/m ³)	Attainment
	1 Hour	0.18 ppm (339 µg/m ³)	Attainment	0.100 ppm (188 µg/m ³) ¹¹	Unclassified
Sulfur Dioxide (SO ₂) ¹²	24 Hours	0.04 ppm (105 µg/m ³)	Attainment	0.14 ppm (365 µg/m ³)	Attainment
	1 Hour	0.25 ppm (655 µg/m ³)	Attainment	0.075 ppm (196 µg/m ³)	Attainment
	AAM	—	—	0.030 ppm (80 µg/m ³)	Attainment
Lead (Pb) ¹³	30-Day Average	1.5 µg/m ³	Attainment	—	—
	Calendar Quarter	—	—	1.5 µg/m ³	Attainment
	Rolling 3-Month Average ¹⁴	—	—	0.15 µg/m ³	Attainment ¹⁴
Visibility-Reducing Particles (VRP) ¹¹	8 Hours	See footnote ⁸	Unclassified	No national standards	
Sulfates	24 Hours	25 µg/m ³	Attainment		
Hydrogen Sulfide (H ₂ S)	1 Hour	0.03 ppm (42 µg/m ³)	Unclassified		
Vinyl Chloride (C ₂ H ₃ Cl)	24 Hours	0.010 ppm (26 µg/m ³)	No information available		

Source: Bay Area Air Quality Management District (BAAQMD) 2015.

Acronyms: mg/m³ = milligrams per cubic meter; ppb = parts per billion; ppm = parts per million; µg/m³ = micrograms per cubic meter; AAM = Annual Arithmetic Mean; CARB = California Air Resources Board; NAAQS = National Ambient Air Quality Standards; SIP = State Implementation Plan; USEPA = U.S. Environmental Protection Agency.

Table 3.3-1. NAAQS, CAAQS, and SFBAAB Attainment Status

Pollutant	Averaging Time	California Standards ¹		National Standards ²	
		Concentration	Status	Primary	Status
Notes:					
<p>¹ California standards for O₃, CO (except Lake Tahoe), SO₂ (1-hour and 24-hour), NO₂, suspended particulate matter - PM₁₀, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, lead, H₂S and C₂H₃Cl are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for lead and PM₁₀ annual standard), then some measurements may be excluded. In particular, measurements are excluded that CARB determines would occur less than once per year on the average.</p> <p>² National standards shown are the "primary standards" designed to protect public health. National standards other than for O₃, particulates and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent 3-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour O₃ standard is attained when the 3-year average of the 4th highest daily concentrations is 0.075 ppm (75 ppb) or less. The 24-hour PM₁₀ standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 µg/m³. The 24-hour PM_{2.5} standard is attained when the 3-year average of 98th percentiles is less than 35 µg/m³. Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM₁₀ is met if the 3-year average falls below the standard at every site. The annual PM_{2.5} standard is met if the 3-year average of annual averages spatially-averaged across officially designed clusters of sites falls below the standard.</p> <p>³ National air quality standards are set by the USEPA at levels determined to be protective of public health with an adequate margin of safety.</p> <p>⁴ Final designations effective July 20, 2012.</p> <p>⁵ The national 1-hour O₃ standard was revoked by the USEPA on June 15, 2005.</p> <p>⁶ In April 1998, the Bay Area was redesignated to attainment for the national 8-hour CO standard.</p> <p>⁷ In June 2002, CARB established new annual standards for PM_{2.5} and PM₁₀.</p> <p>⁸ Statewide VRP Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.</p> <p>⁹ The 8-hour California ozone standard was approved by CARB in 2005 effective May 17, 2006.</p> <p>¹⁰ On January 9, 2013, the USEPA issued a final rule to determine that the Bay Area attains the 24-hour PM_{2.5} national standard. This USEPA rule suspends key SIP requirements as long as monitoring data continue to show that the Bay Area attains the standard. Despite this USEPA action, the Bay Area would continue to be designated as "non-attainment" for the national 24-hour PM_{2.5} standard until such time as the Air District submits a "redesignation request" and a "maintenance plan" to the USEPA, and the USEPA approves the proposed redesignation.</p> <p>¹¹ To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010).</p> <p>¹² On June 2, 2010, the USEPA established a new 1-hour SO₂ standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The existing 0.030 ppm annual and 0.14 ppm 24-hour SO₂ NAAQS however must continue to be used until 1 year following the USEPA's initial designations of the new 1-hour SO₂ NAAQS.</p> <p>¹³ CARB has identified lead and C₂H₃Cl as "toxic air contaminants" with no threshold level of exposure below which there are no adverse health effects determined.</p> <p>¹⁴ National lead standard, rolling 3-month average: Final designations effective December 31, 2011.</p> <p>¹⁵ In 2012, the USEPA strengthened the annual PM_{2.5} NAAQS from 15.0 to 12.0 µg/m³. In December 2014, the USEPA issued final area designations for the 2012 primary annual PM_{2.5} NAAQS. Areas designated "unclassifiable/attainment" must continue to take steps to prevent their air quality from deteriorating to unhealthy levels. The effective date of this standard is April 15, 2015.</p>					

Table 3.3-2. Criteria Air Pollutants Data Summary (Bethel Island Road Station)

Pollutant	Averaging Time	Applicable Standard	2010	2011	2012	2013	2014
Ozone (O ₃)	1 Hour	Maximum Concentration (ppm)	0.106	0.091	0.098	0.082	0.092
		Days > CAAQS (0.09 ppm)	3	0	1	0	0
	8 Hours	Maximum Concentration (ppm)	0.086	0.078	0.087	0.075	0.071
		Days > NAAQS (0.075 ppm)	4	2	2	0	0
		Days > CAAQS (0.07 ppm)	7	4	4	1	1
Particulate Matter (PM ₁₀)	24 Hours	Maximum Concentration (µg/m ³)	69.6	49.5	52.3	50.7	61.3
		Days > CAAQS (50 µg/m ³)	1	0	1	1	1
		Days > NAAQS (150 µg/m ³)	0	0	0	0	0
	Annual	State Annual Average (20 µg/m ³)	18.7	17.9	14.1	n/a	n/a
Carbon Monoxide (CO) ¹	1 Hour	Maximum Concentration (ppm)	2.9	3.0	2.8	2.8	2.5
		Days > CAAQS (20 ppm)	0	0	0	0	0
		Days > NAAQS (35 ppm)	0	0	0	0	0
	8 Hours	Maximum Concentration (ppm)	0.83	0.95	0.89	n/a	n/a
		Days > CAAQS (9.0 ppm)	0	0	0	n/a	n/a
Nitrogen Dioxide (NO ₂)	1 Hour	Maximum Concentration (ppm)	0.032	0.036	0.032	0.033	0.034
		Days > CAAQS (0.18 ppm)	0	0	0	0	0
	Annual	Arithmetic Average (0.053 ppm)	0.006	0.006	0.006	n/a	0.005

Source: California Air Resources Board (CARB) 2016 and U.S. Environmental Protection Agency (USEPA) 2016.

Acronyms: AAQS = California Ambient Air Quality Standards; µg/m³ = micrograms per cubic meter; NAAQS = National Ambient Air Quality Standards; ppm = parts per million; n/a = sufficient data not available to determine the value.

Notes:

¹ 8-hour CO averages and related statistics are available at Bethel Island Road between 1981 and 2012. 1-hour CO monitored data are from USEPA AirData Website:

www.epa.gov/airdata/ad_rep_mon.html.

* Estimated/measured numbers of recorded concentrations above NAAQS are shown in **bold**.

* Ambient data for SO₂ and airborne lead are not included in this table since the Basin is currently in compliance with state and federal standards for these pollutants.

1 The land surrounding the Project site consists primarily of natural lands managed for
 2 wildlife, hunting, and similar uses. The nearest residential sensitive receptors are
 3 located in the Contra Costa County community of Bay Point, located approximately 3.5
 4 miles south of the South Work Area and Honker Bay. The closest school is Shore Acres
 5 Elementary School, which is also located in Bay Point, approximately 4 miles south of
 6 the Project’s South Work Area. The nearest medical facility is Concentra Medical Center
 7 located in Pittsburg, approximately 4 miles southeast of the Project site.

8 **3.3.2 Regulatory Setting**

9 Federal and state laws and regulations pertaining to air quality and relevant to the
 10 Project are identified in Appendix A.

1 3.3.2.1 Bay Area Air Quality Management District

2 At the regional level, the BAAQMD has jurisdiction over the nine-county SFBAAB and is
3 responsible for attaining and maintaining air quality in the SFBAAB within federal and
4 state air quality standards, as established by the Federal Clean Air Act (CAA) and
5 California Clean Air Act (CCAA), respectively. The BAAQMD has the responsibility to
6 monitor ambient air pollutant levels throughout the SFBAAB and to develop and
7 implement strategies to attain applicable federal and state standards. The BAAQMD
8 (2010a) adopted the most recent air quality plan, the 2010 Clean Air Plan, on
9 September 15, 2010. The 2010 Clean Air Plan serves to:

- 10 • Update the Bay Area 2005 Ozone Strategy in accordance with the requirements
11 of the CCAA to implement all feasible measures to reduce ozone;
- 12 • Provide a control strategy to reduce ozone, particulate matter, air toxics, and
13 GHGs in a single, integrated plan; and
- 14 • Establish emission-control measures to be adopted or implemented.

15 The 2010 Clean Air Plan contains the following primary goals:

- 16 • Attain air quality standards;
- 17 • Reduce population exposure and protect public health in the SFBAAB; and
- 18 • Reduce GHG emissions and protect the climate.

19 The 2010 Clean Air Plan represents the most current applicable air quality plan for the
20 SFBAAB. Consistency with this plan is the basis for determining whether the Project
21 would conflict with or obstruct the implementation of air quality plans.

22 BAAQMD (2010b) developed and adopted quantitative thresholds of significance for
23 their CEQA guidelines in 2010 based on projected regional growth and development;
24 however, the agency, following a legal challenge,⁴ currently recommends that lead
25 agencies independently determine appropriate air quality thresholds of significance
26 based on substantial evidence in the record. The 2010 thresholds included in BAAQMD
27 (2011) are used in this analysis based on the following independent determination.

⁴ BAAQMD's adoption of the 2010 thresholds of significance was challenged, resulting in a court-ordered ruling issued March 5, 2012, in California Building Industry Association v. BAAQMD, Alameda County Superior Court Case No. RGI0548693. BAAQMD (2012) subsequently released updated guidelines with references to CEQA thresholds removed. BAAQMD later appealed the ruling, and the judgment was reversed on August 13, 2013, by the State Court of Appeal, First Appellate District. The Court of Appeal's decision was appealed to the California Supreme Court, which granted limited review of a portion of the California Building Industry Association's original claims. The scope of the review was limited to the question of whether or not CEQA requires an analysis of how existing environmental conditions would impact future users of a proposed project. A decision issued on December 17, 2015, stated that CEQA does not generally require an agency to consider these effects.

- 1 • BAAQMD released the “Proposed Thresholds of Significance” in 2009, which
- 2 listed the proposed thresholds for criteria pollutants, GHGs, community risk and
- 3 hazards, and odors. BAAQMD researched existing and projected sources of air
- 4 quality contaminants and designed the 2010 thresholds to comply with state and
- 5 federal standards (see Table 3.3-4).
- 6 • The use of the criteria pollutant thresholds for the purposes of this Project are
- 7 supported by the fact that the thresholds were developed through a quantitative
- 8 examination of the efficacy of fugitive dust MMs and a quantitative examination of
- 9 statewide non-attainment emissions.
- 10 • Based on the substantial evidence described above, the CSLC concludes that
- 11 BAAQMD’s analysis of the level at which a pollutant would potentially
- 12 significantly affect air quality is scientifically sound, and CSLC will utilize the
- 13 thresholds for review of the Project.

Table 3.3-3. Criteria Air Pollutant and Health Risk Significance Thresholds

Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (pounds/day)	Average Daily Emissions (pounds/day)	Maximum Annual Emissions (tons/year)
ROG	54	54	10
NOx	54	54	10
PM ₁₀	82 (exhaust)	82	15
PM _{2.5}	54 (exhaust)	54	10
Fugitive Dust	Construction Dust Ordinance or other BMPs	Not Applicable	
Risk and Hazards for new sources and receptors (Individual Project)	Same as Operational Thresholds	Compliance with Qualified Community Risk Reduction Plan OR Increased cancer risk of > 10.0 in a million Increased non-cancer risk of > 1.0 Hazard Index (Chronic or Acute) Ambient PM _{2.5} increase: > 0.3 µg/m ³ annual average	
Risk and Hazards for new sources and receptors (Cumulative Threshold)	Same as Operational Thresholds	Compliance with Qualified Community Risk Reduction Plan OR Cancer: > 100 in a million (from all local sources) Non-cancer: > 10.0 Hazard Index (from all local sources) (Chronic) PM _{2.5} : > 0.8 µg/m ³ annual average (from all local sources)	
Acronyms: µg/m ³ = micrograms per cubic meter; BMP = Best Management Practice; NO _x = oxides of nitrogen; PM ₁₀ = particulate matter with aerodynamic diameter less than 10 microns; PM _{2.5} = particulate matter with aerodynamic diameter less than 2.5 micrometers; ROG = reactive organic gases.			

14 **Criteria Air Pollutants**

15 In accordance with the State and Federal CAAs, air pollutant standards are identified for

16 six criteria air pollutants: ozone, CO, PM, nitrogen dioxide (NO₂), sulfur dioxide (SO₂),

17 and lead. These pollutants are termed criteria air pollutants because they are regulated

18 by developing specific criteria based on public health and welfare as the basis for

1 setting permissible levels. In general, the SFBAAB experiences low concentrations of
2 most pollutants when compared to federal or state standards. The SFBAAB is
3 designated as either in attainment or unclassified for most criteria pollutants with the
4 exception of ozone, PM_{2.5}, and PM₁₀, for which these pollutants are designated as non-
5 attainment for either state or federal standards (see Table 3.3-1, above).

6 Regional air pollution is largely a cumulative impact in that no single project is sufficient
7 in size to, by itself, result in non-attainment of air quality standards. Instead, a project's
8 individual emissions contribute to existing cumulative air quality impacts. If a project's
9 incremental contribution to cumulative air quality impacts is considerable, then the
10 project's impact on air quality would be considered significant.

11 Land use projects may contribute to regional criteria air pollutants during project
12 construction and operation. Table 3.3-3 identifies air quality significance thresholds
13 based on the BAAQMD's CEQA Air Quality Guidelines. Projects that would result in
14 criteria air pollutant emissions below these thresholds would not violate an air quality
15 standard, contribute substantially to an air quality violation, or result in a cumulatively
16 considerable net increase in criteria air pollutants within the SFBAAB.

17 **Ozone Precursors**

18 The SFBAAB is designated as non-attainment for ozone and PM. Ozone is a secondary
19 air pollutant produced in the atmosphere through a complex series of photochemical
20 reactions involving reactive organic gases (ROG) and oxides of nitrogen (NO_x). The
21 potential for a project to result in a cumulatively considerable net increase in criteria air
22 pollutants, which may contribute to an existing or projected air quality violation, are
23 based on the CCAA and Federal CAA emissions limits for stationary sources. To ensure
24 that new stationary sources do not cause or contribute to a violation of an air quality
25 standard, BAAQMD Regulation 2, Rule 2 requires that any new source that emits
26 criteria air pollutants above a specified emissions limit must offset those emissions. For
27 ozone precursors ROG and NO_x, the offset emissions level is an annual average of 10
28 tons per year (or 54 pounds per day). These levels represent emissions by which new
29 sources are not anticipated to contribute to an air quality violation or result in a
30 considerable net increase in criteria air pollutants.

31 **Particulate Matter (PM₁₀ and PM_{2.5}) and Fugitive Dust**

32 The Federal New Source Review program was created by the Federal CAA to ensure
33 that stationary sources of air pollution are constructed in a manner that is consistent
34 with attainment of federal health-based ambient air quality standards. Emissions limits
35 under the Federal New Source Review for PM₁₀ and PM_{2.5} are 15 and 10 tons per year
36 (82 and 54 pounds per day), respectively. These limits represent levels at which a
37 source is not expected to impact air quality. Although the regulations specified above

1 apply to new or modified stationary sources, land use development projects result in
2 ROG, NO_x, PM₁₀, and PM_{2.5} emissions from increases in vehicle trips, architectural
3 coating, and construction activities. Therefore, the above thresholds can be applied to
4 the construction and operational phases of land use projects, and those projects that
5 result in emissions below these thresholds would not be considered to contribute to an
6 existing or projected air quality violation or result in a considerable net increase in ozone
7 precursors or particulate matter. Due to the temporary nature of this Project's activities,
8 only the average daily thresholds are applicable to construction-phase emissions.

9 Fugitive dust emissions are typically generated during construction phases. Studies
10 have shown that the application of individual best management practices (BMPs) at
11 construction sites can reduce fugitive dust by 10 to 98 percent depending on the
12 measure (Western Regional Air Partnership 2006). The BAAQMD has identified several
13 BMPs to control fugitive dust emissions from construction activities.

14 **Local Health Risks and Hazards**

15 In addition to criteria air pollutants, individual projects may emit toxic air contaminants
16 (TACs). TACs collectively refer to a diverse group of air pollutants that are capable of
17 causing chronic (i.e., long duration) and acute (i.e., severe but short-term) adverse
18 effects to human health, including carcinogenic effects. Human health effects of TACs
19 include birth defects, neurological damage, cancer, and mortality. There are hundreds
20 of different types of TACs with varying degrees of toxicity. Individual TACs vary greatly
21 in the health risk they present; at a given level of exposure, one TAC may pose a
22 hazard that is many times greater than another.

23 Unlike criteria air pollutants, TACs do not have ambient air quality standards but are
24 regulated by the BAAQMD using a risk-based approach to determine which sources
25 and pollutants to control as well as the degree of control. A health risk assessment is an
26 analysis in which human health exposure to toxic substances is estimated, and
27 considered together with information regarding the toxic potency of the substances, to
28 provide quantitative estimates of health risks.

29 The BAAQMD CEQA Air Quality Guidelines establish a relevant zone of influence for an
30 assessment of project-level and cumulative health risks to sensitive receptors within
31 1,000 feet of a project site from exposure to TACs. Project construction-related or
32 operational TAC impacts to sensitive receptors within the zone of influence that exceed
33 any of the following thresholds are considered significant:

- 34 • An excess cancer risk level of more than 10 in one million or a non-cancer
35 hazard index greater than 1.0.
- 36 • An incremental increase of greater than 0.3 micrograms per cubic meter (µg/m³)
37 for annual average PM_{2.5} concentrations.

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

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

10 These local health risk and hazard thresholds are also listed above in Table 3.3-4.

11 3.3.2.2 Solano County

12 At the local level, the Solano County General Plan Public Health and Safety Chapter
13 includes policies and implementation programs that aim to improve local and regional
14 air quality throughout the County (Solano County 2015a). The following air quality
15 policies may be applicable to the Project:

- 16 • Policy HS.P-44: Minimize health impacts from sources of toxic air contaminants,
17 both stationary (e.g., refineries, manufacturing plants) as well as mobile sources
18 (e.g., freeways, rail yards, commercial trucking operations).
- 19 • Implementation Program HS.I-54: Require the implementation of best
20 management practices to reduce air pollutant emissions associated with the
21 construction of all development and infrastructure projects.

22 3.3.3 Impact Analysis

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

24 **Less than Significant Impact.** The BAAQMD guidelines recommend that a project's
25 potential to conflict with the 2010 Clean Air Plan be determined by evaluating the
26 project's consistency with BAAQMD CEQA significance thresholds. The Project would
27 generate emissions during construction from construction equipment, marine engines,
28 and haul and worker vehicle trips. As discussed in Checklist Item **b)**, emissions of ROG,
29 NO_x, and PM generated during Project construction would not exceed BAAQMD CEQA
30 significance thresholds.

31 The Project would replace an approximately 1.2-mile segment of the Bay Area Pipe
32 Line (BAPL) that runs through Mallard Farms. The replacement pipeline segment would
33 be the same size as the existing pipe, and the Project would not increase BAPL
34 capacity or throughput. Therefore, the Project would not result in a substantial increase

1 in operational emissions compared to existing conditions and would not be anticipated
2 to result in operational emissions exceeding BAAQMD CEQA significance thresholds.

3 Because construction and operational emissions would not exceed BAAQMD CEQA
4 significance thresholds, the Project would not have regionally significant impacts
5 impeding the implementation of the control strategies or the attainment of goals set in
6 the BAAQMD's 2010 Clean Air Plan. Therefore, this impact would have a less than
7 significant impact on the implementation of applicable air quality plans.

8 ***b) Violate any air quality standard or contribute substantially to an existing or***
9 ***projected air quality violation?***

10 **Less than Significant Impact.** The Project would generate emissions during both
11 construction and operation.

- 12 • Project construction emissions would result from construction equipment, marine
13 engines, and haul truck and worker vehicle trips. These emissions are discussed
14 in greater detail below.
- 15 • Regarding pipeline operations, the replacement pipe segment would be the same
16 size as the existing pipe, and the Project would not increase the capacity or
17 throughput of the BAPL. Therefore, operations would not be anticipated to result
18 in an increase in operational emissions and impacts would be less than
19 significant, and are not discussed further in this document.

20 Emissions from construction equipment and vehicle trips were calculated using the
21 California Emissions Estimator Model (CalEEMod) v2013.2.2. CalEEMod uses widely
22 accepted models for emission estimates and default data from sources such as USEPA
23 AP-42 emission factors, CARB vehicle emission models, and agency studies such as by
24 the California Energy Commission (California Air Pollution Control Officers Association
25 2013). Project-specific data, including equipment lists, operating schedules, and vehicle
26 activity rates, were used as inputs to the model. Detailed CalEEMod model output and
27 the construction equipment list are included in Appendix B. Emissions from marine
28 engines, including barges and tugboats, were estimated using manual spreadsheet
29 calculations based on Project-specific equipment lists and activity data, and emission
30 factors were derived from CARB's OFFROAD2011 modules for harbor craft emissions.
31 Emissions calculation methodologies, assumptions, and details are provided in
32 Appendix B.

33 Total Project construction emissions were estimated, and a daily average emissions
34 rate was calculated for comparison with applicable significance thresholds. Based on
35 the construction schedule, this analysis assumes that construction activities would be
36 completed over approximately 4 months total. Average daily emissions were calculated
37 using this 4-month construction duration, assuming 30 working days per month.

1 Emissions calculations for each work component are summarized in Table 3.3-4 and
 2 included in Appendix B. The Project would not violate any air quality standards or
 3 contribute substantially to any existing or projected air quality violation because Project-
 4 related emissions do not exceed BAAQMD significance thresholds.

Table 3.3-4. Project Construction Criteria Pollutant Emissions

Work Component	Construction Source Emissions (tons)			
	ROG	NO _x	Exhaust PM ₁₀	Exhaust PM _{2.5}
Horizontal Directional Drilling	0.04	0.68	0.02	0.02
Pipeline Replacement	0.06	0.61	0.02	0.02
Construction Office ¹	0.01	0.17	< 0.01	< 0.01
Marine Construction Equipment ²	0.23	1.62	0.06	0.06
Total Construction Emissions (tons)³	0.34	3.08	0.10	0.10
Average Daily Construction Emissions (lbs/day)⁴	5.6	51.4	1.7	1.6
BAAQMD Daily Threshold (lbs/day)	54	54	82	54
Exceeds Threshold?	No	No	No	No

Acronyms: BAAQMD = Bay Area Air Quality Management District; lbs/day = pounds per day; NO_x = oxides of nitrogen; PM₁₀ and PM_{2.5} = particulate matter less than or equal to 10 microns in diameter or 2.5 micrometers in diameter, respectively; ROG = reactive organic gases.

Notes:
¹ Construction office activities include the operation of vehicles and off-road equipment.
² Marine equipment activities include the operation of marine vessels, vehicles, and off-road equipment.
³ Totals in the table may not exactly add up due to rounding.
⁴ Average daily emissions calculated assuming construction activities occur over 4 months at 30 days per month.

5 The BAAQMD does not have quantitative mass emissions thresholds for fugitive PM₁₀
 6 and PM_{2.5} dust. Instead, the BAAQMD recommends the implementation of applicable
 7 BMPs to reduce fugitive dust emissions, such as the following Basic Construction
 8 Mitigation Measures listed in the BAAQMD 2011 CEQA Guidelines:

- 9 • All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas,
 10 and unpaved access roads) shall be watered two times per day.
- 11 • All haul trucks transporting soil, sand, or other loose material offsite shall be
 12 covered.
- 13 • All visible mud or dirt track-out onto adjacent public roads shall be removed using
 14 wet power vacuum street sweepers at least once per day. The use of dry power
 15 sweeping is prohibited.
- 16 • All vehicle speeds on unpaved roads shall be limited to 15 miles per hour.
- 17 • All roadways, driveways, and sidewalks to be paved shall be completed as soon
 18 as possible. Building pads shall be laid as soon as possible after grading unless
 19 seeding or soil binders are used.

- 1 • Idling times shall be minimized either by shutting equipment off when not in use
2 or reducing the maximum idling time to 5 minutes (as required by the California
3 airborne toxics control measure [Cal. Code Regs., tit. 13, § 2485]). Clear signage
4 shall be provided for construction workers at all access points.
- 5 • All construction equipment shall be maintained and properly tuned in accordance
6 with manufacturer’s specifications. All equipment shall be checked by a certified
7 visible emissions evaluator.
- 8 • Post a publicly visible sign with the telephone number and person to contact at
9 the lead agency regarding dust complaints. This person shall respond and take
10 corrective action within 48 hours. The Air District’s phone number shall also be
11 visible to ensure compliance with applicable regulations.

12 The Project would incorporate applicable dust control measures that are consistent with
13 BAAQMD-recommended control measures. Therefore, fugitive dust impacts from
14 Project construction would be less than significant.

15 ***c) Result in a cumulatively considerable net increase of any criteria pollutant for***
16 ***which the Project region is non-attainment under an applicable federal or state***
17 ***ambient air quality standard (including releasing emissions which exceed***
18 ***quantitative thresholds for ozone precursors)?***

19 **Less than Significant Impact.** The SFBAAB is designated as a nonattainment area for
20 state and national ozone standards and national particulate matter ambient air quality
21 standards. Past, present, and future development projects contribute to the region’s
22 adverse air quality impacts on a cumulative basis. In developing thresholds of
23 significance for air pollutants, BAAQMD considered the emission levels for which a
24 project’s individual emissions would be cumulatively considerable. If a project does not
25 exceed the identified significance thresholds, its emissions would not be cumulatively
26 considerable, resulting in less than significant air quality impacts on the region’s existing
27 air quality conditions. Therefore, additional analysis to assess cumulative impacts is
28 unnecessary. Based on the Project-level analysis described above in Checklist Item **b)**,
29 Project construction and operational criteria pollutant emissions would not exceed
30 BAAQMD CEQA significance thresholds. Therefore, pursuant to the BAAQMD CEQA
31 Guidelines, the Project would not be cumulatively considerable, and would result in a
32 less than significant cumulative impact.

33 ***d) Expose sensitive receptors to substantial pollutant concentrations?***

34 **Less than Significant Impact.** Diesel particulate matter (DPM) exhaust emissions
35 generated during Project construction would result from the use of heavy equipment
36 and marine engines. DPM is classified as a TAC by the CARB and poses potential
37 carcinogenic and chronic non-cancer health risks. No sensitive receptors are located
38 within the 1,000-foot zone of influence around the Project site recommended by the

1 BAAQMD for screening of Project-level and cumulative health risks. The closest
2 sensitive receptor locations to the construction area are Shore Acres Elementary School
3 in Bay Point, approximately 4 miles south of the South Work Area, and the Concentra
4 Medical Center located in Pittsburg, approximately 4 miles southeast of the Project
5 area. Because of this distance and the dispersive properties of DPM (Zhu et al. 2002),
6 the Project would not expose sensitive receptors to substantial pollutant concentrations.
7 Therefore, the Project's impact would be considered less than significant.

8 ***e) Create objectionable odors affecting a substantial number of people?***

9 **Less than Significant Impact.** The occurrence and severity of odor impacts depends
10 on numerous factors, including the nature, frequency, and intensity of the source; wind
11 speed and direction; and the sensitivity of the receptors. Although offensive odors rarely
12 cause any physical harm, they can be very unpleasant, leading to considerable distress
13 among the public and cause citizens to submit complaints to local governments and
14 regulatory agencies. Projects with the potential to frequently expose individuals to
15 objectionable odors are deemed to have a significant impact. Typical odor-generating
16 facilities include wastewater treatment facilities, sanitary landfills, composting facilities,
17 petroleum refineries, chemical manufacturing plants, and food processing facilities.

18 As described in Checklist Item **d)** above, Project construction equipment would
19 generate DPM exhaust, which some individuals consider offensive; however, the
20 Project area is not located near any sensitive receptors. Because of the distance and
21 the temporary nature of construction activities, the potential for objectionable odors to
22 reach the nearest receptor is expected to be negligible. These distant and temporary
23 activities are not expected to cause a significant odor impact on a substantial number of
24 sensitive receptors, nor would they expose a substantial number of receptors to odor
25 emissions. Therefore, the Project's impact would be less than significant.

26 **3.3.4 Mitigation Summary**

27 The Project would not result in significant impacts to Air Quality; therefore, no mitigation
28 is required.

1 **3.4 BIOLOGICAL RESOURCES**

BIOLOGICAL RESOURCES – Would the Project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) 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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2 **3.4.1 Environmental Setting**

3 The Project is located within Suisun Marsh, north of Honker Bay, in Solano County and
 4 extends into Honker Bay approximately 7,000 feet from the shore (Figure 1-1). Suisun
 5 Marsh is the largest contiguous brackish marsh remaining on the west coast of North
 6 America and is a critical part of the San Francisco Bay-Delta estuary ecosystem.
 7 Encompassing 116,000 acres, Suisun Marsh includes 52,000 acres of managed
 8 wetlands, 30,000 acres of bays and sloughs, 27,700 acres of uplands, and 6,300 acres
 9 of tidal wetlands. Suisun Marsh serves as the resting and feeding ground for tens of

1 thousands of wintering and migrating waterfowl and provides habitat for more than 221
2 species of birds.

3 The Project area contains both terrestrial and estuarine environments including tidally
4 influenced freshwater sloughs, brackish marsh, and tidal bay wetlands. Marshland and
5 sloughs on-site are either currently or historically managed with engineered earthen
6 levees and tide gates, and exhibit either muted or direct tidal influence.

7 Terrestrial environments are found in and around the North Work Area, access roads,
8 and staging areas (see Figure 3.4-1). The North Work Area is located in a seasonally-
9 inundated managed brackish marsh and is bordered to the north by a levee that
10 separates it from an unvegetated engineered slough channel (Steve's Ditch). Inundation
11 is controlled primarily by two CDFW-operated tide gates north and south of the work
12 area. The water used for inundation is controlled by the California Department of Water
13 Resources (DWR), and entrainment of fish is avoided through the use of dual fish
14 screens. CDFW typically opens the gates to flood the area just before waterfowl hunting
15 season (September) and closes the gates just after the close of the season (February).
16 The North Work Area is also within the boundaries of the Grizzly Island Wildlife Area,
17 where seasonal hunting occurs. Elk hunting season begins in late July and continues
18 through late September, and waterfowl hunting season begins in October and continues
19 through February. During these hunting seasons, access to the Grizzly Island Wildlife
20 Area is heavily restricted by CDFW.

21 The South Work Area is in an open water estuarine environment in Honker Bay
22 approximately 350 feet from shore. Water depth at the South Work Area ranges from 5
23 feet deep (during mean lower low water) to 10.8 feet deep (during mean higher high
24 water). The substrate in the South Work Area is bay mud.

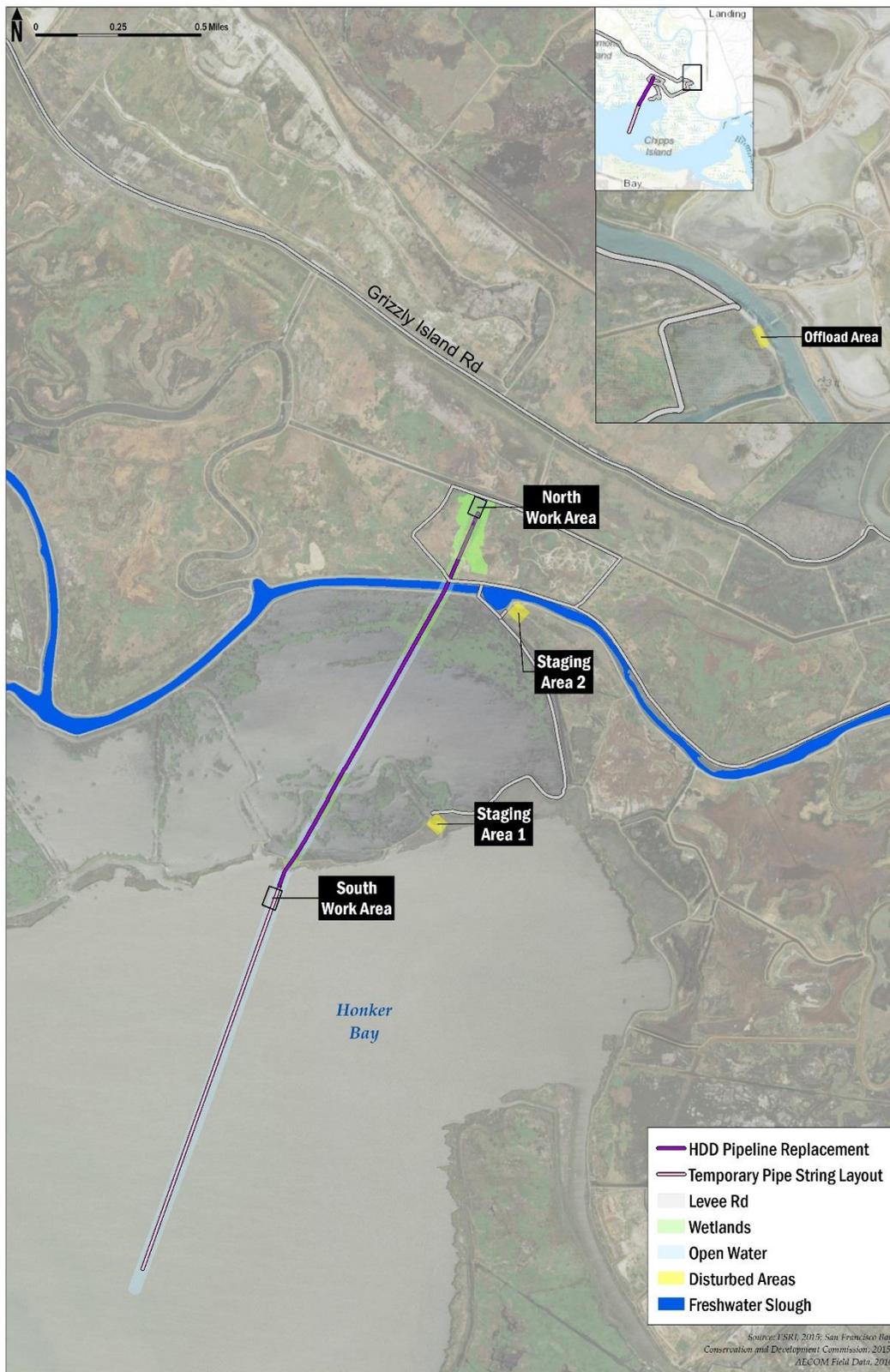
25 3.4.1.1 Habitat Types

26 **Wetlands**

27 Wetlands in the Project area are emergent wetlands characterized by brackish water,
28 which results from the mixing of more saline tidal waters from Suisun Bay and
29 freshwater inputs from the Sacramento River and sloughs that pass through Suisun
30 Marsh on their way into Suisun Bay. Marshland and sloughs on-site are either currently
31 or historically managed with engineered earthen levees and tide gates, and exhibit
32 either muted tidal influence or inundation managed using culverts and gates. Two
33 distinct segments of brackish emergent wetlands occur and are distinguished by levees
34 and inundation regimes. One segment, the Mallard Farms tract, is subject to tidal
35 inundation resulting from a breach in the outer levee between the Mallard Farms tract
36 and Honker Bay. This area exhibits a muted tidal influence and is largely open water.
37 Tide gates control inundation in the Grizzly Island Wildlife Area.

1

Figure 3.4-1. Habitat Map



1 The brackish wetland community in the Grizzly Island Wildlife Area, at the location of
2 the North Work Area, supports two vegetation strata. The upper stratum is composed of
3 tall, dense stands dominated by common reed (*Phragmites australis*) and broadleaved
4 cattails (*Typha latifolia*). The lower stratum is dominated by herbaceous vegetation,
5 such as common tule (*Schoenoplectus acutus*), brass buttons (*Cotula coronopifolia*),
6 coastal salt grass (*Distichlis spicata*), alkali heath (*Frankenia salina*), fat hen (*Atriplex*
7 *prostrata*), rabbitsfoot grass (*Polypogon monspeliensis*), and pickleweed (*Salicornia*
8 *pacifica*). Dense pickleweed patches are absent from the Project area and only four
9 very small patches of pickleweed plants have been observed in the North Work Area.
10 No other pickleweed was identified in the Project area.

11 The brackish marsh community to the south in the Mallard Farms tract is permanently
12 inundated due to the levee breach, and supports multiple species that typically form a
13 tall, dense stand of vegetation and overlap the perimeter of the open water. The
14 vegetation is dominated by common reed. Other vegetation observed in this area
15 includes common tule and broadleaved cattails in variable abundance.

16 **Upland/Ruderal Vegetation**

17 The tops and edges of levees near the work and staging areas and access routes
18 primarily feature invasive upland species including poison hemlock (*Conium maculatum*),
19 Italian ryegrass (*Festuca perennis*), wild radish (*Raphanus sativus*), fennel (*Foeniculum*
20 *vulgare*), or native upland species historically present along marsh edges including
21 California rose (*Rosa californica*), coyote brush (*Baccharis pilularis*), gumweed (*Grindelia*
22 *stricta*), alkali mallow (*Malvella leprosa*), and salt sand spurry (*Spergularia* spp.).

23 **Disturbed Areas**

24 Staging Area 1 is bordered by a tidal slough to the east and north, and by brackish
25 marsh to the west. Staging Area 1 contains gravel covered by patchy vegetation. The
26 area is used as a camp during hunting seasons and several small buildings and building
27 materials are located within the site, indicating regular disturbance. Staging Area 2 is
28 bordered by a dirt road, an engineered slough channel to the north, and a brackish
29 marsh to the south. Staging Area 2 contains gravel covered by patchy grass. Several
30 trailers, two boats, two shipping containers, and a vehicle were present at Staging Area
31 2 during a February 2016 site visit, indicating previous disturbance of the site.

32 **Open Water**

33 Open-water areas consist of deeper water depths in the Project area that do not support
34 emergent wetland vegetation. These are in Honker Bay and in the inundated areas of
35 the Mallard Farms tract. The areas within Mallard Farms are subject to a muted tidal

1 regime as a result of water entering through levee breaches. Honker Bay experiences
2 direct tidal influence with a mean tidal range of 5.8 feet.

3 Eelgrass has not been mapped in the South Work Area, but sago pondweed (*Stuckenia*
4 *pectinata*) was mapped nearer to shore than the work area at less than 3 percent cover
5 during a 2012 survey (Boyer et al. 2012).

6 **Sensitive Natural Communities and Designated Critical Habitat**

7 No sensitive natural communities are present in the Project area. During the field
8 review, dominant vegetation in the North Work Area was mapped in general accordance
9 with the Manual of California Vegetation (Sawyer et al. 2009). The results of the
10 vegetation mapping were compared with the List of Vegetation Alliances and
11 Associations (or Natural Communities List) (CDFW 2010) to determine if any of the
12 identified natural communities represent a high-quality example of a sensitive natural
13 community (those with a State Rank⁵ of 3 or higher). One plant species, alkali health
14 (*Frankenia salina*), was found within a small portion of the North Work Area. Within this
15 small patch, few co-dominant herbaceous vegetation species typically associated with a
16 high-quality example of this community were observed. Furthermore, the North Work
17 Area is subject to management for waterfowl by seasonal flooding controlled through
18 tide gates, and this population of alkali health does not receive the normal hydrological
19 regime or tidal fluctuations. For these reasons, it is not considered a sensitive natural
20 community.

21 Designated critical habitat has not been identified at the North Work Area, staging
22 areas, or the access roads. However, the South Work Area is within designated critical
23 habitat for the following federally-listed species:

- 24 • Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*)
25 Evolutionarily Significant Unit (ESU);
- 26 • Southern Distinct Population Segment (DPS) of the North American green
27 sturgeon (*Acipenser medirostris*; hereinafter referred to as green sturgeon); and
- 28 • Delta smelt (*Hypomesus transpacificus*).

29 The South Work Area is also located within Essential Fish Habitat (EFH) for various life
30 stages of fish species that are managed in accordance with the following Fishery
31 Management Plans (FMPs), under the Magnuson-Stevens Fishery Conservation and
32 Management Act:

⁵ State Rank 3 is a community that is classified as vulnerable. The community is vulnerable in California due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

- 1 • Pacific Groundfish FMP: various species of rockfishes, flatfishes, sharks;
- 2 • Coastal Pelagic FMP: northern anchovy (*Engraulis mordax*), Pacific sardine
- 3 (*Sardinops sagax caerulea*), jack mackerel (*Trachurus symmetricus*); and
- 4 • Pacific Coast Salmon FMP: Chinook and coho salmon (*Oncorhynchus kisutch*).

5 In addition, the portion of the Project within Honker Bay (South Work Area) is
6 designated as a Habitat Area of Particular Concern (HAPC), which is described in the
7 regulations as a subset of EFH that is rare, particularly susceptible to human-induced
8 degradation, especially ecologically important, or located in an environmentally stressed
9 area.

10 3.4.1.2 Special-Status Species

11 Based on reviews of the California Natural Diversity Database (CNDDDB), an official
12 species list from the National Marine Fisheries Service (NMFS), a U.S. Fish and Wildlife
13 Service (USFWS) Information Planning and Conservation official species list, a
14 California Native Plant Society (CNPS) query, other available public documents, and in
15 coordination with CDFW, several special-status species have the potential to occur in
16 the Project vicinity (Table 3.4-1). The determinations for the potential to occur in the
17 Project area are based on the range of the species, the habitat requirements of the
18 species, and the habitats present within the Project area, as well as a number of site
19 visits conducted to gather information about the vegetation and wildlife present.
20 Appendix C provides a list of wildlife species observed in the Project area.

21 The Project area is located outside of the known geographic range and lacks suitable
22 habitat for many of the special-status species identified in the Project area based on
23 background research and coordination with CDFW. For these reasons, these special-
24 status species have no potential to occur in the Project area and are not discussed
25 here. For many other species, the Project area contains marginal habitat, has very poor-
26 quality habitat, or is located on the edge of the species' known geographic or elevation
27 range; for these reasons, these species have very low potential to occur in the Project
28 area based on background research and coordination with CDFW. These species are
29 included in the analysis because potentially suitable habitat is present and the Project is
30 located in the known geography and elevation range of the species; in some instances,
31 these species are also included because there are known occurrences in close
32 proximity to the Project area. The special-status species that have moderate or high
33 potential to occur, or are present in the Project area, are discussed in more detail in this
34 analysis. In total, nine federally-listed species, three state-listed species, and one other
35 special-status or rare species have the potential to occur in the Project area.

Table 3.4-1. Federal- and State-Listed Species that May Occur in Project Area

Common Name	Scientific Name	Status	Habitat	Potential to Occur
Plants				
Soft bird's beak	<i>Chloropyron molle</i> ssp. <i>molle</i>	FE, SR, CNPS 1B ¹	Upper reaches of coastal marsh, at the limit of tidal influence. Elevations 0-3m.	Low Potential: Suitable habitat in vicinity of North Work Area. Current management regime may preclude species from the Project area. Not observed during surveys.
Suisun thistle	<i>Cirsium hydrophilum</i> var. <i>hydrophilum</i>	FE, CNPS 1B	Riparian, salt, and brackish marshes. Elevations 0-1m.	Low Potential: Suitable habitat present in Project area. Current management regime may preclude species from Project area. Not observed during surveys.
Mason's lilaepsis	<i>Lilaeopsis masonii</i>	SR, CNPS 1B	Occurs in riparian, freshwater marsh, and brackish marshes. Common in Suisun Bay. Exploits newly deposited or exposed sediment. Elevation 0-10m.	Low Potential: Suitable habitat occurs in the vicinity of the North Work Area and along the right-of-way.
Reptiles				
Giant garter snake	<i>Thamnophis gigas</i>	FT, ST	Freshwater marsh, slow flow streams, canals, and irrigation ditches.	Low Potential: Habitat along access roads is atypical for species (brackish); however, a recent occurrence was recorded on levee access roads. No Potential: In North or South Work Areas, no potential to occur due to lack of suitable habitat.
Fish				
Chinook salmon • Central Valley spring-run • Sacramento River winter-run	<i>Oncorhynchus tshawytscha</i>	FT, ST	Populations occur in Sacramento River and its tributaries; migratory runs pass through the Delta.	Moderate Potential: Suitable habitat is present in Project area.
		FE, SE		
Steelhead (Central Valley DPS)	<i>Oncorhynchus mykiss irideus</i>	FT	Populations occur in Sacramento and San Joaquin rivers and their tributaries; migratory runs pass through the Delta.	Moderate Potential: May occur in open water areas within Project area.
Delta smelt	<i>Hypomesus transpacificus</i>	FC, SE	Range includes San Pablo and Suisun Bays up to freshwater tributaries; most common in low salinities (0.2 to 5.0 ppt), high turbidities, and moderate temperatures.	Moderate Potential: May occur in open water areas within Project area if salinity regime at the time of construction is suitable.

Table 3.4-1. Federal- and State-Listed Species that May Occur in Project Area

Common Name	Scientific Name	Status	Habitat	Potential to Occur
Longfin smelt	<i>Spirinchus thaleichthys</i>	ST	Found in open waters of estuaries, mostly in middle or bottom of water column in salinities of 15 to 30 ppt.	Moderate Potential: May occur in open water areas within Project area.
North American green sturgeon (southern DPS)	<i>Acipenser medirostris</i>	FT	Juveniles and adults live in oceans and estuaries. Spawning occurs in freshwater rivers on cobble, clean sand, or bedrock.	Moderate Potential: May occur in open water areas within the Project area. No spawning areas occur in the Project area.
Birds				
California black rail	<i>Laterallus jamaicensis coturniculus</i>	ST, FP	Freshwater marshes, wet meadows, and shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat.	Moderate Potential: Marsh vegetation in the vicinity of North Work Area may provide temporary shelter but does not support roosting or nesting habitat. Species observed in proximity to the North Work Area.
Swainson's hawk	<i>Buteo swainsoni</i>	ST	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands. Requires adjacent suitable foraging areas (e.g., grasslands, or alfalfa or grain fields that support rodent populations).	Observed/Low Potential: No suitable nesting and roosting habitat in Project area, but species was observed during a site visit. Potential foraging habitat present.
Ridgway's rail (formerly California clapper rail)	<i>Rallus obsoletus</i>	FE, SE, FP	Saltwater and brackish marshes traversed by tidal sloughs around San Francisco Bay. Associated with abundant growth of pickleweed. Feeds away from cover on invertebrates from mud-bottomed sloughs.	Low Potential: Marsh vegetation in vicinity of North Work Area may provide temporary shelter; however, Project area does not support roosting or nesting habitat.
Mammals				
Salt marsh harvest mouse	<i>Reithrodontomys raviventris</i>	FE, SE, FP	Found only in saline or brackish upland, emergent wetlands of San Francisco Bay and its tributaries. Pickleweed is its primary habitat. They do not burrow, but build loosely organized nests and require higher areas for flood escape.	Moderate Potential: Habitat in Project area does not appear to be suitable for species. However, species has been observed in similar habitats within Grizzly Island Wildlife Area (Thompson 2016).
<p>Acronyms: CNPS = California Native Plant Society; DPS = Distinct Population Segment; FE = Federally Endangered; FP = Fully Protected; FT = Federally Threatened; ppt = parts per thousand; SE = State Endangered; SR = State Rare; ST = State Threatened.</p> <p>Note: ¹ CNPS List 1.B = Plants Rare, Threatened, or Endangered in California and Elsewhere.</p>				

1 **Plants**

2 Several special-status plant species are known to occur within a 5-mile radius of the
3 Project area (CDFW 2016a). Based on these known occurrences in the vicinity of the
4 Project and the presence of potentially suitable habitat in the vicinity of the Project,
5 three species were considered to have potential to occur in the Project area: Mason's
6 lilaepsis (*Lilaeopsis masonii*), Suisun thistle (*Cirsium hydrophilum* var. *hydrophilum*),
7 and soft bird's beak (*Chloropyron molle* ssp. *molle*). However, for these species, field
8 surveys indicated that the Project area is largely devoid of suitable habitat, the habitat
9 present is degraded (e.g., staging areas), or the habitat management regime
10 (flooding/draining) is inappropriate for these species. As a result, the potential for
11 special-status plant species to occur in the Project area is low. Various field surveys
12 were conducted to identify plant species within the Project area, however, no rare or
13 special-status plants were observed. A list of plant species observed in the Project area
14 is included in Appendix C.

15 **Reptiles**

16 Only one special-status reptile or amphibian has potential to occur in the Project area:
17 the giant garter snake (*Thamnophis gigas*). The North Work Area and South Work Area
18 do not contain habitat for giant garter snake. Giant garter snakes are known to sun
19 themselves on roads or on the tops of banks adjacent to roadways that vehicles
20 traverse (USFWS 2015a). Most recently, there was an occurrence of this species along
21 a nearby levee road near Montezuma Slough. As a result, this species has potential to
22 occur in the Project Area, specifically along levee roads and near the offloading area at
23 Montezuma Slough.

24 **Fish**

25 Several special-status fish species have the potential to occur in the Project area. The
26 potential for special-status fish to occur in the North Work Area is very low because the
27 work area is located in a managed portion of the marsh that would be drained during the
28 construction period. Inundation of the area is managed by CDFW, and the water used to
29 flood the area is managed by DWR (including dual fish screens to avoid fish
30 entrainment). Special-status fish species are anticipated to be present in the South
31 Work Area. These species are discussed further below.

32 Salmonids: The South Work Area is located in the migration corridor for special-status
33 salmonids. Individual salmonids may be present during their migration from the San
34 Francisco Bay to natal tributaries and may use the open water areas as foraging habitat
35 during the smolt emigration period (CalFish 2016). A study conducted by the NMFS
36 Santa Cruz Laboratory (MacFarlane and Norton 2002) found that the residency time of

1 juvenile Chinook salmon within the estuary was about 40 days, with little growth
2 occurring during that time.

3 Based on occurrence records gathered from the CNDDDB, CDFW's Spring Kodiak Trawl
4 surveys records, CDFW's 20-millimeter survey, CDFW's Fall Midwater Trawl surveys, a
5 University of California, Davis, Suisun Marsh Fish Study, and on information about the
6 species' presence in the San Francisco Bay, a potential exists for salmonids to be
7 present at low densities in the estuarine portions of the Project area during construction.

8 Green sturgeon: The entire San Francisco Bay contains adult and juvenile green
9 sturgeon throughout the year, in both the seawater and mixing zones (Miller and Kaplan
10 2001). Beginning in late winter, adult green sturgeon enter San Francisco Bay and
11 migrate through the Carquinez Strait to the Sacramento-San Joaquin system, where
12 they spawn between April and early July (NMFS 2015). No current or historic spawning
13 locations for green sturgeon are known in San Francisco Bay drainages outside this
14 river system. Based on these occurrence records and information about green sturgeon
15 presence in the San Francisco Bay, a potential exists for green sturgeon to be present
16 at low densities in the estuarine portions of the Project area during construction.

17 Delta smelt/Longfin smelt: Based on data presented in CDFW's Fall Midwater Trawl
18 surveys annual abundance index, and the University of California, Davis, Suisun Marsh
19 Fish Study, there is a potential for delta smelt and longfin smelt to occur in the South
20 Work Area at low densities during construction.

21 **Birds**

22 A number of special-status bird species could be present within the Project area.
23 Special-status bird species include both migratory birds protected under the Migratory
24 Bird Treaty Act (MBTA), as well as birds listed under the Federal Endangered Species
25 Act (FESA) and the California Endangered Species Act (CESA). Nesting birds have
26 been observed in the Project area and may be present in the Project area during
27 construction.

28 Special-status bird species protected under the FESA and CESA have the potential to
29 occur in or near the Project area: Ridgway's rail (*Rallus obsoletus*), California black rail
30 (*Laterallus jamaicensis coturniculus*), and Swainson's hawk (*Buteo swainsoni*). Both
31 Ridgway's rail and black rail are known to occur in portions of the Suisun Marsh year-
32 round. The closest known Ridgway's rail breeding habitat is in the Suisun Marsh,
33 approximately 8 to 10 miles northwest of the Project area. Other recorded occurrences
34 are approximately 3.5 miles southwest of the Project area. Ridgway's rails have not
35 been observed in Grizzly Island Wildlife Area since 2008 and have not been seen in
36 Suisun Marsh since 2011 (Graham 2015; Estrella 2016). They are unlikely to occur in
37 the vicinity of the North Work Area due to poor quality habitat, lack of preferred habitat

1 and tidal influence, openness of the habitat related to the management of tidal ponds,
2 and low density of cover.

3 California black rails are known to occur in habitats similar to those present in the North
4 Work Area when they are not flooded (February to September). There are several
5 CNDDDB occurrences of the species in the vicinity of the North Work Area (CDFW
6 2016a), and they have been observed in Grizzly Island Wildlife Area (Graham 2016).
7 The California black rail is not expected to occur in the North Work Area during periods
8 when the pond is flooded (September to February) due to openness, depth of
9 inundation, and lack of vegetation. The rails are unlikely to nest in the North Work Area
10 or surrounding areas because they breed in high marsh habitat near regularly inundated
11 tidal sloughs, and these habitats are not present in the Project area. In addition, the
12 staging areas, low marsh, and open water areas present in the South Work Area and
13 between the North and South Work Area do not contain suitable habitat for the
14 Ridgway's rail or California black rail (Solano County Water Agency 2012). However,
15 these species could occur occasionally or incidentally in or near the Project area as they
16 move between areas of suitable habitat.

17 Based on site visits and review of aerial photography, no suitable nest trees for
18 Swainson's hawk are present within 1,000 feet of the Project area. Five Swainson's
19 hawk nests have been recorded within 10 miles of the North Work Area. The closest of
20 these sites is located 1.6 miles northwest of the North Work Area. Swainson's hawks
21 were observed in that vicinity between 2007 and 2011, but none were observed in 2012
22 (CDFW 2016a). Suitable foraging habitat is present in Suisun Marsh and the North
23 Work Area, but not present in the open water areas of the South Work Area or the open
24 water areas area between the North and South Work Areas.

25 Migratory birds protected under the MBTA may also be present within the Project area.
26 While wintering and non-breeding migratory birds are not anticipated to be present
27 during Project construction, there is a moderate to high potential for shoreline, wading,
28 waterfowl, and select passerines species to be present near the North Work Area based
29 on an evaluation of the site conditions and the list of observed species. Raptors and
30 other tree-dependent passerines may also be present, using the Project area for
31 foraging, but the abundance of water and lack of suitable tree or large shrub nesting
32 habitat in proximity to the Project likely precludes the species from nesting in the Project
33 area.

34 **Mammals**

35 Only one special-status mammal species has potential to occur in the Project area: the
36 salt marsh harvest mouse (*Reithrodontomys raviventris*). Known occurrences of the salt
37 marsh harvest mouse are documented in marshes north, east, and west of the Project
38 area; therefore, salt marsh harvest mice may occur in the Project area. Although the

1 habitat at the North Work Area does not appear to be suitable, according to CDFW, the
2 species has been found in similar habitats within Grizzly Island Wildlife Area (Thompson
3 2016).

4 The species has no potential to occur in the open waters of Honker Bay at the South
5 Work Area and is very unlikely to occur in the open water areas between the North and
6 South Work Areas (south of the Roaring River Slough) due to the depth of inundation. In
7 1999, a salt marsh harvest mouse occurrence was recorded in Mallard Farms between
8 the North and South Work Areas (CDFW 2016a); however, at this time, the levee had
9 not been breached and the area was likely a managed marsh with seasonal inundation
10 and drying. Now, the levee is breached and the habitat is a muted tidal marsh with little
11 vegetation and large amounts of open water. The open water areas are not suitable
12 habitat for this species (Solano County Water Agency 2012), and therefore, the species
13 is expected to be absent in the area between the North and South Work Areas.

14 3.4.1.3 Management in the Suisun Marsh

15 The Project area occurs in a number of natural resource planning areas, including the
16 Grizzly Island Wildlife Area, the Suisun Marsh Habitat Management, Preservation, and
17 Restoration Plan, and the future Solano Multispecies Habitat Conservation Plan. They
18 are briefly described below.

19 **Grizzly Island Wildlife Area**

20 The Grizzly Island Wildlife Area contains eight distinct parcels consisting primarily of
21 tidal wetlands and artificial (diked) marshes. The area is managed by CDFW to create
22 more than 12,000 acres of seasonal ponds. Management practices are targeted toward
23 providing habitat for 100,000 waterfowl that winter in the area each year. The wildlife
24 area offers recreation, hunting, and fishing, and is closed to the public during the
25 hunting seasons for tule elk (late July through late September) and waterfowl (October
26 through the end of February). It is open the last 2 weeks of September for other
27 recreational uses (CDFW 2015).

28 **Suisun Marsh Habitat Management, Preservation, and Restoration Plan**

29 The EIR for the Suisun Marsh Habitat Management, Preservation, and Restoration Plan
30 was completed and certified in 2014. Implementation is expected to be completed over
31 a 30-year period and is intended to balance the benefits of tidal wetland restoration and
32 managed wetland enhancements. The Plan addresses habitats and ecological process,
33 public and private land use, levee system integrity, and water quality through the
34 restoration of 5,000 to 7,000 acres of tidal marsh and the enhancement of more than
35 40,000 acres of managed wetlands, maintaining the heritage of waterfowl hunting,
36 improving water quality for fish and wildlife habitat, and providing other recreational

1 opportunities. The EIR for the Plan also requires the implementation of MMs, including
2 the testing, repair, or replacement of pipelines that have the potential for failure.

3 **Solano Multispecies Habitat Conservation Plan**

4 Developed to support an application for incidental take authorization under the FESA,
5 the Solano Multispecies Habitat Conservation Plan covers 37 species, including both
6 federal and state-listed species. The draft Plan area includes the Project area, which
7 falls within Covered Activity Zone 3. This zone is primarily for the Habitat Conservation
8 Plan reserve system, which includes the restoration, enhancement, and creation of
9 wetlands. Because this Plan is currently being developed by the Solano County Water
10 Agency and has not been formally adopted, potential conflicts are not discussed further
11 in this analysis (Solano County Water Agency 2012; USFWS 2015b).

12 **3.4.2 Regulatory Setting**

13 Federal and state laws and regulations pertaining to biological resources and relevant to
14 the Project are identified in Appendix A. At the local level, Solano County has developed
15 a number of policies to protect and enhance the County's natural habitats and diverse
16 plant and animal communities (Solano County 2008b):

- 17 • RS.P-1: Protect and enhance the County's natural habitats and diverse plant and
18 animal communities, particularly occurrences of special-status species, wetlands,
19 sensitive natural communities, and habitat connections.
- 20 • RS.P-2: Manage the habitat found in natural areas and ensure its ecological
21 health and ability to sustain diverse flora and fauna.
- 22 • RS.P-3: Focus conservation and protection efforts on high-priority habitat areas.
- 23 • RS.P-5: Protect and enhance wildlife movement corridors to ensure the health
24 and long-term survival of local animal and plant populations. Preserve contiguous
25 habitat areas to increase habitat value and to lower land management costs.

26 In addition, the following Solano County policies are a component of the Suisun Marsh
27 Local Protection Program. The following policies apply specifically to the Suisun Marsh
28 area. These policies address the requirements of the Suisun Marsh Protection Plan and
29 the Suisun Marsh Protection Act of 1977 (Solano County 2008a):

- 30 • RS.P-10: The County shall preserve and enhance wherever possible the
31 diversity of wildlife and aquatic habitats found in the Suisun Marsh and
32 surrounding upland areas to maintain these unique wildlife resources.
- 33 • RS.P-11: The County shall protect its marsh waterways, managed and natural
34 wetlands, tidal marshes, seasonal marshes, and lowland grasslands, which are
35 critical habitats for marsh related wildlife.

- 1 • RS.P-12: Existing uses should continue in the upland grasslands and cultivated
2 areas surrounding the critical habitats of the Suisun Marsh in order to protect the
3 marsh and preserve valuable marsh-related wildlife habitats. Where feasible, the
4 value of the upland grasslands and cultivated lands as habitat for marsh-related
5 wildlife should be enhanced.
- 6 • RS.P-15: In marsh areas, the County shall encourage the formation and retention
7 of parcels of sufficient size to preserve valuable tidal marshes, seasonal
8 marshes, managed wetlands, and contiguous grassland areas for the protection
9 of aquatic and wildlife habitat.
- 10 • RS.P-16: The County shall ensure that development in the County occurs in a
11 manner which minimizes impacts of earth disturbance, erosion and water
12 pollution.
- 13 • RS.P-18: The County shall ensure that public access at appropriate locations is
14 provided and protected along the County’s significant waterways within the
15 Suisun Marsh.

16 **3.4.3**

17 **3.4.4 Impact Analysis**

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

22 No permanent, direct impacts to special-status species or their habitats are anticipated
23 to occur in the Project area; however, Project-related noise and construction activities
24 may result in minor and temporary direct impacts. Indirect impacts (i.e., Project-related
25 impacts that are reasonably certain to occur later in time) are not expected to occur.
26 Following Project completion, habitat in the Project area would be returned to pre-
27 Project conditions. Potential impacts to habitats and special-status species resulting
28 from Project-related activities are discussed below.

29 **3.4.4.1 Injury and Mortality**

30 **Less than Significant with Mitigation.** The potential for the injury and mortality of
31 special-status species varies by species and work area locations, as discussed below.

32 North Work Area: Listed fish species would not be present at the North Work Area
33 during the construction period (May to July) because the work area is located in a
34 managed portion of the marsh that is drained between February and September. When
35 inundated, this area of the marsh is shallow and subject to regular seasonal alterations
36 of inundation and desiccation. Based on management practices in this area and the

1 presence of a dual fish screen, there would be no water to support listed fish species in
2 the North Work Area during the construction period.

3 Habitat is present for the salt marsh harvest mouse, Ridgway's rail, California black rail,
4 Swainson's hawk, and giant garter snake in Suisun Marsh. The potential for these
5 species to occur and the potential impacts associated with the Project are as follows:

6 • Salt marsh harvest mouse: Suitable habitat for the salt marsh harvest mouse is
7 not present along the levee access roads, in the staging areas, or the South
8 Work Area (Thompson 2016). The North Work Area is largely devoid of
9 pickleweed plants and does not appear to have suitable habitat for salt marsh
10 harvest mice. However, salt marsh harvest mice have been found to inhabit a
11 wide range of habitats in the Suisun Marsh (Thompson 2016). The species has
12 been documented from several ponds within the Grizzly Island Wildlife Area that
13 contain similar vegetation associations as the North Work Area, although no
14 trapping has been conducted at the North Work Area location (Thompson 2016;
15 Graham 2016). While the North Work Area is seasonally inundated, which may
16 preclude the species for 6 months out of the year, this period does not overlap
17 with the anticipated Project schedule.

18 MMs would be implemented to avoid take (e.g., injury or mortality) of this
19 California fully-protected species. MMs that include the use environmental
20 awareness training (**MM BIO-1**); biological monitoring and surveying (**MM BIO-2**);
21 the use of exclusion fencing (**MM BIO-3**); and hand removal of vegetation (**MM**
22 **BIO-4**) are proposed to mitigate potential impacts to the species. Implementation
23 of **MM BIO-4**, which would remove vegetation and install filter fabric at the North
24 Work Area, would make the habitat temporarily unsuitable for this species, while
25 the construction of the exclusion fence would prevent the species from moving
26 into the North Work Area during construction. With the implementation of the
27 above mentioned MMs, the Project would avoid take of this fully protected
28 species.

29 • Ridgway's rail: The staging areas and levee access roads are cleared uplands
30 and lack suitable habitat for the Ridgway's rail. Open water present in the South
31 Work Area and the Mallard Farm Tract (just north of the South Work Area) does
32 not constitute habitat for Ridgway's rail. Additionally, low elevation brackish
33 marsh is too deep and not likely to support the Ridgway's rail. The North Work
34 Area contains higher-elevation brackish marsh, however, habitat quality is poor
35 due to the vegetation types present (alkali heath, broadleaf cattails, and common
36 reed), low or no cover, and lack of tidal fluctuations. Seasonal flooding at the
37 North Work Area also inundates the potential (low-quality) nesting habitat.
38 Despite regular surveys, this species has not been observed within Grizzly Island
39 Wildlife Area since 2008 (Graham 2016). For these reasons the species is not
40 likely to occur in the Project area, and no impacts are anticipated.

- 1 • California black rail: Suitable habitat for this species is not present along the
2 levee access roads, in the staging areas, or the South Work Area. There are
3 known occurrences and observations of the species in the general vicinity of the
4 Project (CDFW 2016a; Graham 2016); however, the species was not observed
5 during the field surveys. Injury and mortality of the California black rail (a
6 California fully protected species) would be avoided through the implementation
7 of MMs that include the use environmental awareness training (**MM BIO-1**);
8 biological monitoring and surveying (**MM BIO-2**); and hand removal of
9 vegetation, bird deterrents, and nest surveys (**MM BIO-4**).
- 10 • Swainson's hawk: Suitable nest trees and roosting sites are absent from the
11 Project area and immediate vicinity. Suitable foraging habitat is present in Suisun
12 Marsh and the North Work Area, but not present in the open water areas of the
13 South Work Area or the open water areas area between the North and South
14 Work Areas. Because the Project would not impact nest trees, eggs, or nesting
15 young, injury and mortality of this species is not anticipated.
- 16 • Giant garter snake: The brackish wetlands in the Project area likely preclude the
17 giant garter snake from the majority of the Project area; however, a recent
18 occurrence from a nearby levee road suggests that habitat may be present along
19 levee access roads associated with the Project. Despite this occurrence, the
20 giant garter snake is not likely to occur within the Project area because the
21 species is not known to be associated with brackish or salt water environments
22 present within and adjacent to the Project area. The implementation of MMs that
23 include environmental awareness training (**MM BIO-1**) and biological monitoring
24 and surveying (**MM BIO-2**) would avoid impacts to this species.

25 To ensure that potential impacts to these and other special-status species would be
26 avoided or mitigated to less than significant, the following MMs would be implemented.

27 **MM BIO-1: Environmental Awareness Training.** Chevron Pipe Line Company
28 (CPL) shall ensure that all construction personnel receive mandatory
29 environmental awareness training. The training shall be provided by a qualified
30 biologist, approved by California State Lands Commission (CSLC) staff, prior to
31 start of construction activities, and as new personnel are added to the Project.
32 The environmental awareness training shall familiarize workers with the
33 special-status species and their habitats, explain the regulatory requirements to
34 protect special-status species, and describe measures that must be
35 implemented to avoid and minimize impacts (including observing posted speed
36 limits and maintaining a 15-mile-per-hour limit on unpaved roads). The training
37 materials shall be developed and submitted to CSLC staff for approval at least
38 3 weeks prior to start of Project activities. CPL shall identify a representative as
39 the person for any employee or contractor to contact if a special-status species
40 is observed, and shall provide the contact information for both this
41 representative and the qualified biologist to U.S. Fish and Wildlife Service,

1 California Department of Fish and Wildlife, and CSLC staffs before construction
2 commences. The qualified biologist shall maintain a list of contractors who
3 have received training and shall submit a summary of the awareness training to
4 CSLC staff within 30 days after construction begins and after construction is
5 completed.

6 **MM BIO-2: Biological Monitoring and Surveying.** Chevron Pipe Line Company
7 (CPL) shall ensure that the following surveys and/or monitoring activities are
8 conducted. Surveys shall be conducted by a qualified biologist, approved by
9 California State Lands Commission (CSLC) staff in consultation with California
10 Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service
11 (USFWS), or National Marine Fisheries Service (NMFS) staffs.

- 12 • Pre-Construction Surveys: A pre-construction survey shall be conducted
13 within 15 days prior to the start of construction at the North Work Area and
14 staging areas to ensure that no sensitive species are present.
- 15 • Plant Surveys: Special-status plant surveys shall be conducted during the
16 appropriate blooming period. If any special-status plants are identified,
17 they shall be flagged or fenced for avoidance.
- 18 • Biological Monitoring during Construction: An approved qualified biologist
19 shall be on-site during all ground-disturbance activities at the North Work
20 Area. The biologist shall survey the work area before the start of ground
21 breaking activities each day. The biologist shall have the authority to stop
22 activities in the event that a special-status species is observed. In the
23 event that a special-status species is encountered in the Project area
24 during Project activities, associated work activities at the location shall be
25 halted immediately and CPL shall contact the appropriate agency (i.e.,
26 CDFW, USFWS, NMFS) and CSLC staff to discuss ways to proceed with
27 the Project. Monitoring results shall be summarized in a monthly report
28 and provided to CSLC staff during construction.
- 29 • Migratory Bird Monitoring and Protection Measures: For work conducted
30 within the migratory bird breeding season (February 15 and August 31),
31 the approved qualified biologist shall complete nesting bird surveys within
32 15 days prior to Project implementation to determine if migratory birds
33 protected under the Migratory Bird Treaty Act (MBTA) are nesting in the
34 Project area. Nest surveys shall follow standard biological survey
35 methods, and shall be tailored to detect specific species, with visits
36 planned at appropriate time frames/intervals to detect nesting activity. If
37 nests are found, the Project biologist shall establish an appropriate buffer
38 to be in compliance with the MBTA. To prevent encroachment, the
39 established buffer(s) shall be clearly marked for avoidance and shall
40 remain in effect until the young have fledged or the nest has been
41 abandoned, as confirmed by the Project biologist.
- 42 • If active nests are identified during construction within 50 feet of the North
43 Work Area (or other distance determined through consultation with the

1 USFWS), a biological monitor shall conduct regular (no less than twice per
2 week) surveys of each active nest to monitor the behavior of the nesting
3 bird for signs of stress or potential nest failure. The nest survey must be
4 conducted during active construction, when construction noise is present,
5 and be of sufficient duration to make an appropriate assessment (up to 1
6 hour). The biological monitor shall take care to not cause nest disturbance
7 during monitoring. Weekly reports shall be prepared summarizing the
8 results of the monitoring, behaviors observed, and actions taken, and shall
9 be submitted to the USFWS. If nesting birds are found to exhibit signs of
10 stress or if potential nest failure is suspected, CPL shall obtain
11 authorization from the USFWS to have the nest either relocated or
12 removed by an approved professional. If construction activities are
13 believed to be a direct cause of nest disturbance that may lead to nest
14 failure, construction activities shall be temporarily halted and/or minimized
15 until there is a resolution through one of the means discussed above, until
16 fledging has occurred, or until resumption of construction activities is
17 approved through consultation with the USFWS.

18 **MM BIO-3: Wildlife Exclusion Fencing.** The contractor shall install salt marsh
19 harvest mouse exclusion fencing around the North Work Area under the
20 supervision of the biological monitor. Fencing shall be installed immediately
21 when water levels in the pond allow access to the North Work Area.
22 Unidirectional escape routes shall be installed in the fencing to allow any
23 animals to escape the Project area during construction activities if they are in
24 the work area. The biological monitor shall check the fence at regular intervals
25 to monitor proper installation and report maintenance needs and check for the
26 presence of wildlife. Fence inspection intervals shall be based on the planned
27 construction activities, recent and forecasted weather events, and the results of
28 pre-construction surveys and previous fence checks.

29 **MM BIO-4: Migratory Bird Avoidance.** Between February 1 and February 15
30 (between the end of waterfowl hunting season when the North Work Area is
31 flooded and prior to the start of the migratory bird nesting season when
32 flooding ceases), Chevron Pipe Line Company (CPL) shall initiate ground
33 disturbance activities in the North Work Area. After a pre-activity survey (**MM
34 BIO-2**), the contractor shall trim (using hand tools) the existing vegetation
35 within the work area (as needed to facilitate the placement of filter fabric) and a
36 50-foot buffer around the work area, overlay filter fabric, and potentially install
37 the first layer of base rock for the North Work Area pad. This effort during the
38 non-breeding season, and immediately following the end of the flooding period,
39 shall make the North Work Area unattractive to nesting birds during the nesting
40 season (as well as salt marsh harvest mice that may be moving into the area).
41 Bird deterrents (i.e., foil streamers, decoys, noise) shall be installed in
42 consultation with the resources agencies to detract nesting birds from the
43 Project area and the surrounding area. CPL shall monitor the effectiveness of
44 the deterrents, make regular inspections of the North Work Area, and make
45 modifications to the deterrents as necessary. At least 48 hours prior to
46 installation of the temporary borehole tracking system (e.g., wire coil), a

1 qualified biologist shall complete a nest survey within terrestrial environments
2 along the Horizontal Directional Drilling alignment. Any observed nest will be
3 marked and identified in the field. During the installation of the surface tracking
4 system, a qualified biologist shall accompany the construction personnel to
5 ensure identified nests are avoided along the walking path and placement of
6 the wire. Any nest markings shall be removed by the qualified biologist during
7 the removal of the wire coil tracking system. Monitoring results shall be
8 summarized in a memorandum and provided to California State Lands
9 Commission staff during construction.

10 The Project could also impact special-status plant species including soft bird's-beak and
11 Suisun thistle should they be present at the North Work Area. Although habitat is
12 marginal for rare plants and none were observed during previous site visits, the
13 implementation of **MM BIO-2** would ensure that potential impacts to special-status or
14 rare plant species would be avoided or mitigated to less than significant. In addition,
15 because Project activities are temporary and short term in nature, no permanent
16 impacts are anticipated.

17 South Work Area: Listed fish species with a potential to occur at the South Work Area
18 include Chinook salmon, steelhead, green sturgeon, and delta and longfin smelt.
19 Offshore, barges moored to the work platform would sink and rise with the tides and, as
20 a result, may rest on the bottom during low tides; however, because the tide slowly
21 recedes over an approximately 6-hour period, any fish beneath the barges would have
22 time to swim out of the way. In addition, temporary underwater noise would be created
23 during pile driving activities, which has the potential to impact fish species. This
24 potential impact is analyzed in detail below; however, with the implementation of the
25 suggested MM, and given the short duration of pile driving activities, injury and mortality
26 to listed fish species is not expected to occur. As a result, Project activities in the South
27 Work Area are not expected to cause injury or mortality to special-status fish species.

28 Staging Areas: Due to the existing disturbed conditions and lack of habitat within the
29 staging areas, special-status species are not expected to occur, and injury and mortality
30 to special-status species are not anticipated.

31 Access Roads: Special-status species are generally not expected to use the access and
32 levee roads except temporarily when moving from one area to another. While it is not
33 expected that the movement of heavy equipment, daily worker trips, and materials
34 deliveries on these roads would result in impacts to most special-status species, there
35 was one recent observation, as described above, of a giant garter snake from a nearby
36 levee road. As a result, there is a potential for injury and mortality should special-status
37 species, like the giant garter snake, be present on access and levee roads during
38 vehicle trips to and from the Project area; however, implementation of **MM BIO-1** and
39 **MM BIO-2** would ensure that potential impacts to these species would be avoided or
40 mitigated to less than significant.

1 Summary of Injury and Mortality: As described above, the potential for the injury and
2 mortality of special-status species varies by species and work area locations; however,
3 the potential for these effects would be temporary, short in duration, and occur over a
4 small geographic area. In addition, suitable habitats and other similar habitats are
5 abundant in the region. Injury and mortality of fully protected species (e.g., salt marsh
6 harvest mouse, California black rail) would be avoided through the implementation of
7 MMs. Given the information above and the implementation of **MM BIO-1**, **MM BIO-2**,
8 **MM BIO-3**, and **MM BIO-4**, including minimizing impacts to vegetation and post-Project
9 site restoration (**MM BIO-5** and **MM BIO-6**, respectively, below), potential impacts to
10 special-status species resulting in injury or mortality would be avoided or mitigated to
11 less than significant.

12 3.4.4.2 Temporary Habitat Disturbance

13 **Less than Significant with Mitigation.** While the Project would temporarily disturb
14 habitat in the Project area, no permanent habitat loss would occur. In the North Work
15 Area, for example, Project activities would make certain habitats such as wetland
16 habitat temporarily unavailable to special-status species. However, these areas of
17 temporary habitat disturbance would be relatively small compared to the total area of
18 similar habitat in Honker Bay and Suisun Marsh. Potential impacts resulting in
19 temporary habitat disturbance include the temporary removal of vegetation, shading of
20 Honker Bay, and disturbance to the bay floor. No impacts to levee roads are expected
21 beyond maintenance to the surface of the roads in some areas.

22 Vegetation Disturbance: Temporary habitat disturbance would occur at the North Work
23 Area for the construction of the work pad. While most of the terrestrial special-status
24 species have low potential to occur in North Work Area, salt marsh harvest mouse,
25 migratory birds (e.g., California black rail, Swainson's hawk), and special-status plants
26 may be impacted during construction of the pad. Potential impacts to salt marsh harvest
27 mouse and migratory birds would be avoided or mitigated to less than significant
28 through the implementation of **MM BIO-1** through **MM BIO-4**, in addition to **MM BIO-5**
29 and **MM BIO-6**, below. In addition to the implementation of **MM BIO-2**, potential impacts
30 to special-status plants would be avoided or mitigated to less than significant through
31 the implementation of the following MMs.

32 **MM BIO-5: North Work Area Vegetation Impact Minimization Plan.** At least 2
33 weeks prior to the start of construction, Chevron Pipe Line Company shall
34 submit to California State Lands Commission (CSLC) staff for approval, and
35 shall subsequently implement, a North Work Area Vegetation Impact
36 Minimization Plan. The Plan shall include at least the following elements.

- 37 • The North Work Area shall not be graded for construction of the pad.
- 38 • In order to preserve the roots and seedbank of plant species, vegetation
- 39 shall be trimmed with hand tools to just above ground level in the work

1 area (as needed) as well as in a 50-foot buffer, leaving rootstock in
2 place. The trimmed material shall be left in place on the ground or
3 stockpiled to be replaced after removal of the pad materials at the end of
4 construction. Per **MM BIO-2**, pre-construction surveys and biological
5 monitoring shall be conducted during vegetation trimming.

- 6 • Vegetation shall only be excavated in the drill entry and tie-in pit
7 (maximum size 10 feet by 12 feet by 6 feet). Vegetation and soil from the
8 excavated pit shall be salvaged and stockpiled separately to be replaced
9 during site restoration.

10 **MM BIO-6: Revegetation and Monitoring Plan.** Following completion of Project
11 construction, Chevron Pipe Line Company (CPL) shall restore the area to pre-
12 Project conditions in accordance with a Revegetation and Monitoring Plan. At
13 least 2 weeks prior to conclusion of construction, CPL shall submit the Plan to
14 California State Lands Commission (CSLC) staff for approval. The Plan shall
15 include details for site preparation and revegetation methods, monitoring,
16 performance criteria, and reporting. These elements are subject to modification
17 through consultation with natural resource agencies.

- 18 • Site Preparation and Revegetation: All equipment, geotextile mats, rock
19 fill, and filter fabric shall be removed. Any stockpiled native vegetation
20 trimmings (that were trimmed at the beginning of construction) shall be
21 reapplied over temporarily disturbed wetlands to provide temporary soil
22 protection and as a seed source. The drill pit shall be backfilled with the
23 stockpiled material originally excavated from the pit. Subsoil shall be
24 replaced in the pit and compacted with machinery. After proper backfilling
25 of the subsoil, the upper 6 inches of topsoil shall be replaced and spread
26 evenly over the pit. Topsoil shall not be mixed with subsoil or used to fill
27 the pit. The contractor shall also apply appropriate erosion control
28 treatment as needed to any disturbed ground prior to the end of the
29 construction season.
- 30 • Monitoring: After construction, a qualified biologist shall monitor the
31 hydrologic conditions and the vegetation cover and composition. Monitoring
32 shall occur annually for the first 3 to 5 years following revegetation (expected to be 2018 to 2022) with a provision that cessation
33 of monitoring may be requested by CPL if performance criteria for year 5
34 is met earlier. Restored areas shall be monitored to achieve end-points as
35 agreed upon with the agencies.
- 36 • Performance Criteria: Revegetation of wetlands shall be deemed
37 successful if total plant cover is greater than 70 percent of adjacent
38 undisturbed areas, at least 1-3 dominant species are presented, and there
39 is no increasing trend in invasive, non-native species relative to the
40 adjacent undisturbed areas. Performance criteria may be revised at the
41 request and in consultation with natural resource agencies.
- 42 • Reporting: Annual reports and a final monitoring report shall be submitted
43 to the CSLC staff by December 31 of each monitoring year (until CSLC
44

1 monitoring obligations are complete) or as determined in coordination with
2 natural resources agencies. At their request, copies shall also be provided
3 to San Francisco Bay Conservation and Development Commission,
4 California Department of Fish and Wildlife, Regional Water Quality Control
5 Board, U.S. Army Corps of Engineers, and U.S. Fish and Wildlife Service
6 staffs.

7 Installation of the temporary borehole tracking system wire coils would occur in the area
8 between the North and South Work Areas. While most of this area is open water, some
9 areas of emergent vegetation are present. Because the borehole tracking system is
10 temporary, there would be no permanent alteration of marsh habitat. However, to
11 ensure that potential impacts to emergent vegetation would be avoided or mitigated to
12 less than significant, the following MM would be implemented.

13 **MM BIO-7: Emergent Wetland Vegetation Avoidance.** Installation of the
14 temporary borehole tracking system (e.g., wire coils) shall be conducted from
15 vessels in open water areas in a manner that avoids driving over or through
16 emergent wetland vegetation. The biological monitor shall provide
17 recommendations for personnel access for the installation and alignment of the
18 tracking system around emergent wetland vegetation in a manner that reduces
19 or minimizes impacts on emergent wetland vegetation. A biological monitor
20 may be present on the vessel or onshore during the installation of the wire coil
21 to point out and document avoidance of the emergent wetland vegetation.
22 Monitoring results shall be summarized in a memorandum and provided to
23 California State Lands Commission staff during construction.

24 Shading: The platform and mud barge would result in shading an approximately 0.5-
25 acre area of Honker Bay during the 3-month construction period. The resulting shade
26 has the potential to reduce the amount of energy available for photosynthesis by
27 phytoplankton in the immediate area; however, because of the tidal fluctuations and
28 currents that move through Honker Bay, planktonic organisms are not expected to
29 reside beneath the platform or barge for a great length of time. Additionally, the small
30 potential for the reduction in photosynthesis is not expected to measurably reduce
31 phytoplankton densities in Honker Bay or result in food-chain effects to zooplankton
32 species that listed fish species may feed on. Shading from overwater structures can
33 also create “behavioral barriers” that can deflect or delay fish movement and increase
34 predation rates of certain fishes (Haeseker et al. 1996); however, as described above,
35 the area of shade would be temporary and is small relative to the size of Honker Bay.
36 Therefore, the potential impact of Project-related over-water shading on listed fish
37 species is expected to be less than significant.

38 Bay Floor Disturbance: A small area of habitat (41 square feet [.0001 acre]) for aquatic
39 special-status species would be temporarily disturbed when H-piles and untreated wood
40 piles are installed at the South Work Area. Additionally, the mud barge (moored to the
41 work platform) and other support barges may rest on the bay bottom during low tides

1 due to the depth of their drafts. Therefore, between 0.2 and 0.6 acre of bay floor would
2 be unavailable to aquatic organisms, including special-status fish, during low tides. Due
3 to the relatively small area of disturbance compared to the total area of Honker Bay and
4 the temporary nature of the Project, the potential impact of Project-related bay floor
5 disturbance on listed fish species is expected to be less than significant.

6 Temporary Night-lighting: While the majority of Project-related construction would occur
7 during daylight hours, pulling the assembled pipe segment through the drilled hole must
8 be conducted in one continuous operation, which is anticipated to take approximately 24
9 hours. Consequently, portable temporary lighting would be used for one or two nights
10 during this activity. Potential effects to wildlife (e.g., birds, turtles, fish, and insects) in
11 the Project area include disorientation and interruption of natural behaviors. However,
12 given the temporary use of night-lighting and the implementation of **MM AES-1**, which
13 would shield and direct the light downward toward the work area, potential impacts to
14 wildlife would be avoided or mitigated to less than significant.

15 Summary of Temporary Habitat Disturbance: As described above, temporary habitat
16 disturbances that could affect special-status species would result from Project-related
17 activities, including placement of the North Work Area, shading, barges temporarily
18 resting on the bay floor; and night-lighting during pipe pullback activities; however, the
19 potential for these effects would be temporary, short in duration, and occur over a small
20 geographic area. Given the information above and the implementation of **MM BIO-4**,
21 **MM BIO-5**, **MM BIO-6**, **MM BIO-7**, and **AES-1**, including post-Project site restoration,
22 temporary habitat disturbance would be avoided or mitigated to less than significant.

23 3.4.4.3 Water Quality

24 **Less than Significant with Mitigation.** Project activities would potentially affect water
25 quality and thus biological resources as a result of spills of materials used during
26 construction (e.g., oils, transmission and hydraulic fluids, fuel) or by generating turbidity.
27 Materials used during construction could accidentally spill and enter the bay if spilled
28 from the South Work Area or through the tidal marsh in areas adjacent to the North
29 Work Area. The introduction of pollutants to the bay or marsh may harm special-status
30 species if the pollutants cause a reduction in available prey abundance or if
31 contaminated prey are consumed by special-status species. To minimize the potential
32 for impacts due to accidental spills during construction, **MM HWQ-1** (see Section 3.9,
33 Hydrology and Water Quality) would be implemented to ensure that potential impacts to
34 special-status species would be avoided or mitigated to less than significant.

35 Generation of minor levels of turbidity is expected during the installation and removal of
36 piles and the 20-inch-diameter steel casing, removal and replacement of the concrete
37 mats, and barges resting on the bay floor during low tide at the South Work Area.
38 Turbidity and sedimentation impacts would be temporary, short in duration, and

1 localized; thus the Project would not likely have a substantial adverse effect on special-
2 status species. However, to ensure that any potential impacts to special-status species
3 resulting from turbidity and sedimentation would be avoided or minimized to less than
4 significant, **MM HWQ-1** (see Section 3.9, Hydrology and Water Quality) and the
5 following MM would be implemented.

6 **MM BIO-8: Turbidity and Sedimentation Minimization.** Sediment suspension
7 shall be minimized when removing piles. Measures to accomplish this shall
8 include, but are not limited to, the following:

- 9 • When practicable, piles shall be removed with a vibratory hammer.
- 10 • Piles shall be removed slowly to allow sediment to slough off at, or near,
11 the mudline.
- 12 • Excess mud that may cling to the extracted piles shall not be washed into
13 the bay.
- 14 • Removed piles shall be placed on a barge equipped with a basin to
15 contain attached sediment and runoff water after removal.

16 3.4.4.4 Noise

17 **Underwater Noise**

18 **Less than Significant with Mitigation.** Underwater noise that could affect in-water
19 special-status species, including Chinook salmon, steelhead, green sturgeon, and
20 longfin and delta smelt, would be generated during installation and later de-construction
21 of the 200-by-50-foot pile-supported platform and the 20-inch-diameter steel casing in
22 the South Work Area. Piles would be driven into the bay floor using vibratory and impact
23 pile driving methods; the steel casing would be installed using a pneumatic pipe ram,
24 whose physical properties are similar to an impact pile driver. Sound and acoustic
25 pressure resulting from impact and vibratory pile driving could cause behavioral
26 avoidance of the construction area and/or injury. Therefore, the potential impacts of
27 Project-related underwater noise are discussed below.

28 *Differences between Impact and Vibratory Pile Driving*

29 Impact pile driving includes a piston system with weights that are usually raised by a
30 power source (e.g., diesel, hydraulic, or steam) then dropped onto the pile, hammering
31 the pile into the ground. In vibratory pile driving, a vibrator case is attached to the pile
32 that is to be installed and vibrations are then transferred from the case to the pile using
33 hydraulic, electric, or pneumatic power packs (Warrington 1992; Stuedlein and Meskele
34 2013). A vibratory driver works by inducing particle motion to the substrate immediately
35 below and around the pile, causing liquefaction and allowing the pile to sink downward
36 (for this reason, vibratory pile driving is suitable only where soft substrates are present).
37 The noise produced during vibratory driving is lower in intensity and can be considered

1 continuous in comparison to the impulsive noise produced during impact pile driving.
2 Because vibratory pile drivers generally produce less sound than impact pile drivers,
3 they are often employed as a MM to reduce the potential for adverse effects on fish that
4 can result from impact pile driving (Caltrans 2015).

5 *Fundamentals of Underwater Noise*

6 Sound is a physical phenomenon consisting of minute vibrations that travel through a
7 medium such as air or water. Sound is generally characterized by several variables,
8 including frequency and intensity. Frequency describes the pitch of a sound and is
9 measured in hertz while intensity describes the loudness of a sound (i.e., sound
10 pressure level [SPL]) and is measured in decibels (dB). Decibels are measured using a
11 logarithmic scale (e.g., a 10-dB increase represents a 10-fold increase in sound
12 intensity). Sound intensity for underwater applications is typically expressed in dB
13 referenced to 1 microPascal (μPa). Sound may be measured as either an instantaneous
14 value (in this context peak SPL) or as the total sound energy present in a sound event
15 (i.e., sound exposure level [SEL], which is a common unit of total sound energy used in
16 acoustics to describe short-duration events). The SEL is the total sound energy in an
17 impulse that accumulates over the duration of that pulse normalized to 1 second, thus
18 the unit for SEL is dB referenced to $1 \mu\text{Pa}^2\text{-s}$. Peak SPL and SEL are used by resource
19 agencies to assess the effects of underwater noise on fish.

20 *Applicable Noise Criteria for Fish*

21 In 2008, the Fisheries Hydroacoustic Working Group (FHWG)⁶ issued interim threshold
22 criteria based on best available science for the onset of injury to fish from noise
23 generated during impact pile driving (FHWG 2008). The FHWG determined that noise at
24 or above the 206 dB (peak) SPL threshold, which applies to fish smaller than or greater
25 than or equal to 2 grams (Table 3.4-2), can cause barotrauma to auditory tissues, the
26 swim bladder, or other sensitive organs. Noise levels above the cumulative SEL may
27 cause temporary hearing thresholds shifts in fish. Behavioral effects (e.g., fleeing the
28 area or temporary cessation of feeding or spawning behaviors) are not covered under
29 these criteria, but could occur at these levels or lower. Although these criteria are not
30 formal regulatory standards, they are generally accepted as viable criteria to evaluate
31 the potential for injury to fish from pile driving. Because these criteria were developed
32 for impact pile driving only, and there are no established criteria for vibratory pile driving
33 (Caltrans 2015), the interim criteria for impact pile driving will be used for both pile
34 driving methods in this analysis.

⁶ Members of the FHWG include: NMFS's Southwest and Northwest Divisions; California, Washington, and Oregon Departments of Transportation; CDFW; and U.S. Federal Highway Administration.

Table 3.4-2. Interim Thresholds for Onset of Injury in Fish from Impulse Noise

	Peak Noise (SPL) (dB)	Accumulated Noise (SEL) (dB)
Less than 2 grams	206	183
Greater than or equal to 2 grams	206	187

Source: FHWG 2008.

Acronyms: dB = decibel; SEL = sound exposure level; SPL = sound pressure level.

Note: There are no formal criteria for continuous noise. The impulse noise thresholds are commonly applied for continuous noise in the absence of a specific threshold.

1 Special-status species expected in the Project area during construction include Chinook
 2 salmon, steelhead, green sturgeon, delta smelt, and longfin smelt. Given the life cycle
 3 stages expected to be present during the construction period (May to July), it is
 4 expected that Chinook salmon, steelhead, and green sturgeon would be over 2 grams
 5 in weight, but delta and longfin smelt may be less than 2 grams.

6 *Estimation of Pile Driving Noise*

7 To estimate underwater noise levels for Project-related pile driving activities,
 8 measurements from a number of underwater pile driving projects conducted under
 9 similar circumstances (i.e., similar water depths in areas of similar substrate) were
 10 reviewed for source-level data (for pile driving, source-level measurements are typically
 11 normalized to a distance of 10 m from the pile). These analyses also assumed that fish
 12 would be stationary during pile driving (i.e., would not relocate away from the source)
 13 and that all pile strikes would produce noise at the maximum peak SPL and SEL.
 14 Therefore, these calculations, as shown in Table 3.4-3, represent the worst-case
 15 scenario for accumulated sound effects over a 24-hour period in the Project area. In
 16 addition to using site-specific water depths and substrate types, this analysis uses the
 17 practical spreading loss model, which NMFS and USFWS have accepted to estimate
 18 transmission loss of sound through water.

19 *Potential Effects of Pile Driving Noise on Fish*

20 The 206 dB (peak) SPL noise criteria for injury to fish would not be exceeded by impact
 21 or vibratory pile driving activities, and no physical injury to fish (i.e., barotrauma) is
 22 expected. However, the 187 dB and 183 dB cumulative SEL criteria would be
 23 exceeded, but only near the pile being driven. These distances to these thresholds from
 24 example piles are shown on Figure 3.4-2 and Figure 3.4-3.

Table 3.4-3. Expected Pile Driving Noise Levels and Distances of Criteria Level Exceedance with Vibratory and Impact Drivers

Pile Type	Maximum Source Levels (dB) ¹			Distance to Threshold ^{2,3} (feet)		
	Peak SPL	SEL, Single Strike ⁴	SEL, Cumulative	206 dB Peak SPL	187 dB SEL	183 dB SEL
Impact Pile Driving						
Pneumatic pipe ram on 20-inch-steel pipe (one installed)	177	152	185	NE	24	40
14-inch-wide H pile proofing (three per day)	187	154	169	NE	NE	NE
Vibratory Pile Driving/Extraction						
14-inch steel H pile installation (10 per day)	177	152	190	NE	48	82
14-inch steel H pile removal (10 per day)	177	152	187	NE	32	55
12-inch wood pile installation (15 per day)	164	150	189	NE	40	69
12-inch wood pile removal (15 per day)	164	150	186	NE	27	46
20-inch pipe removal (one removed)	201	169	197	NE	123	212
<p>Acronyms: dB = decibel; NE = threshold not exceeded; SEL = sound exposure level; SPL = sound pressure level.</p> <p>Notes:</p> <p>¹ Measured 10 meters from source.</p> <p>² The distance from the pile over which the effects threshold of 206 dB (peak) SPL and 187 dB/183 dB cumulative SEL would be exceeded. The SEL threshold values apply to fish over 2 grams in weight, and fish less than 2 grams in weight, respectively.</p> <p>³ Analysis assumes an attenuation factor of 17 (approximately 5 dB per doubling of distance) in the Project area. This is a conservative value for attenuation in shallow water (depths of less than 45 feet); the attenuation would likely be greater than 17 (Caltrans 2015).</p> <p>⁴ For vibratory driving, the “SEL, Single Strike” represents the SEL of one second of pile driving.</p>						

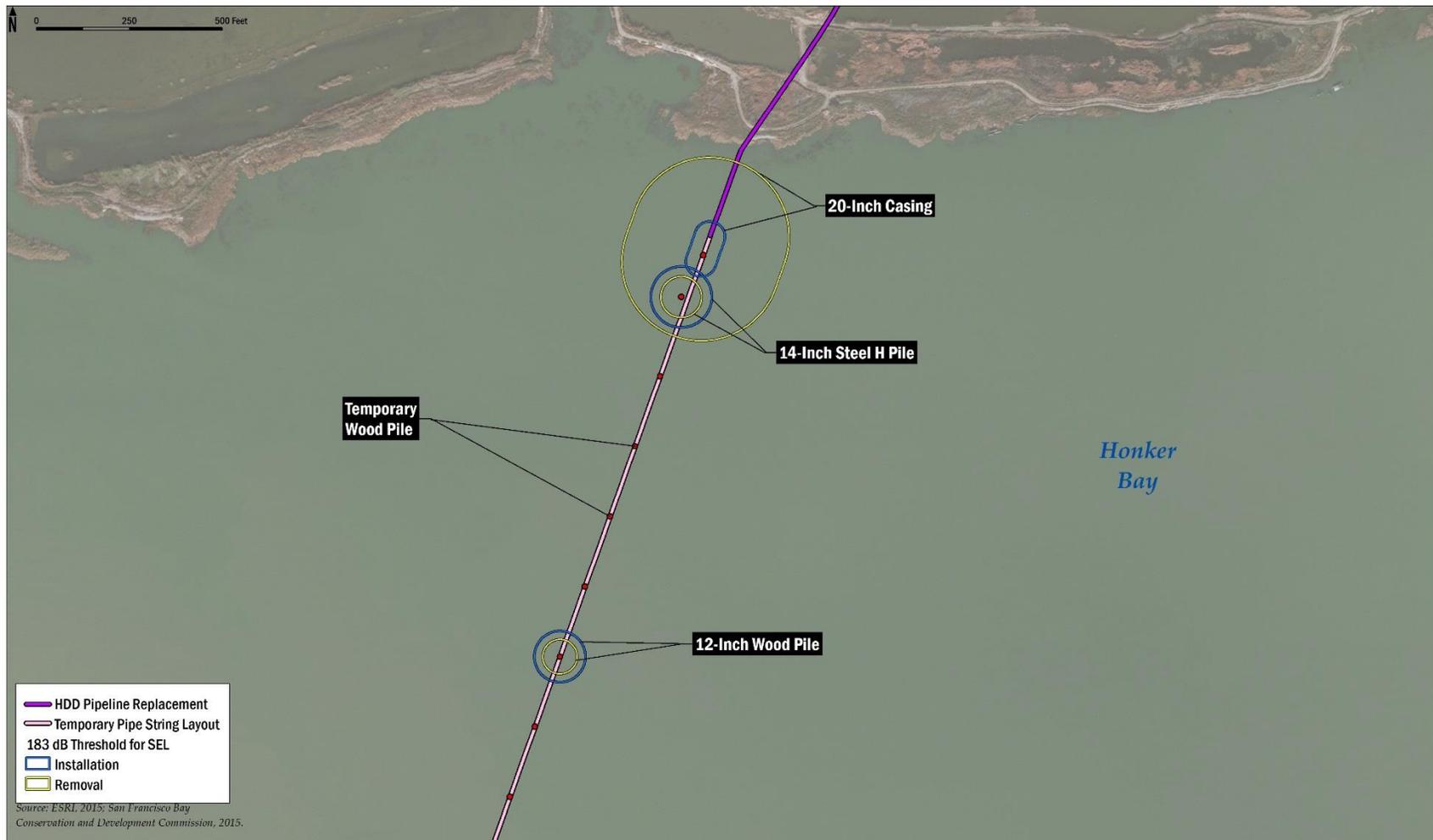
1

Figure 3.4-2 Underwater Noise Impact Areas (187 dB Cumulative SEL)



1

Figure 3.4-3 Underwater Noise Impact Areas (183 dB Cumulative SEL)



1 In areas where the cumulative SEL threshold would be exceeded, fish could experience
2 temporary shifts in hearing thresholds and behavioral effects, which could result in the
3 temporary cessation of feeding or movement out of the area during active pile driving.
4 Such shifts in hearing thresholds would result from temporary injury to the hair cells that
5 detect pressure changes. Fish are expected to recover from such temporary injury
6 within 24 hours, which is the interval used by NMFS to determine cumulative noise
7 effects on fish. Behavioral effects may also occur in areas beyond the cumulative SEL
8 threshold where the underwater noise is still audible to fish. This would apply to both
9 special-status fish species and EFH species. Depending on the rate at which piles are
10 installed and removed, pile driving would occur for 10 to 20 days at the start and end of
11 the construction period. The cessation of pile driving at the end of each work day would
12 allow cumulative noise levels to reset before pile driving continues the following day.
13 Following cessation of pile driving, fish are expected to resume use of the area.
14 Because of the shallow water depths in the vicinity (approximately 10 feet or less),
15 attenuation rates likely would be higher than modeled in this analysis, which would
16 decrease the affected area.

17 To ensure that potential impacts to special-status fish species would be avoided or
18 mitigated to less than significant, the following MM would be implemented.

19 **MM BIO-9: Pile Driving Soft-Start Technique.** A soft start for vibratory drivers
20 requires contractors to initiate the driver at a reduced energy for 15 seconds
21 followed by a 30-second waiting period; this procedure is then repeated two
22 additional times. A soft start for impact drivers requires contractors to provide
23 an initial set of strikes at a reduced energy followed by a 30-second waiting
24 period; this procedure is then repeated two additional times. A soft start shall
25 be implemented before pile driving begins each day and any time following the
26 cessation of pile driving for 30 minutes or longer.

27 **Airborne Noise**

28 **Less than Significant.** The primary sources of noise associated with the Project are
29 the construction and use of the North and South Work Areas, and the advancement of
30 the HDD boring equipment along the alignment. Airborne noise resulting from pile
31 driving, pipe ramming, drilling, equipment operation, and generators could affect
32 terrestrial animals by causing temporary behavioral avoidance of the construction area
33 or potentially temporary loss of hearing capacity. Because construction would occur
34 during the nesting season for birds, it may potentially affect nesting migratory birds and
35 listed bird species such as Ridgway's rail if they are present in the Project area.
36 Therefore, the potential impacts of Project-related noise on birds is discussed below.

37 While there are no official criteria for airborne noise thresholds for birds, Caltrans has
38 recommended interim guidelines to assess noise effects on birds. Those thresholds,
39 which are presented in Table 3.4-4, are used in this analysis. The in-air noise values

1 presented here are referenced to 20 µPa, which is usually considered the threshold of
 2 human hearing (roughly the sound of a mosquito flying 10 feet away) and commonly
 3 used to describe airborne noise.

Table 3.4-4. Interim Guidelines for Potential Noise Effects on Birds

Noise Type	Hearing Damage	Temporary Threshold Shift ¹
Multiple Impulse (Pile Driver, Pipe Ram)	125 dBA	N/A
Continuous Noise (Drilling, Construction)	125 dBA	93 dBA

Source: Adapted from Dooling and Popper (2007).
Acronyms: dBA = A-weighted decibel; N/A = no data available.
Note: ¹ A temporary threshold shift is a temporary, reversible increase in the threshold of audibility at a specific range of frequencies.

4 Ambient noise levels at the North and South Work Areas are expected to be low since
 5 no major roads, shipping channels, or urban areas are in the vicinity. The construction
 6 equipment that would be used in the Project area generally produces sound levels from
 7 approximately 72 to 88 dBA (PG&E 2013; CPUC 2009); however, the pneumatic pipe
 8 ram that would be used to install the 20-inch-diameter steel casing at the South Work
 9 Area can generate airborne noise levels up to 97 dBA at 4 meters (TT Technology
 10 2015). Project activities in the North Work area would not generate noise levels above
 11 the 93 dBA threshold and, therefore, would not cause special-status bird species near
 12 the Project area to experience hearing damage or temporary threshold shifts. In the
 13 South Work Area, the pneumatic pipe ram would generate noise above the 93 dBA
 14 threshold, but below the 125 dBA threshold for hearing damage; however, such noise
 15 levels would be limited to over-water areas around the South Work Area, away from
 16 nesting birds. Construction noise at both work areas may cause birds, including
 17 migratory birds, to avoid the work areas; however, the potential for these effects would
 18 be temporary, short in duration, and occur over a small geographic area. Given the
 19 information above, airborne noise impacts to birds would be less than significant.

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

24 **Less than Significant with Mitigation.** The Project may result in impacts to critical
 25 habitat, EFH, and HAPC. No impacts to these designated areas are anticipated within
 26 the North Work Area, staging areas, access roads, or offloading area.

27 Project-related activities (e.g., construction/removal of the temporary work platform,
 28 HDD) in the South Work Area would result in the temporary disturbance of a small area
 29 of critical habitat for Sacramento River winter-run Chinook salmon, green sturgeon, and
 30 delta smelt. In addition, these activities would result in short-term disturbances to a

1 small amount of subtidal, benthic habitat within Honker Bay identified as an EFH/HAPC.
 2 The impacts to EFH/HAPC would be greatest in magnitude during construction and
 3 deconstruction of the platform in the South Work Area; however, these impacts would
 4 diminish following Project construction as the area gradually returns to its natural state.
 5 Following Project completion, all construction materials and equipment would be
 6 removed from the Project area, and the area would be restored to pre-Project
 7 conditions; no long-term adverse effects to critical habitat, EFH, or HAPC would occur.
 8 Localized, short-term effects as a result of Project-activities would be minimized through
 9 implementation of **MM BIO-1** through **MM BIO-9** described above, and **MM HWQ-1** in
 10 Section 3.9, Hydrology and Water Quality. With the implementation of these measures,
 11 Project impacts to critical habitat, EFH and HAPC are not expected to result in
 12 substantial adverse effects; therefore, this impact would be considered less than
 13 significant with mitigation.

14 ***c) Have a substantial adverse effect on federally protected wetlands as defined***
 15 ***by Section 404 of the Clean Water Act (including, but not limited to, marsh,***
 16 ***vernal pool, coastal, etc.) through direct removal, filling, hydrological***
 17 ***interruption, or other means?***

18 **Less than Significant with Mitigation.** Wetlands and other waters of the United States
 19 would be temporarily impacted during Project activities, including the construction of the
 20 North and South Work Areas. Table 3.4-5 summarizes the area of impact to wetlands
 21 and other waters from construction of the North Work Area and the installation of the
 22 temporary work platform and support barge at the South Work Area.

Table 3.4-5. Summary of Impacts to Wetlands and Other Waters

Waters of the U.S.	Area Temporarily Impacted (acres)
Wetlands (North Work Area)	1.41
Other Waters (South Work/Pipe String Areas)	0.67 ¹
Total	2.08
Note: ¹ Approximately 0.17 acre of the fill in “Other Waters” is associated with removal and replacement of the existing and previously permitted concrete mats covering the Bay Area Pipeline in Honker Bay. The USACE considers this “fill” for permitting purposes; however, it does not represent a net change in fill, loss of waters due to fill from Project activities, or change in habitat from existing conditions.	

23 Impacts to wetlands and other waters as a result of Project activities would be
 24 temporary, short-term in duration, would result in no net change in permanent impacts.
 25 In addition, implementation of **MM BIO-1**, **MM BIO-2**, **MM BIO-5** through **MM BIO-8**,
 26 and **MM HWQ-1** would further reduce these temporary, short-term impacts. Therefore,
 27 this impact would be less than significant with mitigation.

28 ***d) Interfere substantially with the movement of any native resident or migratory***
 29 ***fish or wildlife species or with established native resident or migratory wildlife***
 30 ***corridors, or impede the use of native wildlife nursery sites?***

1 **Less than Significant Impact.** The Project may result in minor effects to the movement
2 of terrestrial wildlife and aquatic fish species due to construction activities, particularly
3 those activities that involve noise (i.e., pile driving). Species may avoid the immediate
4 area during construction; however, this is not expected to impede fish or wildlife
5 migration or interfere substantially with movement of species within Suisun Marsh.
6 These effects are anticipated to be temporary, short term in nature, and limited to a
7 small area of disturbance. For these reasons the Project would not substantially
8 interfere with movement of migratory fish or wildlife species or impede the use of native
9 wildlife nursery sites; therefore, the impact would be less than significant.

10 ***e) Conflict with any local policies or ordinances protecting biological resources,***
11 ***such as a tree preservation policy or ordinance?***

12 **Less than Significant with Mitigation.** The County implements the Suisun Marsh
13 Local Protection Program, which seeks to preserve and enhance the diversity of wildlife
14 and aquatic habitats in Suisun Marsh and surrounding upland areas, and the Solano
15 County General Plan, which identifies additional goals, objectives, and policies
16 regarding the protection of biological resources. As discussed under Checklist Items **a)**
17 through **c)** above, the Project could affect special-status species, sensitive habitats,
18 wetlands, and other biological resources; however, any impacts would be temporary,
19 short in duration, and would occur over a relatively small area. With implementation of
20 **MM BIO-1** through **MM BIO-9**, in accordance with all regulatory permits, the Project
21 would not conflict with any local policies or ordinances protecting biological resources.
22 Therefore, this impact would be less than significant with mitigation.

23 ***f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural***
24 ***Community Conservation Plan, or other approved local, regional, or State***
25 ***habitat conservation plan?***

26 **Less than Significant with Mitigation.** The Project is consistent with the Suisun Marsh
27 Habitat Management, Preservation, and Restoration Plan and associated EIR in that it
28 would replace a portion of the BAPL and would protect the marsh over the long term
29 and ensure the health, safety, and welfare of the public in the Bay Area (e.g., a MM in
30 the EIR requires testing, repair, or replacement of pipelines that have potential for
31 failure). Project compliance would occur pursuant to permits issued by the San
32 Francisco Bay Conservation and Development Commission (BCDC) and other
33 regulatory agency approvals (e.g., USFWS, NMFS, U.S. Army Corps of Engineers, and
34 San Francisco Bay Regional Water Quality Control Board [SFBRWQCB]). The Project
35 would conflict with the provisions of the Suisun Marsh Habitat Plan, which identifies a
36 construction work window of June 15 to October 1 for restoration work carried out under
37 the plan; however, the plan also provides that work outside this period could be
38 conducted, but that it would require additional approval from the resource agencies
39 (e.g., BCDC, CDFW, NMFS, and USFWS). The Project is also consistent with the intent

1 of the Primary Management Zone (to remain an existing marsh and retain its associated
2 uses).

3 Although the Project would have impacts to biological resources within Suisun Marsh,
4 they would be temporary, short in duration, and relatively small in size. With
5 implementation of **MM BIO-1** through **MM BIO-9**, including post-Project site restoration,
6 no change in the existing marsh and its associated uses would occur. Therefore, this
7 impact would be considered less than significant with mitigation.

8 **3.4.5 Mitigation Summary**

9 Implementation of the following MMs would reduce the potential for Project-related
10 impacts to Biological Resources to less than significant.

- 11 • MM BIO-1: Environmental Awareness Training
- 12 • MM BIO-2: Biological Monitoring and Surveying
- 13 • MM BIO-3: Wildlife Exclusion Fencing
- 14 • MM BIO-4: Migratory Bird Avoidance
- 15 • MM BIO-5: North Work Area Vegetation Impact Minimization Plan
- 16 • MM BIO-6: Revegetation and Monitoring Plan
- 17 • MM BIO-7: Emergent Wetland Vegetation Avoidance
- 18 • MM BIO-8: Turbidity and Sedimentation Minimization
- 19 • MM BIO-9: Pile Driving Soft-Start Technique
- 20 • MM AES-1: Night-lighting Spillage Minimization
- 21 • MM HWQ-1: Stormwater Pollution Prevention Plan (SWPPP)

1 **3.5 CULTURAL AND PALEONTOLOGICAL RESOURCES**

CULTURAL AND PALEONTOLOGICAL RESOURCES – Would the Project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code § 21074?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2 **3.5.1 Environmental Setting**

3 The Northwest Information Center (NWIC) of the California Historical Resources
 4 Information System at Sonoma State University maintains site records for known
 5 cultural resource locations and related studies for Solano County. A records search was
 6 conducted by AECOM on June 9, 2015, (File No. 14-1740) and February 17, 2016, (File
 7 No. 15-1180) for cultural resource sites and studies using a 0.5-mile radius around the
 8 Project site (i.e., study area). This study area includes a stretch of Wheeler Island south
 9 of the Roaring River Slough to the northern shore of Honker Bay; a small portion of
 10 Hammond Island north of the slough west of Rack Creek; and a small area just
 11 downstream from the Suisun Marsh Salinity Control Structure along Montezuma
 12 Slough. The study area primarily consists of undeveloped marshland, bay mud, alluvial
 13 soils, sloughs, and dirt roads. It is possible that Late Pleistocene (126,000 to 11,700
 14 years ago) alluvial fan deposits underlie the Holocene bay mud deposits at depth, which
 15 could contain important vertebrate fossils; however, a records search at the University
 16 of California, Berkeley Museum of Paleontology’s catalog did not identify any previously
 17 recorded fossil localities in the vicinity of the Project area.

18 During the records searches conducted on June 9, 2015, and February 17, 2016, one
 19 previously recorded cultural resource was identified within the study area and five
 20 previously recorded cultural resources were identified within a 0.5-mile radius of the
 21 study area (Table 3.5-1). These records searches indicated that the study area has
 22 been included in four previous studies (see Table 3.5-2).

Table 3.5-1. Records Search Results

Resource	Description	Results
P-48-990, Initial Facilities ¹	Comprised of three structures: Roaring River Distribution System, Morrow Island Distribution System, and Goodyear Outfall. Facilities were authorized in 1978 as the first steps to protect Suisun Marsh from encroaching salinity.	Does not appear to be a historical resource for the purposes of CEQA (Brookshear 2013a). ³
BAPL-1 ²	Located at the edge of Honker Bay and consists of a “shipwreck and other historical remains” (Anthropological Studies Center [ASC] 1998a).	Not officially recorded on California Department of Parks and Recreation 523 Forms due to deep mud and flooding. Has not been formally evaluated for significance under CEQA, but is outside of area of potential impacts for the Project.
P-48-981, Grizzly Island Road ²	The longest of the County- maintained public roads within Suisun Marsh and provides access to the marsh’s interior islands. As with most roads within the marsh, the road is raised on levee embankments on Grizzly Island.	Does not appear to be a historical resource for the purposes of CEQA (Brookshear 2013b). ³
P-48-985, Suisun Marsh Gates ²	Water control gates that flood and drain the lands of the duck hunting clubs and the public agency land within the marsh. Gates are concentrated along the Goodyear Slough and scattered through the western marsh.	Does not appear to be a historical resource for the purposes of CEQA (Brookshear 2013c). ³
P-48-986, Suisun Marsh Pumps ²	Located throughout the marsh within the channel of a slough to pump water out.	Does not appear to be a historical resource for the purposes of CEQA (Brookshear 2013d). ³
P-48-991, Suisun Marsh Salinity Control Gate ²	Spans Montezuma Slough north of Roaring River Slough at the southeastern end of Montezuma Slough. Gate includes three components: a set of radial gates, a removable flashboard gate, and a boat lock.	Does not appear to be a historical resource for the purposes of CEQA (Brookshear 2013e). ³
<p>Notes: ¹ Previously recorded resource within the Study Area. ² Previously Recorded Resources within 0.5-mile Radius of Study Area. ³ Evaluated in accordance with State CEQA Guidelines section 15064.5, subdivision (a)(2)-(3), using criteria outlined in Public Resources Code section 5024.1.</p>		

Table 3.5-2. Previously Conducted Studies in the Study Area

Author	Date	Title	Results
Anthropological Studies Center (ASC)	1998a	An Archaeological Resources Study for the Solano County Portion of the Chevron Bay Area Pipeline Project, California	Identified BAPL-1, “a shipwreck and other historical remains.” BAPL-1 has not been formally evaluated for significance under CEQA, but is outside of the area of potential impacts for the proposed project.
	1998b	A Supplemental Archaeological Resources Study for the Solano County Portion of the Chevron Bay Area Pipeline Project, California	Negative findings for archaeological resources.
JRP Historical Consulting, LLC (Cited in Brookshear 2013a-e.)	2013	Suisun Marsh Cultural Resources Contextual Report	Identified two built environment resources within the study area and three within a 0.5-mile radius. These resources were evaluated in accordance with State CEQA Guidelines section 15064.5, subdivision (a)(2)-(3), using criteria outlined in Public Resources Code section 5024.1, and did not appear to be a historical resource for the purposes of CEQA.
Meyer et al.	2013	Suisun Marsh Habitat Management, Preservation, and Restoration Plan Cultural Resources Contextual Report. Volume I	A comprehensive assessment of prehistoric and historic-era archaeological resources and a geoarchaeological sensitivity study for the Suisun Marsh Habitat Management, Preservation, and Restoration Plan. Results indicate 95 percent of the study area has a moderate or lower sensitivity for archaeological resources and requires little to further management. Less than 0.5 percent of the study area was determined to have a very high sensitivity. These areas would need to be avoided or tested prior to deep construction activities.

1 On February 11, 2016, an AECOM archaeologist conducted a pedestrian survey of the
2 study area to identify cultural resources. At the time of the survey, only the top of the
3 levee at the North Work Area was accessible; the rest of the pipeline corridor was
4 submerged under water and inaccessible. The survey included the two proposed
5 staging areas adjacent to Honker Bay and along the Roaring River, and the barge
6 offloading area downstream of the Suisun Marsh Salinity Control Structure. These areas
7 have been previously graded, compacted, and graveled. Survey transects were spaced
8 5 meters apart or less. Ground visibility was good, given the flat and open terrain and
9 relatively low-lying and sparse vegetation within the study area. No previously
10 unidentified cultural resources were identified as a result of this field survey.

1 Archaeological surveys of the study area and surrounding marshlands have proved
2 negative for prehistoric archaeological resources. In 1909, N.C. Nelson conducted an
3 archaeological study that examined sites in the San Francisco Bay Area, including the
4 shoreline of the nearby Montezuma Hills area. In his survey of shellmounds in the
5 region, Nelson (1909, as cited in ASC 1998a) recorded several sites in the study area
6 vicinity, but did not identify shellmounds within or adjacent to the study area. ASC
7 (1998a) identified seven prehistoric archaeological sites recorded within a 6-mile radius
8 of the study area, and “all are located between 0- to 20-foot elevation, and, with the
9 exception of two shellmounds...on the south side of Suisun Bay, all are at slope
10 changes and changes in vegetation.” The landscape of the current study area does not
11 correspond to these criteria. Based on the current study and these previous studies, the
12 possibility of unidentified prehistoric archaeological sites is low in the study area.

13 Likewise, the possibility that buried archaeological resources are present in the study
14 area is also low. Of the entire Suisun Marsh studied by Meyer et al. (2013), 95 percent
15 of the study area has a moderate or lower sensitivity for buried archaeological
16 resources, which includes the current study area. The remaining high (or very high)
17 sensitivity areas are found northwest of, and well beyond, the study corridor and in the
18 uplands to the east near Montezuma Hills.

19 **3.5.2 Regulatory Setting**

20 Federal and state laws and regulations pertaining to this issue area and relevant to the
21 Project are identified in Appendix A. There are no local goals, policies, and/or
22 regulations applicable to this issue area for the Project.

23 **3.5.3 Impact Analysis**

24 ***a) Cause a substantial adverse change in the significance of a historical***
25 ***resource as defined in § 15064.5?***

26 ***b) Cause a substantial adverse change in the significance of an archaeological***
27 ***resource pursuant to § 15064.5?***

28 **a) and b) Less than Significant with Mitigation.** Although no historical or unique
29 archaeological resources have been identified within the study area (see Section 3.5.1.,
30 Environmental Setting), there is a moderate possibility of discovering unidentified sites
31 in the study area that may qualify as historical or unique archaeological resources.
32 Although a large portion of the study area has been surveyed and no archaeological
33 resources have been identified within the pipeline corridor, there is always a possibility
34 of encountering previously unknown archaeological resources during Project activities.
35 To ensure that potential impacts to archaeological resources are avoided or mitigated to
36 less than significant, the following MM would be implemented.

1 **MM CUL-1: Discovery of Previously Unknown Cultural Resources.** In the event
2 that potentially significant archaeological or tribal cultural resources are
3 discovered any time during construction, all earth-disturbing work within 100
4 feet of the discovery shall be temporarily suspended or redirected until a
5 professional archaeologist and a culturally affiliated tribal monitor, have
6 evaluated the nature and significance of the discovery. In the event that a
7 potentially significant archaeological or tribal cultural resource is discovered,
8 Chevron Pipe Line Company, the California State Lands Commission (CSLC),
9 and any local, state, or federal agency with approval or permitting authority
10 over the Project that has requested/required such notification shall be notified
11 within 48 hours. Impacts to previously unknown significant archaeological or
12 tribal cultural resources shall be avoided through preservation in place if
13 feasible. Damaging effects to tribal cultural resources shall be avoided or
14 minimized following the measures identified in Public Resources Code section
15 21084.3, subdivision (b), if feasible, unless other measures are mutually
16 agreed to by the lead archaeologist and culturally affiliated tribal monitor that
17 would be as or more effective. A treatment plan developed by the archaeologist
18 and, for tribal cultural resources, the culturally affiliated tribal monitor, shall be
19 submitted to CSLC staff for review and approval. If the lead archaeologist and
20 the culturally affiliated tribal monitor believe that damaging effects to tribal
21 cultural resources will be avoided or minimized, then work in the area may
22 resume.

23 ***c) Cause a substantial adverse change in the significance of a tribal cultural***
24 ***resource as defined in Public Resources Code § 21074?***

25 **Less than Significant with Mitigation.** Assembly Bill (AB) 52 made changes to CEQA
26 regarding tribal cultural resources and consultation with California Native American
27 Tribes who have previously requested to be notified of projects in the geographic area
28 traditionally and culturally affiliated with that tribe. Tribal cultural resources include sites,
29 features, places, cultural landscapes, sacred places, and objects with cultural value to a
30 Tribe that is eligible under the California Register of Historic Resources or local register
31 of historical resources. A tribal cultural resource can also be a resource that a lead
32 agency determines, in its discretion and considering the significance of the resource to
33 a Tribe, to be significant pursuant to criteria set forth in Public Resources Code section
34 5024.1. Under AB 52, lead agencies must avoid damaging effects to tribal cultural
35 resources, when feasible, regardless of whether consultation occurred or is required.

36 To date, CSLC staff has not received written requests for notification from tribes whose
37 geographic area of cultural affiliation overlaps with that of the Project; however, the
38 Native American Heritage Commission (NAHC) provided a contact list of two Tribes that
39 the CSLC should contact to gather information regarding the potential for tribal cultural
40 resources within the Project area. CSLC staff notified these Tribes on June 15, 2016, to
41 proactively engage with those tribes to ensure they have the opportunity to provide
42 meaningful input on the Project's potential effects. If the CSLC is notified of the potential

1 for tribal cultural resources in the Project area, staff will consult with those tribes to
2 ensure that impacts to tribal cultural resources remain less than significant.

3 The NAHC searched its Sacred Lands File for Native American cultural sites and found
4 no occurrences within the Honker Bay U.S. Geological Survey (USGS) quadrangle
5 (NAHC letter to the CSLC dated March 14, 2016). However, as discussed in Section
6 3.5.1, Environmental Setting, there is a moderate possibility of discovering unidentified
7 archaeological sites in the study area, which may include tribal cultural resources.
8 Although the Sacred Lands File search returned negative results for the occurrence of
9 tribal cultural resources and no archaeological resources have been identified within the
10 pipeline corridor, the possibility always exists that previously unknown tribal cultural
11 resources may be encountered during Project activities. To ensure that potential
12 impacts to tribal cultural resources are avoided or mitigated to less than significant, **MM**
13 **CUL-1** would be implemented which would temporarily halt all earth-disturbing work in
14 the event that previously unknown cultural resources are discovered until a professional
15 archaeologist, as determined by the NAHC, has evaluated the nature and significance
16 of the discovery. Therefore, with the implementation of **MM CUL-1**, this impact would be
17 avoided or mitigated to less than significant.

18 ***d) Directly or indirectly destroy a unique paleontological resource or site or***
19 ***unique geologic feature?***

20 **Less than Significant with Mitigation.** Paleontological resources are the fossilized
21 evidence of past life found in the geologic record. Despite the prodigious volume of
22 sedimentary rock deposits preserved worldwide and enormous number of organisms
23 that have lived through time, preservation of plant or animal remains as fossils is an
24 extremely rare occurrence. Because of the infrequency of fossil preservation, fossils
25 (particularly vertebrate fossils) are considered to be nonrenewable resources. Because
26 of their rarity, and the scientific information they can provide, fossils are highly
27 significant records of ancient life. Paleontological resource localities are those sites
28 where the fossilized remains of extinct animals and/or plants have been preserved.
29 Rock formations that are considered of paleontological sensitivity are those rock units
30 that have yielded significant vertebrate or invertebrate fossil remains, including, but not
31 limited to, sedimentary rock units that contain significant paleontological resources
32 anywhere within its geographic extent. The Project area is underlain by mud and clay
33 deposits of the Holocene (USGS and Association for American State Geologists 2016).

34 Although no paleontological resources were identified within the Project area or its
35 immediate surroundings, ground-disturbing activities could adversely affect any
36 unidentified deposits. Such deposits are unlikely given the limited depth of construction
37 and because only minor or shallow excavation may be involved in construction.
38 However, to ensure that potential impacts to paleontological resources are avoided or
39 mitigated to less than significant, the following MM would be implemented.

1 **MM CUL-2: Discovery of Previously Unknown Paleontological Resources.** In
2 the event that potentially significant paleontological resources are discovered
3 during Project construction: (1) Chevron Pipe Line Company (CPL) shall
4 immediately redirect or temporarily suspend all earth-disturbing work within 100
5 feet of the discovery until a professional paleontologist, approved by California
6 State Lands Commission (CSLC) staff, has evaluated the nature and
7 significance of the discovery; and (2) CPL shall immediately notify (within 48
8 hours) CSLC staff and any local, state, or federal agency with approval or
9 permitting authority over the Project that has requested/required such
10 notification. A treatment plan developed by the paleontologist shall be
11 submitted to CSLC staff for review and approval. If the lead paleontologist
12 believes that damaging effects to paleontological resources will be avoided or
13 minimized, then work in the area may resume.

14 ***e) Disturb any human remains, including those interred outside of formal***
15 ***cemeteries?***

16 **Less than Significant with Mitigation.** Archival research conducted at the NWIC
17 indicated that built environment resources are located in the study area and within a
18 0.5-mile radius. The research also indicated that the study area does not contain any
19 previously recorded Native American sites or historic-period archaeological sites. The
20 Project is not expected to impact human burials, however, in the unanticipated event
21 that burials are encountered, they must be managed in accordance with state law. To
22 ensure that potential impacts to human remains are avoided or mitigated to less than
23 significant, the following MM would be implemented.

24 **MM CUL-3: Unanticipated Discovery of Human Remains.** If human remains are
25 unearthed, State Health and Safety Code section 7050.5 requires that no
26 further disturbance shall occur until the County Coroner has made the
27 necessary findings as to origin and disposition pursuant to Public Resources
28 Code section 5097.98. If the remains are determined to be of Native American
29 descent, the coroner has 24 hours to notify the Native American Heritage
30 Commission. Chevron Pipe Line Company and California State Lands
31 Commission staff shall be notified immediately within 24 hours of the discovery.

32 **3.5.4 Mitigation Summary**

33 Implementation of the following MMs would reduce the potential for Project-related
34 impacts to Cultural and Paleontological Resources to less than significant:

- 35 • MM CUL-1: Discovery Previously Unknown Cultural Resources
- 36 • MM CUL-2: Discovery of Previously Unknown Paleontological Resources
- 37 • MM CUL-3: Unanticipated Discovery of Human Remains

1 **3.6 GEOLOGY AND SOILS**

GEOLOGY AND SOILS – Would the Project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Expose people or structures to 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.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

2 **3.6.1 Environmental Setting**

3 3.6.1.1 Geology and Seismicity

4 The Project area is located within the Great Valley geomorphic province and adjacent to
 5 the Coast Range geomorphic province (California Geological Survey [CGS] 2002). The
 6 Great Valley geomorphic province is a large alluvial plain in which sediments have been
 7 deposited almost continuously since the Jurassic period (around 160 million years ago).
 8 The Project area is dominated by Holocene Alluvium. The Great Valley contains four
 9 Alquist-Priolo faults, none of which is in the Project area (CGS 1993). The nearest
 10 known fault is the Green Valley/Concord fault, approximately 10 miles west. The
 11 adjacent Coast Range geomorphic province is characterized by moderate to high
 12 seismicity principally associated with the San Andreas Fault and other sub-parallel

1 faults that constitute the boundary between the North American and Pacific tectonic
2 plates. Since the Project area is in an active geologic area, it could be subject to intense
3 levels of earthquake-related ground shaking.

4 3.6.1.2 Soils

5 Soils in the Project area are mostly relatively soft and loose alluvial deposits of
6 interbedded sand, clay, and silt, including Young Bay Mud/Peat, Loose Bay Sands,
7 Dense Bay Sand, Stiff Clay, and Old Bay Clay (AECOM 2015). The area is subject to
8 frequent ponding, saturation, and flooding, and parts of the Project area are subject to
9 very severe erosion of disturbed soils (Solano County 2008b [Exhibits 4.7-5 and 4.7-6]).

10 3.6.1.3 Groundwater

11 The Project area is within the San Francisco Bay Drainage Province (Solano County
12 2008b [Exhibit 4.5-2]), and within the Suisun-Fairfield Valley (2-3) Groundwater Basin,
13 which drains to Suisun Bay (DWR 2014). The Groundwater Basin is comprised of late
14 Tertiary to Quaternary age volcanic rocks and continental sedimentary deposits. The
15 water-bearing units within the basin include the Sonoma Volcanics, Pleistocene
16 Alluvium, and Recent Alluvium. The Pleistocene Alluvium constitutes the primary
17 aquifer. Groundwater levels during recent soil investigations were approximately 4 to 5
18 feet below ground surface (AECOM 2015); however, groundwater levels are likely to
19 fluctuate with seasonal and tidal influences.

20 3.6.1.4 Topography

21 The topography of the Project area is dominated by the Suisun Marsh, which is
22 generally flat except where levees create small, localized slopes. In general, the area
23 gently slopes southwards towards Honker Bay.

24 **3.6.2 Regulatory Setting**

25 Federal and state laws and regulations pertaining to geology and soils and relevant to
26 the Project are identified in Appendix A. At the local level, the Solano County General
27 Plan includes the following geology- and soils-related goals and policies of relevance to
28 this Project (Solano County 2015):

- 29 • HS.G-1: Minimize the potential for loss of life and property resulting from natural
30 or human-caused hazards.
- 31 • HS.P-12: Require new development proposals in moderate or high seismic
32 hazard areas to consider risks caused by seismic activity and to include Project
33 features that minimize these risks.

- 1 • HS.P-13: Review and limit the location and intensity of development and
2 placement of infrastructure in identified earthquake fault zones.
- 3 • HS.P-14: Identify and minimize potential hazards to life and property caused by
4 fault displacement and its impact on facilities that attract large numbers of
5 people, are open to the general public, or provide essential community services
6 and that are located within identified earthquake fault zones.
- 7 • HS.P-15: Reduce risk of failure and reduce potential effects of failure during
8 seismic events through standards for the construction and placement of utilities,
9 pipelines, or other public facilities located on or crossing active fault zones.
- 10 • HS.P-16: Require minimum setbacks for construction along creeks between the
11 creek bank and structure, except for farm structures that are not dwellings or
12 places of work, based on the susceptibility of the bank to lurching caused by
13 seismic shaking.
- 14 • HS.P-17: Restrict the crossing of ground failure areas by new public and private
15 transmission facilities, including power and water distribution lines, sewer lines,
16 and gas and oil transmission lines.
- 17 • HS.P-18: Make information about soils with a high shrink-swell potential readily
18 available. Require proper foundation designs in these areas.
- 19 • HS.P-19: Minimize development in areas with high landslide susceptibility.

20 **3.6.3 Impact Analysis**

21 ***a) Expose people or structures to potential substantial adverse effects, including***
22 ***the risk of loss, injury, or death involving:***

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

26 **No Impact.** No Alquist-Priolo faults are in the Project area (CGS 1993). The nearest
27 known fault is 10 miles west of the Project area; therefore, there would be no impact
28 from the rupture of known earthquake faults.

29 ***ii) Strong seismic ground shaking?***

30 **Less than Significant Impact.** The Project area would experience ground shaking from
31 earthquakes generated along active faults located offsite. The intensity of ground
32 shaking would depend upon the magnitude of the earthquake, distance to the epicenter,
33 and the geology of the area between the epicenter and the Project area. Project
34 infrastructure and workers could be subjected to seismic ground shaking if a significant
35 earthquake occurred in the area during Project implementation. However, construction

1 and pipeline replacement activities would not create adverse effects to people or
2 structures related to ground shaking.

3 The Project would be designed to resist seismic forces, and would replace an existing
4 aged segment of the BAPL pipeline with a new pipe segment, thereby reducing the
5 overall vulnerability of the system to seismic hazards, including strong ground shaking.
6 Adherence to standard engineering practices and design criteria relative to seismic and
7 geologic hazards in accordance with the Uniform Building Code would reduce the
8 significance of potential impacts to less than significant.

9 ***iii) Seismic-related ground failure, including liquefaction?***

10 **Less than Significant Impact.** Soil liquefaction is a phenomenon whereby rapid cyclic
11 loading, typically by an earthquake, increases the pore water pressures to the point
12 where the shear strength of the soil is reduced momentarily, causing failures,
13 settlements, and displacements. Liquefaction risk is greatest where soils are loose,
14 saturated, and consist of medium- to fine-grained sands and coarse silts. The
15 combination of loose soil located below groundwater and strong ground shaking
16 conditions may occur along portions of the Project alignment. The USGS Liquefaction
17 Susceptibility map indicates that the Project area has a moderate susceptibility for
18 liquefaction (USGS 2006); however, the Solano County General Plan indicates the
19 Project area is within a zone of high liquefaction potential (Solano County 2015a). The
20 Project would replace an existing aged segment of the BAPL pipeline with a new pipe
21 segment, thereby reducing the overall vulnerability of the system to seismic hazards,
22 including liquefaction. Therefore, the impact of seismic-related ground failure, including
23 liquefaction, would be less than significant.

24 ***iv) Landslides?***

25 **No Impact.** The Project area and vicinity are generally flat, and therefore does not have
26 the potential to slide or experience sliding from adjacent areas. While there are minor
27 slopes associated with the levees, these are not expected to be at risk. Therefore, there
28 would be no impact from landslides.

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

30 **Less than Significant Impact.** Project construction, including the creation of the work
31 pad at the North Work Area, would not require any vegetation clearing or grading. The
32 filter fabric, base rock, and all-weather mats would be placed on top of the ungraded
33 ground surface to create the work pad. Improvements to levee road surfaces would
34 consist of placement of baserock on the existing gravel and dirt road surfaces, which
35 would reduce the potential for substantial erosion of the road surfaces. Therefore, the
36 impact of soil erosion or the loss of topsoil would be less than significant.

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

4 **Less than Significant Impact.** The Project area contains relatively soft and loose
5 alluvial deposits of interbedded sand, clay, and silt to depths ranging from
6 approximately 40 to 95 feet below ground surface. Due to the alluvial environment of the
7 marsh, the nature of these soil deposits are highly variable. However, underlying these
8 deposits are materials generally described as being much stiffer and denser than the
9 overlying material (AECOM 2015). The proposed HDD drilling and new pipeline would
10 be installed within this denser, deeper stratum.

11 Soils at the North Work Area are saturated and may be unstable and potentially subject
12 to liquefaction, but would be stabilized by the construction of a work surface using rock
13 fill material and interlocking geotextile mats. Project-induced landslides, lateral
14 spreading, or subsidence are not anticipated due to the flat topography and because no
15 groundwater pumping would occur. Excavating the North Work Area entry pit to expose
16 the existing pipeline could create an unstable soil condition; however, as required by the
17 Occupational Safety and Health Administration, engineered shoring and trench boxes
18 would be installed to prevent soil collapse. Additionally, 1.5-inch drain rock would be
19 placed in the bottom of the trench for workers to have a dry firm area to work, and, if
20 needed, dewatering of the trench would be undertaken. For these reasons, potential
21 impacts related to unstable soils or Project-induced landslides, lateral spreading,
22 subsidence, liquefaction, or collapse would be considered less than significant.

23 ***d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform***
24 ***Building Code (1994), creating substantial risks to life or property?***

25 **No Impact.** Soils in the Project area are mostly relatively soft and loose alluvial deposits
26 of interbedded sand, clay, and silt. Expansive soils may be encountered; however,
27 construction and replacement of the new BAPL pipe segment would not increase the
28 risk to life or property created by their presence. Therefore, there would be no impact.

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

32 **No Impact.** The Project would not use septic tanks or alternative waste water disposal
33 systems; therefore, there would be no impact.

34 **3.6.4 Mitigation Summary**

35 The Project would not result in significant impacts to Geology and Soils; therefore, no
36 mitigation is required.

1 **3.7 GREENHOUSE GAS (GHG) EMISSIONS**

GREENHOUSE GAS EMISSIONS –Would the Project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

2 **3.7.1 Environmental Setting**

3 GHGs are defined as any gas that absorbs infrared radiation in the atmosphere. GHGs
 4 include, but are not limited to, water vapor, carbon dioxide (CO₂), methane (CH₄),
 5 nitrous oxide (N₂O), and fluorocarbons. These GHGs lead to the trapping and buildup of
 6 heat in the atmosphere near the Earth’s surface, commonly known as the Greenhouse
 7 Effect. The atmosphere and the oceans are reaching their capacity to absorb CO₂ and
 8 other GHGs without significantly changing the Earth’s climate. Unlike criteria pollutants
 9 and TACs, which are pollutants of regional and local concern, GHGs and climate
 10 change are local, regional, and global issues.

11 As stated on California’s Climate Change Portal (www.climatechange.ca.gov):

12 *Climate change is expected to have significant, widespread impacts on California's*
 13 *economy and environment. California's unique and valuable natural treasures -*
 14 *hundreds of miles of coastline, high value forestry and agriculture, snow-melt fed*
 15 *fresh water supply, vast snow and water fueled recreational opportunities, as well as*
 16 *other natural wonders - are especially at risk.*

17 In addition, the Intergovernmental Panel on Climate Change (IPCC), in the section of its
 18 Fifth Assessment Report by Working Group II, Climate Change 2014: Impacts,
 19 Adaptation, and Vulnerability (Romero-Lankao et al. 2014) specific to North America
 20 (Chapter 26), stated in part:

21 *North American ecosystems are under increasing stress from rising temperatures,*
 22 *CO₂ concentrations, and sea-levels, and are particularly vulnerable to climate*
 23 *extremes (very high confidence). Climate stresses occur alongside other*
 24 *anthropogenic influences on ecosystems, including land-use changes, non-native*
 25 *species, and pollution, and in many cases would exacerbate these pressures (very*
 26 *high confidence). [26.4.1; 26.4.3]. Evidence since the Fourth Assessment Report*
 27 *(AR4) highlights increased ecosystem vulnerability to multiple and interacting climate*
 28 *stresses in forest ecosystems, through wildfire activity, regional drought, high*
 29 *temperatures, and infestations (medium confidence) [26.4.2.1; Box 26-2]; and in*

1 *coastal zones due to increasing temperatures, ocean acidification, coral reef*
2 *bleaching, increased sediment load in run-off, sea level rise, storms, and storm*
3 *surges (high confidence) [26.4.3.1].*

4 Climate change is having widespread impacts on California's economy and
5 environment, and will continue to affect communities across the State in the future.
6 Many impacts, including increased fires, floods, severe storms, and heat waves are
7 occurring already (California Climate Change Center 2012). Documented effects of
8 climate change in California include increased average, maximum, and minimum
9 temperatures; decreased spring run-off to the Sacramento River; shrinking glaciers in
10 the Sierra Nevada; a rise in sea level at the Golden Gate Bridge; warmer temperatures
11 in Lake Tahoe, Mono Lake, and other major lakes; and changes in elevations for plant
12 and animal species (Office of Environmental Health Hazard Assessment 2013).

13 According to the IPCC, the concentration of CO₂, the primary GHG, has increased from
14 approximately 280 parts per million (ppm) in pre-industrial times to well over 380 ppm.
15 The current rate of increase in CO₂ concentrations is about 1.9 ppm/year; present CO₂
16 concentrations are higher than any time in at least the last 650,000 years. To meet the
17 statewide GHG reduction target for 2020, requiring California to reduce total statewide
18 GHG emissions to 1990 levels (Health & Saf. Code, § 38550), and the 2050 goal of 80
19 percent below 1990 levels (Executive Order S-3-05), projects must contribute to slowing
20 the increase in GHG emissions and, ultimately, contribute to reducing California's output
21 of GHGs. To reach these GHG reduction targets, per capita emissions would need to be
22 reduced by slightly less than 5 percent per year during the 2020 to 2030 period, with
23 continued reductions required through mid-century.

24 CO₂ is the most common reference gas for climate change. To account for the warming
25 potential of different GHGs, emissions are often quantified and reported as CO₂
26 equivalents (CO₂e). With the warming potential of CO₂ set at a reference value of 1,
27 CH₄ has a warming potential of 25 (i.e., 1 ton of methane has the same warming
28 potential as 25 tons of CO₂ [IPCC 2007]), while N₂O has a warming potential of 298.
29 There is widespread international scientific consensus that human-caused increases in
30 GHGs have and will continue to contribute to climate change, although there is
31 uncertainty concerning the magnitude and rate of the warming.

32 **3.7.2 Regulatory Setting**

33 Federal and state laws and regulations pertaining to GHG emissions and relevant to
34 the Project are identified in Appendix A. Various entities address this issue area at the
35 state and regional levels. For example, CARB's Climate Change Scoping Plan (2008)
36 establishes GHG reduction strategies and goals for California's future, focusing on large
37 contributors to State GHG emissions (e.g., power generation and transportation). At the
38 local level, Solano County (2011) adopted a Climate Action Plan in June 2011. The Plan

1 includes GHG inventories and projections for the County, and recommended reduction
2 measures for the five strategy sectors of agriculture, transportation and land use,
3 energy use and efficiency, water use and efficiency, and waste reduction and recycling.
4 At the regional level, the Metropolitan Transportation Commission (MTC) and
5 Association of Bay Area Governments (ABAG) developed Plan Bay Area, a regional
6 transportation plan for the nine-county Bay Area. The Plan includes the San Francisco
7 Bay Area Sustainable Communities Strategy in accordance with California Senate Bill
8 (SB) 375 and the 2040 Regional Transportation Plan, and includes policies that focus
9 on using the existing transportation network more efficiently (ABAG and MTC 2013).

10 **3.7.3 Impact Analysis**

11 Quantifying project GHG emissions is complex and relies on numerous assumptions.
12 GHG emissions are generally classified as direct (associated with production of GHG
13 emissions from the immediate Project area, including combustion of fuel in engines and
14 construction vehicles used on-site) and indirect (including emissions from vehicles that
15 deliver materials and equipment to the site). With the exception of very large projects,
16 GHGs from individual projects are typically less than significant at the project scale;
17 however, GHG emissions can have a substantial cumulative impact. The revisions to
18 the State CEQA Guidelines adopted on December 30, 2009 (§ 15064, subd. (h)(3)),
19 encourages lead agencies to quantify GHG emissions where possible and provides the
20 basis to assess cumulative impacts of GHG emissions. Section 15064 indicates that:

21 *...a lead agency may determine that a project's incremental contribution to a*
22 *cumulative effect is not cumulatively considerable if the project will comply with the*
23 *requirements in a previously approved plan or mitigation program (including, but not*
24 *limited to, water quality control plan, air quality attainment or maintenance plan,*
25 *integrated waste management plan, habitat conservation plan, natural community*
26 *conservation plan, plans or regulations for the reduction of greenhouse gas*
27 *emissions) that provides specific requirements that will avoid or substantially lessen*
28 *the cumulative problem within the geographic area in which the project is located.*

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

31 **Less than Significant Impact.** The BAAQMD has adopted 1,100 metric tons of
32 CO₂e/year (MTCO₂e/year) as a GHG operational emissions significance criterion for
33 development projects, but has not adopted thresholds for evaluating GHG emissions
34 from construction activities. Construction activities are short term, and direct comparison
35 of construction GHG emissions with long-term thresholds would not be appropriate
36 because these emissions cease upon completion of construction. Other districts (e.g.,
37 South Coast Air Quality Management District 2008; San Luis Obispo County Air
38 Pollution Control District 2012) recommend that GHG emissions from construction
39 activities (and other short-term sources) be evaluated as part of the total project GHG

1 emissions by amortizing total emissions during construction over a project’s operational
 2 lifetime for comparison with long-term GHG emissions significance thresholds.

3 For this analysis, the amortization method was applied over the Project’s projected
 4 operational lifetime (30 years). Total construction GHG emissions were calculated using
 5 methods and assumptions described in Section 3.3, Air Quality (see Appendix B for
 6 detailed calculations), amortized over 30 years, and compared to the BAAQMD
 7 operational threshold. Table 3.7-1 lists GHG emissions for each construction source.
 8 The Project would generate a total of 713.4 MTCO₂e over the entire construction period.
 9 Amortized over the Project’s anticipated 30-year operational lifetime, construction would
 10 result in amortized annual emissions of 23.8 MTCO₂e per year. Amortized annual
 11 construction emissions would not exceed the threshold of significance; therefore, GHG
 12 emissions would be less than significant.

Table 3.7-1. Project Construction Greenhouse Gas Emissions

Work Component	CO ₂ e Emissions (metric tons)
Horizontal Directional Drilling	232.4
Pipeline Replacement	233.4
Construction Office (includes operation of vehicles and off-road equipment)	66.5
Marine Construction Equipment (includes operation of marine vessels)	181.2
Total Construction Emissions (metric tons)¹	713.4
GHGs Amortized Over 30 years (metric tons/year)	23.8
BAAQMD Project Threshold of Significance (metric tons/year)	1,100
Exceeds Threshold?	No
Notes: ¹ Totals in table may not exactly add up due to rounding.	

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

15 **No Impact.** As described under Checklist Item **a)** above, Project construction emissions
 16 would not exceed BAAQMD thresholds of significance. GHGs from construction
 17 activities emitted either directly or indirectly would not have a significant impact on the
 18 environment or substantially contribute to global GHG emissions. Therefore, the Project
 19 would not conflict with applicable plans, policies, or regulations adopted for the
 20 purposes of reducing GHG emissions. Further, as operational emissions of the BAPL
 21 pipeline would not change following Project completion, the Project would not conflict
 22 with established GHG reduction targets.

23 **3.7.4 Mitigation Summary**

24 The Project would not generate significant GHG emissions; therefore, no mitigation is
 25 required.

1 **3.8 HAZARDS AND HAZARDOUS MATERIALS**

HAZARDS AND HAZARDOUS MATERIALS – Would the Project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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 for people residing or working in the Project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the Project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

2 **3.8.1 Environmental Setting**

3 The Project site is located within Suisun Marsh, north of Honker Bay, in Solano County
 4 and extends into Honker Bay approximately 7,000 feet from the shore (Figure 1-1).
 5 Uses of the marsh consist of preserving wildlife habitat and recreation, including hunting
 6 and fishing. There are no permanent residences or industrial activities within the Project
 7 area. Searches of the State Water Resources Control Board (SWRCB) GeoTracker and
 8 Department of Toxic Substances Control (DTSC) Envirostor databases showed no

1 potentially contaminated sites within the Project area (SWRCB 2016; DTSC 2016). The
2 nearest sites are a former military radar station located more than 3 miles north of the
3 North Work Area and a former leaking underground storage tank located at CDFW
4 facility on Grizzly Island Road approximately 5 miles north of the North Work Area.

5 **3.8.2 Regulatory Setting**

6 Federal and state laws and regulations pertaining to hazards and hazardous materials
7 and relevant to the Project are identified in Appendix A. At the local level, the Solano
8 County General Plan contains the following hazardous materials-related policy relevant
9 to Project activities (Solano County 2015a):

- 10 • HS.P-26: Minimize the risks associated with transporting, storing, and using
11 hazardous materials through methods that include careful land use planning and
12 coordination with appropriate Federal, State, or County agencies.

13 **3.8.3 Impact Analysis**

14 ***a) Create a significant hazard to the public or the environment through the***
15 ***routine transport, use, or disposal of hazardous materials?***

16 ***b) Create a significant hazard to the public or the environment through***
17 ***reasonably foreseeable upset and accident conditions involving the release of***
18 ***hazardous materials into the environment?***

19 **a) and b) Less than Significant with Mitigation.** The Project would involve the routine
20 transport, storage, use, and disposal of small quantities of hazardous materials during
21 construction. Products used during construction such as gasoline, diesel, lubricants
22 (e.g., bentonite clay drilling slurry for HDD), and solvents are categorized as hazardous
23 materials, and are highly regulated by federal, state, and local laws and regulations.
24 Significant impacts to the surrounding environment(s) could occur if routine operations
25 or unanticipated accidents release such materials into the environment.

26 Several MMs would be implemented, as outlined below, to ensure that potential impacts
27 from hazardous material releases are avoided or mitigated to less than significant. For
28 example, **MM HAZ-1** would require preparation of an Oil Spill Response Plan (OSRP).
29 To ensure that no residual product in the BAPL is accidentally released into the
30 environment when the pipeline is cut to make the tie-in, the pipeline would be pigged⁷
31 and flushed to clean it of residual petroleum products in accordance with **MM HAZ-2**.
32 Because drill muds could be released during drilling in the event of an inadvertent return
33 (a condition where drill mud is released through fractured bedrock into the surrounding

⁷ Pigging involves pushing a device known as a “pig” through the pipe using nitrogen. The pig has a diameter similar to the inner diameter of the pipe and cleans the pipe of all petroleum products as it passes through.

1 rock and sand and travels to the surface), an Inadvertent Return Contingency Plan for
2 HDD would be prepared that includes contingencies for terrestrial and aquatic
3 inadvertent return conditions (see **MM HAZ-3**); a draft of this plan has been developed
4 and is included as Appendix D. Engineering design methods such as the 20-inch casing
5 proposed at the South Work Area would also minimize disturbance on the bay bottom,
6 would reduce turbidity during the drilling by isolating the drilling operation from the
7 surrounding water, and would ensure that drill muds are captured and recirculated.

8 **MM HAZ-1: Oil Spill Response Plan (OSRP).** Chevron Pipe Line Company shall
9 submit a Project-specific OSRP to California State Lands Commission staff 30
10 days prior to start of Project activities for review and approval. At a minimum,
11 the Project-specific OSRP shall:

- 12 • Clearly identify the responsibilities of onshore and offshore contractors
13 prior to and during an unanticipated release of oil or other hydrocarbon;
- 14 • List and identify the location(s) of oil spill response equipment (including
15 booms) onshore and offshore onboard Project vessels;
- 16 • List response times for deployment;
- 17 • Require that petroleum-fueled equipment on the main deck of all vessels
18 have drip pans or other means of collecting dripped petroleum, which
19 shall be collected and treated with onboard equipment;
- 20 • Require the primary work vessel to carry on board a minimum 400 feet
21 of sorbent boom, five bales of sorbent pads at least 18-inch by 18-inch
22 square, and small powered boat for rapid deployment to contain and
23 clean up any small spill or sheen on the water surface;
- 24 • Ensure that contracts with off-site spill response companies are in place
25 prior to start of Project activities; and
- 26 • Provide for additional containment and clean-up resources as needed.

27 **MM HAZ-2: Pipeline Cleaning and Containment.** Prior to cutting and tie-in
28 activities, the existing pipeline shall be pigged and flushed to remove residual
29 petroleum products. This work would begin at a valve location in Pittsburg and
30 continue to another valve location near Highway 113 or at Birds Landing. The
31 water and cleaning agent used to flush the pipe shall be recovered at the valve
32 location near Highway 113 or at Birds Landings and disposed of at an
33 appropriate facility. Although the line will be cleaned prior to cutting for the tie-
34 in, secondary containment shall be set up at the North and South Work Areas
35 as a precaution to prevent the accidental release of any material that may still
36 remain inside the pipeline.

37 **MM HAZ-3: Inadvertent Return Contingency Plan.** At least 30 days before Project
38 implementation, Chevron Pipe Line Company shall submit to California State
39 Lands Commission staff for review and approval, and shall subsequently
40 implement in the event of an inadvertent return, a Final Inadvertent Return
41 Contingency Plan for Horizontal Directional Drilling. The Inadvertent Return

1 Contingency Plan shall ensure that preventive and responsive measures can
2 be implemented by the contractor and shall include:

- 3 • Design protocols to be implemented for the protection of sensitive
4 cultural and biological resources; and
- 5 • Design protocols to require a geotechnical engineer or qualified
6 geologist to make recommendations regarding the suitability of the
7 formations to be bored to minimize the potential for inadvertent return
8 conditions.

9 The existing pipe segment may also contain an asbestos coating that would need to be
10 removed to complete the tie-in. Typically, if present, 3 to 10 feet of the coating would
11 need to be removed at the North and South ends of the pipeline. To ensure safety,
12 avoid contamination of the environment with asbestos, and ensure proper disposal of
13 any asbestos coating removed from the pipe, the following MM would be implemented.

14 **MM HAZ-4: Asbestos Handling Procedures.** Construction personnel shall be
15 informed of the potential presence of asbestos-containing material (ACM) at
16 the construction site prior to their assignment. After exposing the existing
17 pipeline and prior to start of cutting and tie-in activities, a certified asbestos
18 inspector/consultant shall test whether the coating consists of ACM greater
19 than 1 percent by weight. If testing reveals the coating contains ACM less than
20 1 percent by weight, the pipe segment shall be treated as normal construction
21 waste and no additional measures are required. If testing reveals the coating
22 contains ACM greater than 1 percent by weight, the materials shall be abated
23 by a certified asbestos abatement contractor in accordance with the regulations
24 and notification requirements of the Bay Area Air Quality Management District,
25 and in accordance with applicable worker safety regulations. All ACM removed
26 from the pipe segment shall be labeled, transported, and disposed of at a
27 verified and approved ACM disposal facility.

28 ***c) Emit hazardous emissions or handle hazardous or acutely hazardous***
29 ***materials, substances, or waste within 0.25 mile of an existing or proposed***
30 ***school?***

31 **No Impact.** The Project is within the undeveloped Suisun Marsh, and there are no
32 existing or proposed schools within 0.25 mile of the Project area. The nearest school is
33 Shore Acres Elementary School, which is four miles from the South Work Area in Bay
34 Point. Therefore, there would be no impact to schools.

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

38 **No Impact.** The Hazardous Waste and Substances Sites (Cortese) List is a planning
39 document used by the State, local agencies, and developers to comply with CEQA

1 requirements in providing information about the location of hazardous materials release
2 sites. Government Code section 65962.5 requires the California Environmental
3 Protection Agency to develop an updated Cortese List at least annually.

4 As described in Section 3.8.1, Environmental Setting, searches of the SWRCB's
5 GeoTracker and the DTSC's Envirostor databases (searched on March 1, 2016)
6 showed no potentially contaminated sites within the Project area. Within the Suisun
7 Marsh, the nearest site is a former military radar station (a former Very High Frequency
8 4K4 Military Reservation) located more than 3 miles north of the North Work Area. This
9 site, which is currently under assessment, was used by the Department of Defense from
10 1942 to 1948 and contained an underground storage tank, gun emplacement, pole-
11 mounted transformer, and a cistern. Additionally, approximately 5 miles northwest of the
12 North Work Area, there is a former leaking underground storage tank located at CDFW
13 facility on Grizzly Island Road. This CDFW property was closed in 1987. Other sites
14 were noted in the databases across Honker Bay 3 miles or more from the South Work
15 Area; however, there is no potential pathway for contamination from sites across
16 Honker Bay to affect the Project area. Therefore, there would be no impact.

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

21 ***f) For a project within the vicinity of a private airstrip, result in a safety hazard***
22 ***for people residing or working in the Project area?***

23 **e) and f) No Impact.** The Project is not located within an airport land use plan. The
24 nearest airports or airfields are Travis Air Force Base to the north (12 miles), the Rio
25 Vista Municipal Airport to the east (12 miles), and the Buchanan Field Airport to the
26 southeast (10 miles). There are no private airstrips located in proximity to the Project
27 area. Therefore, there would be no impact.

28 ***g) Impair implementation of or physically interfere with an adopted emergency***
29 ***response plan or emergency evacuation plan?***

30 **No Impact.** The Project area is in a remote portion of Suisun Marsh, well off public
31 roadways. No public roadways that would be used as emergency response or
32 evacuation routes would be closed as a result of the Project; thus the Project would not
33 interfere with emergency response or evacuation plans. Therefore, there would be no
34 impact.

35 ***h) Expose people or structures to a significant risk of loss, injury or death***
36 ***involving wildland fires, including where wildlands are adjacent to urbanized***
37 ***areas or where residences are intermixed with wildlands?***

1 **Less than Significant Impact.** Grizzly Island is a wildlands area potentially subject to
2 wildland fires in dry areas. The Project component most at risk to wildland fires would
3 be the North Work Area. The marshland surrounding the North Work Area is periodically
4 inundated and the vegetation tends remain green during the spring, posing a lower fire
5 risk than dry grassland. The work area is a 200-foot by 300-foot pad constructed of
6 base rock material, providing a buffer between the workers and equipment and
7 surrounding vegetation. The Suisun Marsh in the Project area is flat and open, providing
8 visibility over long distances allowing workers identify a potential approaching fire. In
9 addition, there are various locations along the Grizzly Island roads that are wide enough
10 to be used as safe-zones in case of a wildland fire. For these reasons, the risk of loss,
11 injury, or death involving wildland fires would be less than significant.

12 **3.8.4 Mitigation Summary**

13 Implementation of the following MMs would reduce the potential for Project-related
14 impacts related to the potential release of Hazardous Materials to less than significant:

- 15 • MM HAZ-1: Oil Spill Response Plan
- 16 • MM HAZ-2: Pipeline Cleaning and Containment
- 17 • MM HAZ-3: Inadvertent Return Contingency Plan
- 18 • MM HAZ-4: Asbestos Handling Procedures

1 3.9 HYDROLOGY AND WATER QUALITY

HYDROLOGY AND WATER QUALITY – Would the Project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on or off site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
j) Expose people or structures to a significant risk of loss. Injury or death involving inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1 **3.9.1 Environmental Setting**

2 The Project is located within Suisun Marsh, north of Honker Bay, in Solano County and
3 extends into Honker Bay approximately 7,000 feet from the shore (Figure 1-1). Suisun
4 Marsh is part of the San Francisco Estuary and is the largest contiguous brackish marsh
5 on the West Coast. Honker Bay is located in the eastern portion of Suisun Bay,
6 approximately 5 miles west of the confluence of the Sacramento and San Joaquin
7 Rivers. Fresh water from the rivers and numerous smaller tributaries flows out through
8 the Sacramento and San Joaquin Rivers, Suisun Bay, San Pablo Bay, the San
9 Francisco Estuary and ultimately to the Pacific Ocean.

10 Freshwater inflows, tidal flows, and their interactions largely determine variations in the
11 hydrology of the San Francisco Estuary, including Suisun Marsh and Honker Bay. The
12 normal tidal range within Suisun Marsh is approximately 5 feet. Tidal velocities in
13 Suisun Marsh channels and sloughs, which depend on the size of the channel cross
14 section and the upstream tidal volume (upstream area), are generally moderate, with
15 maximum velocities of between 1 and 2 feet per second (U.S. Bureau of Reclamation
16 [USBR] et al. 2011).

17 Most tidal channels in Suisun Marsh are bordered by levees that protect managed
18 wetlands. These levees are often a mix of dredged sediment and artificial materials
19 such as riprap and often have fringing vegetation. Montezuma Slough is the major tidal
20 channel within Suisun Marsh, and is located east of the Project. Other channels in the
21 vicinity of the Project include Roaring River Slough and Grizzly Slough.

22 To meet the salinity requirements stipulated by the SWRCB to support "beneficial uses"
23 in Decision-1485, DWR (for the California State Water Project) and USBR (for the
24 Federal Central Valley Project) have constructed several facilities in Suisun Marsh to
25 provide lower salinity water to managed wetlands. The Roaring River Distribution
26 System facility is located near the eastern end of Montezuma Slough and provides
27 seasonal water management needs to approximately 5,000 acres of managed wetlands
28 on Simmons, Hammond, Van Sickle, Wheeler, and Grizzly Islands by providing lower
29 salinity water from Montezuma Slough. It is designed to tidally pump water from
30 Montezuma Slough through a bank of eight 60-inch culverts equipped with fish screens
31 that are maintained and operated by DWR.

32 The Montezuma Slough Salinity Control Gates, which began operating in 1989, span
33 Montezuma Slough near the Roaring River intake and are periodically operated from
34 October to May to meet the more recently established salinity standards set by
35 Decision-1641 to block the salty flood tide from Grizzly Bay, but allow passage of the
36 freshwater ebb tide from the mouth of the Sacramento-San Joaquin Delta.

1 **3.9.2 Regulatory Setting**

2 Federal and state laws and regulations pertaining to hydrology and water quality and
3 relevant to the Project are identified in Appendix A. The Project area is within the
4 jurisdiction of the SFBRWQCB, which implements the Water Quality Control Plan for the
5 San Francisco Bay Basin (Basin Plan) (SFBRWQCB 2015). The Basin Plan designates
6 beneficial uses for specific surface water and groundwater resources, establishes water
7 quality objectives to protect those uses, and sets forth policies to guide the
8 implementation of programs to attain the objectives. Beneficial uses for Honker Bay
9 include commercial fishing, estuarine habitat, fish migration, preservation of rare and
10 endangered species, recreational water uses (contact and non-contact), and wildlife
11 habitat uses. Beneficial uses for Montezuma Slough are the same as for Honker Bay
12 with the addition of fish spawning, warm freshwater habitat, and navigation.

13 Pursuant to the Porter-Cologne Act, the SFBRWQCB issues permits for discharges to
14 land or surface waters. The limitations placed on the discharge are designed to ensure
15 compliance with water quality objectives in the Basin Plan. To obtain a permit, the
16 discharger must submit a Report of Waste Discharge and the requirements of CEQA
17 must be met. Additionally, all dischargers must submit monitoring reports. Construction
18 activities that disturb 1 or more acres of land surface are regulated under the Statewide
19 National Pollutant Discharge Elimination System (NPDES) General Permit for Storm
20 Water Discharges Associated with Construction and Land Disturbance Activities (Order
21 No. 2012-0006-DWQ) (SWRCB 2012). This general permit also covers construction
22 activities associated with Linear Underground/Overhead Utility Projects such as
23 installation of underground pipelines, trenching, excavation, boring and drilling, and
24 stockpile/borrow locations. To obtain coverage under the Construction General Permit,
25 the legally responsible person must file a Notice of Intent (NOI), Stormwater Pollution
26 Prevention Plan (SWPPP), risk assessment, site map(s), and drawings.

27 The SWRCB's Water Quality Order 2003-003-DWQ, Statewide General Waste
28 Discharge Requirements for Discharges to Land with a Low Threat to Water Quality
29 (SWRCB 2003), addresses potential discharges of low water quality-threat wastewater.
30 Discharges that may be covered include hydrostatic test water and excavation
31 dewatering. In accordance with this permit, all dischargers must comply with all
32 applicable provisions in the Project area's Basin Plan, including any prohibitions and
33 water quality objectives for surface water and groundwater. Discharges must be made
34 to land owned or controlled by the discharger, unless the discharger has a written lease
35 or agreement with the landowner. An NOI must be filed with the regional board (in this
36 case the SFBRWQCB) prior to any wastewater discharge to land that would have low
37 water quality-threat discharges. Compliance with permit terms, including any monitoring,
38 and filing a notice of termination upon completion of the activity are also required.

1 **3.9.3 Impact Analysis**

2 ***a) Violate any water quality standards or waste discharge requirements?***

3 **Less than Significant with Mitigation.** Construction activities may affect water quality
4 in the Honker Bay receiving waters as well as within the marsh and open water habitat.
5 Project implementation, including the establishment of construction work areas and
6 staging areas, placement of rock on existing access roads, and installation of the
7 pipeline could potentially discharge sediments or pollutants into the marsh, canals, and
8 bay. In addition, the Project includes in- and over-water activities in Honker Bay.

9 Construction activities at the North Work Area would include the creation of a 200-by-
10 300-foot (approximately 1.4 acres) work pad using clean fill material to provide a level
11 and stable working surface. The North Work Area would accommodate the drilling rig,
12 generator, construction materials and equipment, three 21,000-gallon water storage
13 tanks, and the drilling fluid (“drilling mud”) mixing, pumping, and recycling equipment. In
14 the absence of proper controls, these construction activities could result in erosion and
15 sedimentation or the discharge of pollutants. Additionally, there would be two staging
16 areas located near the North Work Area to support construction activities, and
17 construction materials would be temporarily stored in these areas.

18 The South Work Area would have similar equipment located on the platform and barge
19 fleet as at the North Work Area, including mixing tank, cleaning unit, tanks, pumps, and
20 generators. Spills of diesel fuel, hydraulic oil, and lubricants could occur, potentially
21 impacting water quality, while drill muds could be released during drilling in the event of
22 an inadvertent return (see Section 3.8, Hazards). Pile installation and removal could
23 also locally increase turbidity in Honker Bay.

24 The new pipe segment would be hydrostatically tested before and after installation
25 using approximately 15,000 gallons of potable water from the City of Fairfield. The same
26 water would be used for both tests. Discharge of this water to land or water could affect
27 water quality.

28 As discussed above, construction activities could result in a discharge to land or water.
29 The following MMs would be implemented to minimize runoff pollutants at the
30 construction sites and reduce impacts.

31 **MM HWQ-1: Stormwater Pollution Prevention Plan (SWPPP).** A SWPPP
32 consistent with the Statewide National Pollution Discharge Elimination System
33 Construction General Permit (Order No. 2012-0006-DWQ) shall be developed
34 and implemented. The SWPPP shall detail the construction-phase erosion and
35 sediment control best management practices (BMPs) and the housekeeping
36 measures for control of contaminants other than sediment. Erosion control
37 BMPs shall include source control measures such as wetting of dry and dusty

1 surfaces to prevent fugitive dust emissions, preservation of existing vegetation,
2 and effective soil cover (e.g., geotextiles, straw mulch, hydroseeding) for
3 inactive areas and finished slopes to prevent sediments from being dislodged
4 by wind, rain, or flowing water. Sediment control BMPs shall include measures
5 such as installation of fiber rolls and sediment basins to capture and remove
6 particles that have already been dislodged. The SWPPP shall establish good
7 housekeeping measures such as construction vehicle storage and
8 maintenance, handling procedures for hazardous materials, and waste
9 management BMPs, which shall include procedural and structural measures to
10 prevent the release of wastes and materials used at the site. The SWPPP shall
11 also detail spill prevention and control measures to identify the proper storage
12 and handling techniques of fuels and lubricants, and the procedures to follow in
13 the event of a spill.

14 **MM HWQ-2: Hydrostatic Test Water Disposal.** Once hydrostatic testing is
15 complete, the water shall be transferred to water storage tanks, tested, and
16 discharged or disposed of as follows:

- 17 • If results from testing allow, the water shall either be discharged to
18 surrounding waters in accordance with the requirements of the Statewide
19 Construction General Permit for Stormwater Discharges Associated with
20 Construction Activity or discharged to land in accordance with the State
21 Water Resources Control Board's Statewide National Pollutant Discharge
22 Elimination System General Permit (Order 2003-0003-DWQ) for below-
23 threat water quality discharges to land.
- 24 • If a permit cannot be obtained, or if testing indicates the water contains
25 contaminants in excess of permitted levels, the water shall be hauled off
26 site for disposal at a permitted commercial disposal facility.

27 Additionally, to ensure impacts resulting from turbidity and sedimentation are minimized
28 to less than significant, **MM BIO-8** would be implemented.

29 ***b) Substantially deplete groundwater supplies or interfere substantially with***
30 ***groundwater recharge such that there would be a net deficit in aquifer volume***
31 ***or a lowering of the local groundwater table level (e.g., the production rate of***
32 ***pre-existing nearby wells would drop to a level which would not support***
33 ***existing land uses or planned uses for which permits have been granted)?***

34 **No Impact.** The Project is a short-term construction project that would not use
35 groundwater (potable water from the City of Fairfield would be used for hydrostatic
36 testing). The Project may require dewatering of the trench for the HDD entry pit in the
37 North Work Area; however, because this would be temporary and of short duration,
38 groundwater supplies would not be impacted. There are no elements of the Project that
39 would interfere with groundwater recharge; therefore, there would be no impact.

1 ***c) Substantially alter the existing drainage pattern of the site or area, including***
2 ***through the alteration of the course of a stream or river, in a manner which***
3 ***would result in substantial erosion or siltation on or off site?***

4 **Less than Significant Impact.** The Project would not alter the drainage pattern of the
5 Project area. Erosion and siltation of adjacent waters would be minimized by the
6 implementation of a SWPPP and adherence with regulatory permit conditions;
7 therefore, the impact would be less than significant.

8 ***d) Substantially alter the existing drainage pattern of the site or area, including***
9 ***through the alteration of the course of a stream or river, or substantially***
10 ***increase the rate or amount of surface runoff in a manner which would result***
11 ***in flooding on or off site?***

12 **No Impact.** The Project would not alter existing drainage patterns or increase the rate
13 or amount of stormwater runoff in a manner that would result in flooding on or off site;
14 therefore, there would be no impact.

15 ***e) Create or contribute runoff water which would exceed the capacity of existing***
16 ***or planned stormwater drainage systems or provide substantial additional***
17 ***sources of polluted runoff?***

18 **No Impact.** The Project area does not drain into any municipal stormwater drainage
19 system. The Project would not create or contribute runoff water that would exceed the
20 capacity of such systems nor would it provide substantial sources of polluted runoff.
21 Therefore, there would be no impact.

22 ***f) Otherwise substantially degrade water quality?***

23 **Less than Significant with Mitigation.** Project activities with the potential to degrade
24 water quality are discussed and addressed in Checklist Item **a)** above.

25 ***g) Place housing within a 100-year flood hazard area as mapped on a federal***
26 ***Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard***
27 ***delineation map?***

28 ***h) Place within a 100-year flood hazard area structures which would impede or***
29 ***redirect flood flows?***

30 **g) and h) No Impact.** The Project does not include housing or placing of new
31 permanent structures in the 100-year flood hazard area; therefore, there would be no
32 impact.

33 ***i) Expose people or structures to a significant risk of loss, injury or death***
34 ***involving flooding, including flooding as a result of the failure of a levee or***
35 ***dam?***

1 **No Impact.** Due to the nature and location of the Project, people and structures would
2 not be exposed to a significant risk of loss, injury, or death due to flooding risks
3 associated with dam or levee failure; therefore, there would be no impact.

4 ***j) Expose people or structures to a significant risk of loss. Injury or death***
5 ***involving inundation by seiche, tsunami, or mudflow?***

6 **No Impact.** The Project area is located in the eastern portion of Suisun Bay, which is
7 not susceptible to tsunamis (Solano County 2012). Additionally, because of the
8 relatively level topography of the site and surroundings, the potential for seiches or
9 damaging mudflows are not expected to be significant hazards in the Project area. As a
10 result, there would be no impacts from a seiche, tsunami, or mudflow.

11 **3.9.4 Mitigation Summary**

12 Implementation of the following MMs would reduce the potential for Project-related
13 impacts to Hydrology and Water Quality to less than significant:

- 14 • MM HWQ-1: Stormwater Pollution Prevention Plan (SWPPP)
- 15 • MM HWQ-2: Hydrostatic Test Water Disposal
- 16 • MM BIO-8: Turbidity and Sedimentation Minimization

1 3.10 LAND USE AND PLANNING

LAND USE AND PLANNING – Would the Project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

2 3.10.1 Environmental Setting

3 The Project is located within Suisun Marsh, north of Honker Bay, in Solano County and
 4 would extend into Honker Bay approximately 7,000 feet from shore (Figure 1-1). New
 5 pipe would be contained within existing rights-of-way or easements granted by
 6 landowners, including the CSLC, to CPL; some easements would be modified to
 7 increase widths or allow temporary work access for the Project. Temporary structures
 8 related to staging areas, work areas, and the proposed pipe string staging would be
 9 located in and north of Honker Bay and would occur on a mix of private lands, state
 10 lands, the Grizzly Island Wildlife Area (which is under the jurisdiction of CDFW), and
 11 land managed by the Suisun Marsh Preservation Agreement. Land within areas
 12 traversed by the Project consists primarily of natural lands managed for wildlife, hunting,
 13 and similar uses.

14 Under the Solano County General Plan, the Project area is within the Marsh
 15 Designation, which provides for protection of marsh and wetland areas. The designation
 16 permits aquatic and wildlife habitat; marsh-oriented recreational uses; agricultural
 17 activities compatible with the marsh environment and marsh habitat; educational and
 18 scientific research; educational facilities supportive of and compatible with marsh
 19 functions; and restoration of historic tidal wetlands. The Project area is also within the
 20 Resource Conservation Overlay, which identifies and protects areas in the County with
 21 special resource management needs. This designation recognizes the presence of
 22 certain important natural resources in the County while maintaining the validity of
 23 underlying land use designations. The overlay protects resources by requiring study of
 24 potential effects if development is proposed in these locations and providing mitigation
 25 to support urban development in cities.

1 **3.10.2 Regulatory Setting**

2 Federal and state laws and regulations pertaining to land use and planning and relevant
3 to the Project are identified in Appendix A. At the local level, Solano County land use
4 plans and regulations applicable to the Project include: the Solano County General Plan
5 (in particular the Suisun Marsh Policy Addendum), zoning regulations, and Suisun
6 Marsh Local Protection Program. Specific goals, objectives, and policies from the above
7 mentioned plans applicable to land use are discussed below.

8 Infrastructure and utilities are addressed in the Public Facilities and Services chapter of
9 the Solano County General Plan (Solano County 2008c). The General Plan's Land Use
10 Element includes the following goals and policies of relevance to this Project:

- 11 • LU.G-4: Encourage land use development patterns and circulation and
12 transportation systems that promote health and wellness and minimize adverse
13 effects on agriculture and natural resources, energy consumption, and air quality.
- 14 • LU.P-35: Promote land use and design standards that create cleaner air and
15 water and safer streets.

16 The Suisun Marsh Policy Addendum to the Solano County General Plan contains the
17 Solano County component of the Suisun Marsh Local Protection Program, which was
18 certified by BCDC on November 3, 1982, and amended on February 2, 1999 (Solano
19 County 2008a). Solano County has initiated an update of its component of the Suisun
20 Marsh Local Protection Program, but these have not yet been adopted. Of relevance to
21 this Project, the Suisun Marsh Policy Addendum, Policy 2, states that underground
22 pipelines, wires, and cables should be permitted in the Suisun Marsh if no alternative
23 route is feasible and they are designed and constructed to meet the following standards:

- 24 a. Installation of pipes, wires, and cables (particularly local service utilities) are
25 located within existing road rights-of way whenever possible.
- 26 b. All pipelines passing through the Marsh meet Pipeline Safety Regulations of the
27 U.S. Department of Transportation regarding pipe thickness, pressure limiting
28 devices, emergency shut-down valves and other safety design criteria.
- 29 c. Whenever construction occurs within the wetlands, it is confined to the dry months
30 (generally April 15 through October 15) to minimize disturbance of wetland
31 vegetation, wintering migratory waterfowl, other water-associated birds, and
32 nesting resident birds.
- 33 d. Wide-track or amphibious construction equipment is used to reduce the bearing
34 weight of the equipment unless pads are laid on the wetland area to support the
35 heavy machinery and to prevent it from sinking into the soft marsh soil. Equipment
36 movement to the construction site within the Marsh is limited to roads in the
37 immediate vicinity of the pipeline, wire, or cable being installed to minimize
38 disruption of Marsh wildlife habitat. The construction site is well defined and
39 clearly marked so that workers do not disturb adjacent Marsh areas.

- 1 e. When a trench is cut to install a pipe, wire, or cable, excavation is only slightly
- 2 wider than the utility line to be buried to minimize wetland disturbance.
- 3 f. When pipelines only are being installed across wetlands, the “trench and push”
- 4 method of construction is employed. This construction method, the least
- 5 damaging to the wetlands because it avoids the need for heavy equipment
- 6 alongside the trench to install the pipe, involves filling the excavated trench with
- 7 water and pushing or pulling the assembled pipe through the Marsh trench.
- 8 Recent pipeline installations in the Suisun Marsh, conducted under a [BCDC]
- 9 permit, indicate that this is a practical method in the Marsh.
- 10 g. Tidal marsh and managed wetlands disturbed during pipeline, wire, or cable
- 11 construction will generally revegetate naturally within one growing season if the
- 12 top layer of soil and vegetation is stockpiled when the trench is first dug and
- 13 replaced on top of the backfilled trench to facilitate revegetation. If a completed
- 14 trench is not revegetated within one growing season in a managed wetland, the
- 15 disturbed area must be reseeded with appropriate native plant seed.
- 16 h. In water areas (bays and sloughs), dredging and pipe and cable installation is
- 17 scheduled so as to avoid major fish migrations.

18 The Project area is zoned Marsh Protection (MP) under the Solano County Zoning
19 Ordinance, the purpose of which is to preserve and enhance the quality and diversity of
20 marsh habitats, within which marsh-oriented uses will be encouraged to the exclusion of
21 such other uses of land that may be in conflict with the long-term preservation and
22 protection of marsh areas. Infrastructure uses of pipelines, transmission lines, or
23 distribution lines in right-of-ways are allowable uses within the MP zone. Temporary
24 construction and infrastructure uses of “temporary facilities for the transfer of materials
25 from shore to barge” require a use permit. In addition, any development within Suisun
26 Marsh, as defined by Public Resources Code section 29114, will be subject to obtaining
27 a Marsh Development Permit pursuant to the Suisun Marsh Preservation Act of 1977.

28 **3.10.3 Impact Analysis**

29 ***a) Physically divide an established community?***

30 **No Impact.** The Project is a short-term construction project in an undeveloped area and
31 would not involve construction of any aboveground structures which would physically
32 divide an established community; therefore, there would be no impact.

33 ***b) Conflict with any applicable land use plan, policy, or regulation of an agency*** 34 ***with jurisdiction over the Project (including, but not limited to the general plan,*** 35 ***specific plan, local coastal program, or zoning ordinance) adopted for the*** 36 ***purpose of avoiding or mitigating an environmental effect?***

37 **Less than Significant with Mitigation.** The Project would replace a portion of an
38 existing, aged underground pipeline, which, over the long term, would decrease the

1 likelihood of future leaks and maintain the natural assets of the Project area. Project
2 construction methods, as described in Section 2, Project Description, are consistent
3 with Policy 2 of the Suisun Marsh Policy Addendum. Construction activities would result
4 in short-term impacts both onshore (e.g., creation of the North Work Area pad and two
5 staging areas) and offshore (e.g., creation of the South Work area pile-supported
6 platform), including placement of construction vehicles, vessels, equipment, and
7 materials; however, physical areas of impact would be restored to pre-Project conditions
8 at the end of construction. The use of HDD to install a new segment of pipe under the
9 marsh reduces the need for separate repairs using open trenching in the marsh, which
10 would be less consistent with the land use policies. The Project schedule is generally
11 based on a 7-day, 12-hour/day work week, between May and July 2017, which avoids
12 high use periods (July through February). Exceptions to this general schedule may
13 occur as described in Section 2.4.1, Construction Activities and Schedule.

14 With the implementation of **MM BIO-1** through **MM BIO-9**, as well as compliance with
15 any conditions required by other agencies with jurisdiction over the Project (see Section
16 1.7, Approvals and Regulatory Requirements), the Project would be consistent with
17 applicable plans, policies, and regulations; therefore, the impact would be less than
18 significant.

19 ***c) Conflict with any applicable habitat conservation plan or natural community***
20 ***conservation plan?***

21 **No Impact.** No adopted habitat or natural community conservation plans are applicable
22 to the Project area. The Solano County Water Agency (2012) released a draft Solano
23 Multispecies Habitat Conservation Plan for public review in 2012; as drafted, the Project
24 would not conflict with this Plan. Therefore, there would be no impact.

25 **3.10.4 Mitigation Summary**

26 Implementation of the following MMs would reduce the potential for Project-related
27 impacts to Land Use and Planning to less than significant:

- 28 • MM BIO-1: Environmental Awareness Training
- 29 • MM BIO-2: Biological Monitoring and Surveying
- 30 • MM BIO-3: Wildlife Exclusion Fencing
- 31 • MM BIO-4: Migratory Birds Avoidance
- 32 • MM BIO-5: North Work Area Vegetation Impact Minimization Plan
- 33 • MM BIO-6: Revegetation and Monitoring Plan
- 34 • MM BIO-7: Emergent Wetland Vegetation Avoidance
- 35 • MM BIO-8: Turbidity and Sedimentation Minimization
- 36 • MM BIO-9: Pile Driving Soft-Start Technique

1 **3.11 MINERAL RESOURCES**

MINERAL RESOURCES – Would the Project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

2 **3.11.1 Environmental Setting**

3 The Project is located within Suisun Marsh, north of Honker Bay, in Solano County and
 4 would extend into Honker Bay approximately 7,000 feet from shore (Figure 1-1). No
 5 identified mineral resources are within the Project area (Solano County 2008c, Figure
 6 RS-4). In the North Work Area, a work pad area would be constructed using clean fill
 7 material to provide a stable and level work surface for construction equipment and
 8 materials. Approximately 31,000 tons of 6- to 8-inch rock and 12,000 tons of 3/4-inch
 9 base rock would be used to create the work pad. The rock fill would originate from the
 10 Dutra Materials quarry in San Rafael, Marin County. Upon Project completion, the rock
 11 would be removed from the site and reused or resold.

12 **3.11.2 Regulatory Setting**

13 Federal and state laws and regulations pertaining to mineral resources and relevant to
 14 the Project are identified in Appendix A. The Dutra Materials quarry (Mine ID No. 91-07-
 15 008) is listed in the “AB 3098 List” published by the California Department of
 16 Conservation’s Office of Mine Reclamation (2016), which means it is identified as a
 17 mine regulated under the Surface Mining and Reclamation Act that meets provisions set
 18 forth under Public Resources Code section 2717, subdivision (b). At the local level, two
 19 Solano County General Plan mineral resources policies are relevant to the Project
 20 (Solano County 2008c):

- 21 • RS.P-33: The County shall preserve, for future use, areas with important mineral
 22 resources by preventing residential, commercial, and industrial development that
 23 would be incompatible with mining practices to the extent feasible.
- 24 • RS.P-34: Ensure that mineral extraction operations are performed in a manner
 25 compatible with land uses on the site and surrounding area and do not adversely
 26 affect the environment. At the end of such operations, ensure that the site is
 27 restored to conform with Surface Mining and Reclamation Act requirements and
 28 to a use compatible with surrounding land uses.

1 **3.11.3 Impact Analysis**

2 *a) Result in the loss of availability of a known mineral resource that would be of*
3 *value to the region and the residents of the State?*

4 *b) Result in the loss of availability of a locally important mineral resource*
5 *recovery site delineated on a local general plan, specific plan or other land use*
6 *plan?*

7 **a) and b) No impact.** The Project area consists of undeveloped marshes, and no
8 known mineral resources are located within or near the Project area; therefore, there
9 would be no impact.

10 **3.11.4 Mitigation Summary**

11 The Project would have no impacts to Mineral Resources; therefore, no mitigation is
12 required.

1 **3.12 NOISE**

NOISE – Would the Project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Result in exposure of persons to or generation of excessive ground-borne vibration or ground- borne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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 expose people residing or working in the Project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the Project expose people residing or working in the Project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

2 **3.12.1 Environmental Setting**

3 This section discusses impacts of Project-generated noise on humans. Noise impacts to
4 biological resources are analyzed in Section 3.4.4 of Section 3.4, Biological Resources.

5 3.12.1.1 Basics of Environmental Acoustics and Vibration

6 **Sound, Noise, and Acoustics**

7 Sound is the mechanical energy of a vibrating object transmitted by pressure waves
8 through a liquid or gaseous medium (e.g., air). Noise is defined as sound that is
9 unwanted (i.e., loud, unexpected, or annoying). Acoustics is the physics of sound. The
10 amplitude of pressure waves generated by a sound source determines the perceived
11 loudness of that source. A logarithmic scale is used to describe the SPL in terms of dB.
12 The threshold of human hearing (near-total silence) is approximately 0 dB. A doubling of
13 sound energy corresponds to an increase of 3 dB. In other words, when two sources at

1 a given location each produce sound of the same loudness, the resulting sound level at
2 a given distance from that location is approximately 3 dB higher than the sound level
3 produced by only one of the sources. For example, if one automobile produces a sound
4 pressure level of 70 dB when it passes an observer, two cars passing simultaneously do
5 not produce 140 dB; rather, they combine to produce 73 dB.

6 The perception of loudness can be approximated by filtering frequencies using the
7 standardized A-weighting network. There is a strong correlation between A-weighted
8 sound levels (expressed as dBA) and community response to noise. All noise levels
9 reported in this section are in terms of A-weighting.

10 As discussed above, doubling sound energy results in a 3-dB increase in sound. In
11 typical noisy environments, noise-level changes of 1 to 2 dB are generally not
12 perceptible by the healthy human ear; however, people can begin to detect 3-dB
13 increases in noise levels. An increase of 5 dB is generally perceived as distinctly
14 noticeable, and a 10-dB increase is generally perceived as a doubling of loudness. Four
15 sound level descriptors are commonly used in environmental noise analysis:

- 16 • Equivalent sound level (L_{eq}): An average of the sound energy occurring over a
17 specified time period. In effect, the L_{eq} is the steady-state sound level containing
18 the same acoustical energy as the time-varying sound that actually occurs during
19 the same period. The 1-hour, A-weighted equivalent sound level ($L_{eq}[h]$) is the
20 energy average of A-weighted sound levels occurring during a 1-hour period.
- 21 • Maximum sound level (L_{max}): The highest instantaneous sound level measured
22 during a specified period.
- 23 • Day-night average level (L_{dn}): The energy average of A-weighted sound levels
24 occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted
25 sound levels occurring during nighttime hours (10 p.m. to 7 a.m.).
- 26 • Community Noise Equivalent Level (CNEL): Similar to L_{dn} , CNEL is the energy-
27 average of the A-weighted sound levels occurring over a 24-hour period, with a
28 10 dB penalty applied to A-weighted sound levels occurring during the nighttime
29 hours (10 p.m. to 7 a.m.) and a 5 dB penalty applied to the A-weighted sound
30 levels occurring during evening hours (7 p.m. to 10 p.m.). The CNEL is usually
31 within 1 dB of the L_{dn} . As it is easier to compute and of more common use, the
32 L_{dn} is used as the long-term noise measure in this study.

33 Sound from a localized source (i.e., point source) propagates uniformly outward in a
34 spherical pattern, and the sound level attenuates (decreases) at a rate of 6 dB for each
35 doubling of distance from a point/stationary source. Roadways and highways and, to
36 some extent, moving trains consist of several localized noise sources on a defined path;
37 these are treated as “line” sources, which approximate the effect of several point
38 sources. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a

1 line source. Therefore, noise from a line source attenuates less with distance than noise
2 from a point source with increased distance.

3 **Ground-borne Vibration**

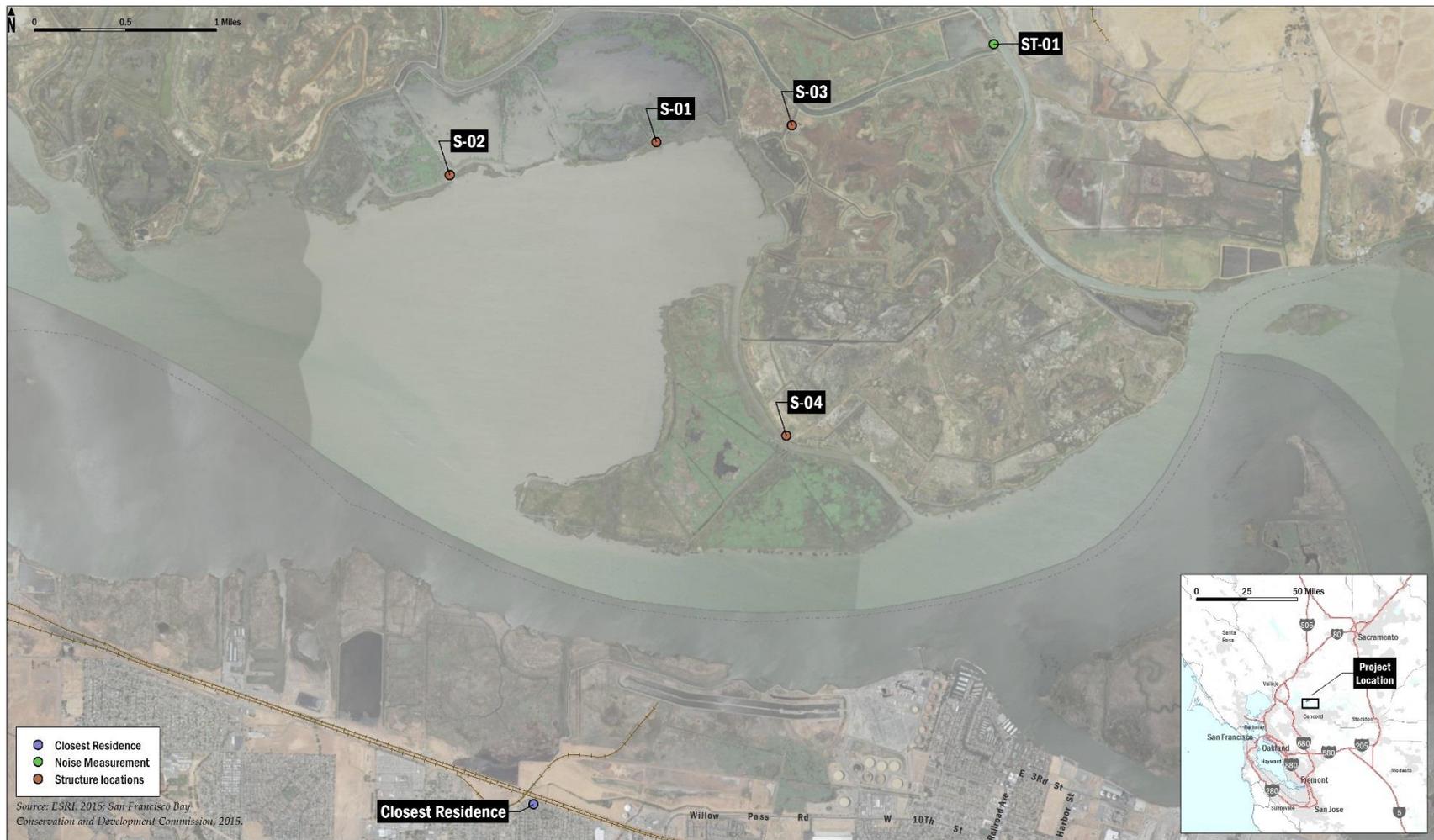
4 Ground-borne vibration is energy transmitted in waves through the ground. Vibration
5 attenuates at a rate of approximately 50 percent for each doubling of distance from the
6 source. This approach considers only the attenuation from geometric spreading and
7 tends to provide for a conservative assessment of vibration level at the receiver.
8 Vibration is an oscillatory motion that can be described in terms of the displacement,
9 velocity, or acceleration. Vibration is typically described by its peak and root-mean-
10 square (RMS) amplitudes. The RMS value can be considered an average value over a
11 given time interval. The peak vibration velocity is the same as the “peak particle
12 velocity” (PPV), generally presented in units of inches per second. PPV is the maximum
13 instantaneous positive or negative peak of the vibration signal and is generally used to
14 assess the potential for damage to buildings and structures. The RMS amplitude is
15 typically used to assess human annoyance to vibration.

16 3.12.1.2 Existing Noise Conditions

17 Noise-sensitive land uses in the Project vicinity (see Figure 1-1) include schools,
18 hospitals, rest homes, long-term care facilities, mental care facilities, and residences
19 (Solano County 2015a). The closest noise-sensitive uses to the Mallard Farm segment
20 of the BAPL are rural/agricultural residential properties south of the Honker Bay in Bay
21 Point along Port Chicago Highway; the properties are located approximately 18,000 feet
22 (3.4 miles) from the South Work Area (Figure 1.12-1). The closest structures are located
23 in four locations: approximately 1,500 feet to 4,500 feet to the east (S-01 and S-03 in
24 Figure 3.12-1), approximately 3,000 feet to the west (S-02 in Figure 3.12-1), and
25 approximately 8,000 feet to the southeast (S-04 in Figure 3.12-1). Two staging areas
26 would also be located near the North Work Area. As shown in Figure 1-2, Staging Area
27 1 would be located near the closest structure (S-01 in Figure 3.12-1) in the Project area.

28 Existing noise sources in the Project area include vehicular traffic, agricultural
29 operations, and natural noise (e.g., wildlife vocalizations, wind). No airports or airstrips
30 are near the area. Ambient noise levels were measured near existing noise-sensitive
31 uses. A short-term (15-minute) measurement of ambient noise level was conducted at
32 one site (ST-01) on March 10, 2014. The existing noise environment was dominated by
33 local and distant traffic and natural sources (e.g., wind, birds). The measured ambient
34 noise level at the Project area is 50 dBA L_{eq} or less (ST-01 in Figure 3.12-1). Given the
35 rural/agricultural nature of the land in the Project vicinity, ambient noise levels are
36 expected to be quite low—at or below 50 dBA L_{eq} , 45 dBA L_{eq} , and 40 dBA L_{eq} during
37 the daytime, evening, and nighttime hours, respectively. Figure 3.12-1 shows the
38 locations of the short-term noise measurement and structures near the Project area.

1 **Figure 3.12-1. Noise Measurement and Receptor Locations**



1 **3.12.2 Regulatory Setting**

2 Federal and state laws and regulations pertaining to noise and relevant to the Project
 3 are identified in Appendix A. Various entities address this issue area at the state and
 4 local level, as discussed below.

5 3.12.2.1 Caltrans

6 Caltrans has developed guidelines to assess the significance of vibration produced by
 7 transportation and construction sources (Table 3.12-1). These thresholds address the
 8 subjective reactions of people to both short-term vibration (e.g., from temporary
 9 construction activities) and long-term/permanent vibration (e.g., from transit operations).

Table 3.12-1. Caltrans Guidelines for Vibration Annoyance

Human Response	Impact Levels, VdB re 1 μ in/sec (PPV, in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely Perceptible	80 (0.040)	68 (0.010)
Distinctly Perceptible	96 (0.250)	80 (0.040)
Strongly Perceptible	107 (0.900)	88 (0.100)
Severe	114 (2.000)	100 (0.400)

Source: Caltrans 2013.
Acronyms: Caltrans = California Department of Transportation; μ in/sec = microinches per second; in/sec = inches per second; PPV = peak particle velocity; re: = referenced to; VdB = vibration decibels.
Notes: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

10 3.12.2.2 Solano County

11 At the local level, the Solano County General Plan Public Health and Safety chapter
 12 contains goals and policies to support the achievement of those goals (Solano County
 13 2015a). The noise reduction and abatement strategy focuses on the following
 14 preventative techniques to protect noise-sensitive land uses from noise-producing
 15 sources: developing strategies for reducing excessive noise exposure through cost-
 16 effective measures and appropriate zoning that avoids placing incompatible land uses in
 17 proximity to each other; protecting existing regions of the County where noise levels are
 18 currently acceptable and also locations that are deemed noise-sensitive; protecting
 19 existing noise-generating commercial and industrial uses from encroachment of new
 20 noise-sensitive developments; preventing new noise-generating commercial and
 21 industrial uses in Solano County from encroaching on noise-sensitive land uses; and
 22 providing sufficient information regarding existing and future community noise levels so
 23 that noise may be effectively considered in land use planning. Relevant policies include:

- 1 • Policy HS.G-3: Protect people living, working, and visiting Solano County from
 - 2 the harmful impacts of excessive noise; and
 - 3 • Policy HS.G-4: Protect important agricultural, commercial, and industrial uses in
 - 4 Solano County from encroachment by land uses sensitive to noise...impacts.
- 5 Table HS-3 in the County General Plan (see Table 3.12-2) shows acceptable noise
- 6 levels for various land use categories and is used to determine project noise impacts.

Table 3.12-2. Land Use Noise Compatibility Guidelines

Land Use Category	Community Noise Exposure (L _{dn} or CNEL, dBA)			
	Acceptable		Unacceptable	
	Normally ¹	Conditionally ²	Normally ³	Clearly ⁴
Residential—Low-Density Single Family, Duplex, Mobile Home	<60	55–70	70–75	75+
Residential—Multifamily	<65	60–70	70–75	75+
Transient Lodging—Motel, Hotel	<65	60–70	70–80	80+
Schools, Libraries, Churches, Hospitals, Nursing Homes	<70	60–70	70–80	80+
Auditoriums, Concert Halls, Amphitheaters	–	<70	65+	–
Sports Arena, Outdoor Spectator Sports	–	<75	70+	–
Playgrounds, Neighborhood Parks	<70	–	67.5–75	72.5+
Golf Courses, Riding Stables, Water Recreation, Cemeteries	<75	–	70–80	80+
Office Building, Business Commercial, and Professional	<70	67.5–77.5	75+	–
Industrial, Manufacturing, Utilities, Agriculture	<75	70–80	75+	–

Source: Solano County General Plan, Public Health and Safety Chapter, 2015b.

Acronyms: CNEL = community noise equivalent level; dBA = A-weighted decibel; L_{dn} = day-night average noise level.

Notes:

¹ Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

² New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.

³ New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Outdoor areas must be shielded.

⁴ New construction or development should generally not be undertaken. These standards are not applicable for development within the airport compatibility review area. Development in the airport compatibility review area is subject to standards in the applicable airport land use plan.

1 The General Plan (Table HS-4 [see Table 3.12-3 below]) also establishes noise
 2 standards for non-transportation noise standards.

Table 3.12-3. Noise Standards for New Uses Affected by Traffic/Railroad Noise

New Land Use	Sensitive Area (L _{dn} , dBA)		Notes
	Outdoor	Interior ¹	
All Residential	65	45	2
Transient Lodging	65	45	2, 3
Hospitals and Nursing Homes	65	45	2, 3, 4
Theaters and Auditoriums	–	35	3
Churches, Meeting Halls, Schools, Libraries, etc.	65	40	3
Office Buildings	65	45	3
Commercial Buildings	–	50	3
Playgrounds, Parks, etc.	70	–	
Industry	65	50	3

Source: Solano County General Plan, Public Health and Safety Chapter, 2015.
Acronyms: dBA = A-weighted decibels; L_{dn} = day-night average noise level.
Notes:
¹ Interior-noise-level standards are applied within noise-sensitive areas of the various land uses, with windows and doors in the closed positions.
² If these uses are affected by nighttime railroad passages, the potential for sleep disturbance shall be addressed.
³ Where there are no sensitive exterior spaces proposed for these uses, only the interior-noise-level standard shall apply.
⁴ The exterior-noise-level standards for hospitals, which are often noise-generating uses, are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.

3 The General Plan provides several types of noise standards in tables. For clarity of
 4 reference, this analysis uses the table numbers used in this section rather than the table
 5 numbers from the General Plan. County Municipal Code, Chapter 28.70 also includes
 6 regulations and standards to control unnecessary, excessive, and annoying noise and
 7 vibration in the unincorporated County: pursuant to Chapter 28.70.10B, any use of land
 8 or buildings must meet the applicable performance standards listed below:

- 9 • 1b: All uses of land and buildings shall be conducted in a manner, and provide
 10 adequate controls and operational management to prevent...noise that exceeds
 11 65dB L_{dn} at any property line.

12 The County’s intent is to maintain quiet in areas that exhibit low noise levels, and to
 13 implement programs to reduce noise in areas within the County where noise levels are
 14 above acceptable limits. The code provides regulations that establish required ambient
 15 noise levels and maximum allowable noise levels based on the land use.

1 **3.12.3 Impact Analysis**

2 **a) Result in exposure of persons to or generation of noise levels in excess of**
 3 **standards established in the local general plan or noise ordinance, or**
 4 **applicable standards of other agencies?**

5 **Less than Significant Impact.** As described in Section 1, Project Description,
 6 construction would include diesel-powered drill rigs, control units, mud-cleaner systems,
 7 de-silters, generators, forklifts, backhoes, a pipe trailer, cranes, a bulldozer, de-watering
 8 tanks and pumps, and a track excavator. Construction activities at the North and South
 9 Work Areas would occur 7 days a week, typically from 7:00 a.m. to 7:00 p.m. Certain
 10 activities such as hydrostatic testing and pipe tie-ins could exceed a 12-hour day;
 11 installation of the 7,000-foot segment of replacement pipe may involve continuous
 12 activity for an approximate 24-hour period. Table 3.12-4 summarizes typical noise levels
 13 produced by the on-land and on-water construction equipment for the Project.

Table 3.12-4. Typical Construction Noise Emission Levels

Equipment		Typical Noise Level (L_{max})/ L_{eq} ¹	Acoustical Use Factor
On Land	Dozer	85/81	40
	Backhoe	80/76	50
	Dump Truck	84/80	50
	Crane	81/77	50
	Tugboat ²	91/87	40
On Water	Crane	81/77	50
	Pile Driver ³	101/97	50
	Workboat ⁴	75/55	50
	Generator	82/79	50
	Air Compressor	80/76	50

Source: Federal Highway Administration 2006.

Notes: L_{max} = maximum instantaneous noise level during a specific period of time; L_{eq} = Equivalent Noise Level.

¹ dBA, A-weighted decibel level, measured at 50 feet.

² Calculated for tugboat using 1,000 hp reciprocating engine with muffler (Hoover and Keith 2000).

³ Actual measured average noise levels are similar for impact pile driving and vibratory pile driving. Typical noise levels for vibratory (sonic) pile driving and for impact pile driving would be would be 96 dBA and 101 dBA, respectively. Worst case scenario was conservatively assumed in this analysis.

⁴ Based on data for pickup truck.

14 L_{max} sound levels at 50 feet are shown along with the typical acoustic use factor. The
 15 acoustic use factor is the percentage of time each piece of construction equipment is
 16 assumed to be operating at full power (i.e., its loudest condition) during construction and
 17 is used to estimate L_{eq} values from L_{max} values. For example, the L_{eq} value for a piece of
 18 equipment that operates at full power 50 percent of the time (acoustical use factor of 50)
 19 is 3 dB less than the L_{max} value.

1 The closest residential receptors to the Project area are in the Contra Costa County
2 community of Bay Point to the south (outside the Solano County boundary) more than
3 18,000 feet and 25,000 feet (3.5 and 4.7 miles) from the Project's South and North
4 Work Areas, respectively. The Contra Costa County Noise Ordinance allows for
5 construction noise to occur between 7:00 a.m. and 7:00 p.m. on weekdays and between
6 9:00 a.m. and 7:00 p.m. on weekends, which would not be considered a significant
7 noise impact. However, because work may occur outside of the 7:00 a.m. to 7:00 p.m.
8 window, the more conservative Land Use Noise Compatibility Guidelines presented in
9 Table 3.12-2 are used to determine if a Project-related noise impact is significant.

10 Noise from equipment operations on land and on the water is estimated based on the
11 three loudest pieces of equipment likely to operate at the same time. For equipment on
12 land, the total noise level for a dozer, backhoe, and dump truck is 87 dBA L_{eq} at 50 feet.
13 This corresponds to a sound level of 33 dBA L_{eq} at a distance of 25,000 feet, which is
14 the distance of the closest residences. This level of noise is below applicable daytime
15 noise thresholds for residences (Table 3.12-2). Installation of the pipe in the drilled hole
16 (called the "pullback") would occur during the night. For this activity, the new pipe string
17 would be lifted by crane, which would be the noisiest equipment for the nighttime
18 construction activities. The noise level for a crane is 78 dBA L_{eq} at 50 feet. This
19 corresponds to a sound level of 24 dBA L_{eq} at a distance of 25,000 feet, which is the
20 distance to the closest residences. This level of noise is below applicable nighttime
21 thresholds for residences (Table 3.12-2). Therefore, this impact would be less than
22 significant.

23 For construction equipment on the water, noise from the tugboat, crane, and barge with
24 a vibratory pile driver has been summed to develop a reasonable worst-case noise level
25 for on-water construction activities. For this equipment, the total noise level is 97 dBA
26 L_{eq} at 50 feet. This corresponds to a sound level of 51 dBA at a distance of 18,000 feet,
27 which is the distance to the closest residences. This level of noise is below any
28 applicable daytime thresholds for residences (Table 3.12-2). Therefore, this impact
29 would be less than significant.

30 With respect to construction-related traffic noise, during initial equipment mobilization
31 there would be approximately 30 truck trips over a 6-day period (five trucks per day,
32 approximately 1 truck every 2 hours assuming 12 hours of construction per day) via
33 public roads to Grizzly Island Road. The staging areas are on privately owned land,
34 accessible only through locked gates. The staging area locations would be accessible
35 using existing paved, graveled, and dirt roads. Construction would require a crew of
36 about 50 persons, distributed between the North and South Work Areas. HDD of the
37 borehole would require a crew of about 50 persons with about 23 working from the
38 North Work Area and 27 from the South Work Area. This would result in a total of 51
39 trips during the morning when construction workers arrive at the site and 51 trips during
40 the afternoon after construction is finished for the day.

1 In a worst-case scenario, construction-related traffic would result in approximately 51
2 vehicle trips per hour to and from the Project areas, which assumes all construction-
3 related traffic occurs in the same hour and would all be going to the North Work Area
4 (when in fact only 23 vehicles would be going to the North Work Area). This level of
5 traffic volume would produce traffic noise levels of approximately 51 dB L_{eq} at 50 feet
6 from the centerline of the roadways that would be used by Project-related construction
7 traffic. There are residences within 50 feet of Grizzly Island Road in the Project area.
8 However, traffic noise exposure at the closest noise-sensitive receivers (residences) to
9 the roadways used by the Project-related construction traffic is not anticipated to
10 increase beyond the applicable County land use compatibility threshold of 60 dB L_{dn} as
11 a result of the construction traffic. Therefore, the impact of construction vehicle
12 movements is considered less than significant.

13 With respect to interior noise impacts, typical residential construction (i.e., wood siding
14 or two-coat stucco, STC 30-31 windows, door weather-stripping and thresholds, exterior
15 wall insulation, composition plywood roof) would be expected to provide an exterior-to-
16 interior noise level reduction of no less than 25 dB with exterior doors and windows
17 closed (USEPA 1974). Therefore, construction noise levels of 70 dB L_{eq} or less at
18 residential building facades would not exceed the interior noise level standard of 45 dB
19 (70 dB - 25 dB = 45 dB). As noted above the construction noise levels from either the
20 North or South Work Areas would be well below 70 dB L_{eq} at residential building
21 facades (Table 3.12-2). Therefore, this impact would be less than significant.

22 ***b) Result in exposure of persons to or generation of excessive ground-borne***
23 ***vibration or ground-borne noise levels?***

24 **Less than Significant Impact.** The Transit Noise and Vibration Impact Assessment
25 (Federal Transit Administration [FTA] 2006) and Transportation- and Construction-
26 Induced Vibration Guidance Manual (Caltrans 2013) are two seminal works on the
27 analysis of ground-borne noise and vibration relating to transportation- and
28 construction-induced vibration. The Project is not subject to FTA or Caltrans regulations;
29 however, these documents serve as useful tools for evaluating vibration impacts. For
30 this reason, they are used to assess the vibration impacts of the Project. Caltrans
31 guidelines recommend that a standard of 0.2 inch per second PPV not be exceeded for
32 the protection of normal residential buildings (Caltrans 2013). With respect to human
33 response within residential uses (i.e., annoyance, sleep disruption), the FTA (2006)
34 recommends a maximum acceptable vibration standard of 80 vibration decibels (VdB).

35 No permanent increase in ground-borne vibration would result from the Project. Project
36 construction may result in varying degrees of temporary ground vibration, depending on
37 the specific equipment used and operations involved. Ground-borne vibration levels
38 caused by various types of equipment are summarized in Table 3.12-5.

Table 3.12-5. Typical Construction Equipment Vibration Levels

Equipment	PPV at 25 feet (in/sec)	Approximate L _v at 25 feet
Haul Trucks	0.076	86
Large Bulldozer	0.089	87
Caisson Drilling	0.089	87
Jackhammer	0.035	79
Small Bulldozer	0.003	58
Pile Driver (Impact; upper range) ¹	1.518	112
Pile Driver (Impact; typical) ¹	0.644	104

Source: Federal Transit Administration (FTA) 2006.
Acronyms: in/sec = inches per second; L_v = velocity level in decibels (VdB) referenced to 1 microinch per second and based on the root mean square velocity amplitude; PPV = peak particle velocity.
Note: ¹ Vibration levels for vibratory pile driving would be 93 VdB (typical) to 105 VdB (upper range). Worst case scenario was conservatively assumed in this analysis.

1 Project construction-related vibration would result from the use of heavy equipment for
 2 area clearing, grading, earthmoving, and pile driving. These activities would produce a
 3 maximum vibration level of approximately 112 VdB (1.518 inch per second PPV) at a
 4 distance of 25 feet (which is the reference vibration level for the operation of an impact
 5 pile driver [upper range] [FTA 2006; Caltrans 2013]). The distance between proposed
 6 construction activities and the closest acoustically vibration-sensitive use would be
 7 approximately 1,500 feet (the distance to S-01 to the east of the Project site, Figure
 8 3.12-1). Assuming a standard reduction of 9 VdB per doubling of distance (FTA 2006),
 9 the Project-related construction vibration level at this receiver would be approximately
 10 0.003 inch per second PPV or 59 VdB. This is below the recommended threshold of
 11 significance of 80 VdB noted above (Table 3.12-1). Therefore, this impact would be less
 12 than significant.

13 ***c) Result in a substantial permanent increase in ambient noise levels in the***
 14 ***Project vicinity above levels existing without the project?***

15 **No Impact.** The Project involves short-term construction activities and would not
 16 introduce any permanent sources of noise or alter the local environment, such as by
 17 increasing the noise production/exposure associated with existing, permanent sources
 18 of noise in the Project area. Therefore, there would be no impact.

19 ***d) Result in a substantial temporary or periodic increase in ambient noise levels***
 20 ***in the Project vicinity above levels existing without the project?***

21 **Less than Significant Impact.** As discussed above, the existing noise environment in
 22 the Project area is dominated by local and distant traffic and natural sources (e.g., wind,
 23 birds). The measured ambient noise level in the Project area was 50 dBA L_{eq} or less.
 24 Given the existing rural and agricultural land uses in the area, ambient noise levels at
 25 the existing rural residential properties in the vicinity of the Project area are expected to

1 be approximately 50 dBA L_{eq} , 45 dBA L_{eq} , and 40 dBA L_{eq} , respectively, during the
2 daytime (7 a.m. to 7 p.m.), evening (7 p.m. to 10 p.m.), and nighttime (10 p.m. to 7 a.m.)
3 hours. However, no noise-sensitive uses are near the Project area. The nearest
4 residences are in the community of Bay Point along the Union Pacific Railroad (UPRR),
5 approximately 18,000 feet from the South Work Area and 25,000 feet from the North
6 Work Area. The ambient noise levels at this residential area along the UPRR and to the
7 north of State Route (SR) 4 are expected to be above 50 dBA L_{eq} , 45 dBA L_{eq} , and 40
8 dBA L_{eq} , respectively, during the daytime (7 a.m. to 7 p.m.), evening (7 p.m. to 10 p.m.),
9 and nighttime (10 p.m. to 7 a.m.) hours. Given the existing urban and industrial land
10 uses in the area, and as a conservative assumption, the ambient noise levels at the
11 closest residential properties in the vicinity of the Project area are expected to be
12 approximately 55 dBA L_{eq} , 50 dBA L_{eq} , and 45 dBA L_{eq} , during the daytime (7 a.m. to 7
13 p.m.), evening (7 p.m. to 10 p.m.), and nighttime (10 p.m. to 7 a.m.) hours, respectively.

14 As stated above, Project-related construction noise levels at 18,000 feet (the distance to
15 the closest residences from the South Work Area), would be up to 51 dBA L_{eq} .
16 Installation of the pipe in the drilled hole (called the “pullback”) would occur during the
17 night. For this activity, the new pipe string would be lifted by crane, which would be the
18 noisiest equipment for the nighttime construction activities. The noise level for a crane is
19 78 dBA L_{eq} at 50 feet. This corresponds to a sound level of 24 dBA L_{eq} at a distance of
20 25,000 feet, which is the distance to the closest residences from the North Work Area
21 where this activity would take place. These levels of noise are well below the
22 conservatively assumed ambient noise levels of 55 dBA L_{eq} , 50 dBA L_{eq} , and 45 dBA
23 L_{eq} , during the daytime (7 a.m. to 7 p.m.), evening (7 p.m. to 10 p.m.), and nighttime (10
24 p.m. to 7 a.m.) hours, respectively. Therefore, this impact would be less than significant.

25 ***e) For a project located within an airport land use plan or, where such a plan has***
26 ***not been adopted, within 2 miles of a public airport or public use airport,***
27 ***would the project expose people residing or working in the project area to***
28 ***excessive noise levels?***

29 ***f) For a project within the vicinity of a private airstrip, would the project expose***
30 ***people residing or working in the project area to excessive noise levels?***

31 **e) and f) No Impact.** The Project site is not located within 2 miles or in the vicinity of a
32 public airport or private airstrip. Also, the Project would not involve any aircraft uses for
33 construction or operations, affect any airport or airstrip operations, or expose people on
34 or off site to excessive aircraft noise levels. Therefore, there would be no impact.

35 **3.12.4 Mitigation Summary**

36 The Project would not result in significant impacts to Noise; therefore, no mitigation is
37 required.

1 **3.13 POPULATION AND HOUSING**

POPULATION AND HOUSING – Would the Project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Induce substantial 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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

2 **3.13.1 Environmental Setting**

3 The Project is located within Suisun Marsh, north of Honker Bay, in Solano County and
4 would extend into Honker Bay approximately 7,000 feet from shore (Figure 1-1). Solano
5 County’s population grew from 394,542 to 413,344 people from 2000 to 2010. In 2010,
6 the average household in the County had 3.33 persons per household. There were
7 141,758 households and 152,698 total housing units in the County, with an overall
8 housing vacancy rate of 7.2 percent (Bay Area Census 2016). The nearest housing to
9 the Project area is located in the community of Bay Point, located approximately 3.5
10 miles south of the South Work Area, and Honker Bay in Contra Costa County. The
11 Solano County cities of Benicia, Suisun City, Fairfield, and Rio Vista generally surround
12 the Project area, the closest of which (Benicia) lies approximately 10.5 miles west of the
13 Project area.

14 **3.13.2 Regulatory Setting**

15 No federal or state laws relevant to this issue area are applicable to the Project. At the
16 local level, the Solano County General Plan Housing Element (Solano County 2015b)
17 addresses housing needs in the unincorporated areas of the County surrounding the
18 Project site; however, because the Project is a short-term pipeline replacement project,
19 there are no relevant goals, objectives, or policies applicable to Project activities.

20 **3.13.3 Impact Analysis**

21 ***a) Induce substantial population growth in an area, either directly (for example,***
22 ***by proposing new homes and businesses) or indirectly (for example, through***
23 ***extension of roads or other infrastructure)?***

1 **No Impact.** The Project would not induce substantial population growth in the area,
2 either directly or indirectly. The Project is short-term and would not provide new housing
3 or long-term employment. Short-term construction employment opportunities would be
4 created, many of which would be for persons with specialized skills (e.g., marine vessel,
5 equipment operators) that are expected to come from the Project region. Therefore,
6 there would be no impact.

7 ***b) Displace substantial numbers of existing housing, necessitating the***
8 ***construction of replacement housing elsewhere?***

9 **No Impact.** The Project would not displace existing housing, necessitating the
10 construction of replacement housing elsewhere as the Project would take place within
11 Suisun Marsh and Honker Bay. Therefore, there would be no impact.

12 ***c) Displace substantial numbers of people, necessitating the construction of***
13 ***replacement housing elsewhere?***

14 **No Impact.** The Project would not displace substantial numbers of people,
15 necessitating the construction of replacement housing elsewhere. As previously
16 discussed, the Project is a short-term pipeline replacement project that would take place
17 within Suisun Marsh and Honker Bay. Therefore, there would be no impact.

18 **3.13.4 Mitigation Summary**

19 The Project would have no impacts to Population and Housing; therefore, no mitigation
20 is required.

1 **3.14 PUBLIC SERVICES**

PUBLIC SERVICES	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police Protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

2 **3.14.1 Environmental Setting**

3 The Project is located within Suisun Marsh, north of Honker Bay, in Solano County and
 4 extends into Honker Bay approximately 7,000 feet from the shore (Figure 1-1). Onshore
 5 and offshore service providers are listed below in Table 3.14-1.

Table 3.14-1. Summary of Public Service Providers

Service	Provider(s)
Fire Protection	Suisun Fire Protection District (FPD), Montezuma FPD, and Cordelia FPD
Police Protection	Solano County Sheriff’s Department
Schools	Fairfield-Suisun Unified School District
Parks	Solano County Parks
Other: Maritime Law Enforcement	Solano County Sheriff’s Marine Patrol Program

6 **3.14.1.1 Fire Protection**

7 The California State Department of Forestry and Fire Protection (CAL FIRE) provides
 8 fire protection to several unincorporated communities in Solano County. The Project
 9 area is primarily within the jurisdiction of Suisun Fire Protection District (FPD). The
 10 eastern and western portions of Suisun Marsh are serviced by the Montezuma FPD and
 11 Cordelia FPD, respectively. The Suisun FPD has two fire stations located in Suisun
 12 Valley and Fairfield. Montezuma FPD has four stations, one in Rio Vista and three in the
 13 County. Cordelia FPD has two stations, one in Suisun Valley and one in Old Town

1 Cordelia. In the event of a fire emergency, the Suisun, Montezuma, and Cordelia fire
2 departments would coordinate with one another to determine the location of the fire and
3 the appropriate FPD to respond, based on jurisdiction.

4 3.14.1.2 Police Protection

5 The Solano County Sheriff's Department is responsible for law enforcement in
6 unincorporated areas of Solano County and on Delta waterways, including Suisun
7 Marsh. Emergency response uses vehicles or boats, depending on the location's
8 accessibility, predicted response time, and availability of resources. The main Sheriff's
9 office is located in Fairfield. Police protection services are also provided by California
10 Highway Patrol (CHP) from their Solano Office in Fairfield. The Solano CHP has
11 jurisdiction from the west end of the City of Davis to the Benicia Bridge and Carquinez
12 Bridge. Per the Penal Code, the County Sheriff's Department is responsible for criminal
13 offenses in unincorporated Solano County (e.g., robberies, rapes, and murders), while
14 the Solano CHP is responsible for traffic-related offenses (e.g., traffic accidents).

15 3.14.1.3 Schools

16 The Fairfield-Suisun Unified School District provides elementary, middle, and high
17 school education in the vicinity of the Project area. The district consists of 30 schools,
18 including 17 elementary schools, four middle schools, three high schools, and several
19 alternative schools. There are no schools adjacent to the Project area. The closest
20 school to the Project area within the Fairfield-Suisun Unified School District is the
21 Crescent Elementary School, located 11 miles north of the Project's North Work Area
22 (Fairfield-Suisun Unified School District 2016).

23 3.14.1.4 Parks

24 Impacts to parks are discussed in Section 3.15, Recreation.

25 3.14.1.5 Maritime Law Enforcement

26 The Solano County Sheriff's Marine Patrol Program provides public safety resources to
27 recreational boaters and commercial vessels operating on the navigable waterways in
28 the County. The Marine Patrol Program is staffed with four full-time deputies. The
29 program is operational 10 hours each day, 7 days each week, year-round, and provides
30 professional public safety services to the community.

31 **3.14.2 Regulatory Setting**

32 Federal and state laws and regulations pertaining to public services and relevant to the
33 Project are identified in Appendix A. At the local level, the Solano County General
34 Plan's Public Facilities and Services and Public Health and Safety Elements provide

1 goals, policies, and actions with regard to public services (Solano County 2008c). Such
2 goals include providing adequate public services and facilities to accommodate the level
3 of development planned by the County, providing effective and responsive fire and
4 police protection, and minimizing the potential loss of life and property resulting from
5 natural or human-caused hazards.

6 **3.14.3 Impact Analysis**

7 ***a) Would the Project result in substantial adverse physical impacts associated***
8 ***with the provision of new or physically altered governmental facilities, need***
9 ***for new or physically altered governmental facilities, the construction of which***
10 ***could cause significant environmental impacts, in order to maintain***
11 ***acceptable service ratios, response times or other performance objectives for***
12 ***any of the public services?***

- 13 • **Fire protection?**
- 14 • **Police Protection?**
- 15 • **Schools?**
- 16 • **Parks?**
- 17 • **Other public facilities?**

18 **No Impact.** The Project is a short-term pipeline replacement project that does not involve
19 the construction of any residences, buildings, or infrastructure. The Project is short-term
20 and would not require any additional services outside of those mentioned above and
21 currently available. Therefore, there would be no impacts.

22 **3.14.4 Mitigation Summary**

23 The Project would have no impacts to Public Services; therefore, no mitigation is
24 required.

1 **3.15 RECREATION**

RECREATION	Potentially Significant Impact	Less Than Significant with Mitigation	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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

2 **3.15.1 Environmental Setting**

3 The Project is located within Suisun Marsh, north of Honker Bay, in Solano County and
 4 extends into Honker Bay approximately 7,000 feet from the shore (Figure 1-1). The
 5 northern portion of the Project area (those portions north of Roaring River, including the
 6 North Work Area) is within the Grizzly Island Wildlife Area. This CDFW-managed area
 7 contains approximately 12,900 acres of prime marshland habitat and is used for nature
 8 viewing, hiking, photography, dog training, fishing, and hunting (CDFW 2016b). Grizzly
 9 Island Wildlife Area has very active, robust hunting seasons, during which access to the
 10 Grizzly Island Wildlife Area is heavily restricted by CDFW. Elk hunting season begins in
 11 late July and continues through late September, and waterfowl hunting season begins in
 12 October and continues through the end of February.

13 **3.15.2 Regulatory Setting**

14 No federal or state laws relevant to this issue area are applicable to the Project. At the
 15 local level, the Solano County General Plan’s Park and Recreation Element addresses
 16 goals, policies, and objectives relating to park and recreation facilities, the following of
 17 which are of relevance to the Project (Solano County 2008d):

- 18 • 3C: The County shall work to protect identified recreational sites and natural
 19 resource areas.
- 20 • 5A: The County shall make the optimum use of public lands by developing or
 21 promoting development of facilities that are compatible with the primary
 22 resources of the site.
- 23 • 5B: The County shall support passive and active recreational uses that are
 24 compatible with the primary resources of the land.

1 The Resources Element also contains goals and policies relating to recreation, the
2 following of which is of relevance to the Project (Solano County 2008b):

- 3 • RS.P-48: Maintain and expand public access and recreational activities within the
4 Suisun Marsh consistent with applicable marsh policies and the protection of
5 wildlife resources.

6 **3.15.3 Impact Analysis**

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

10 **No Impact.** As a result of construction activities in the area, it is possible that
11 construction workers may utilize nearby park and recreation facilities in the short term;
12 however, due to the limited number of workers and the short-term nature of the Project,
13 the Project would not increase the use of existing parks or recreational facilities such
14 that substantial physical deterioration of the facility would occur or be accelerated.
15 Therefore, there would be no impact.

16 It is noted that CDFW heavily restricts access to the Grizzly Island Wildlife Area during
17 the hunting seasons. Because of these access restrictions the only periods available
18 with open and safe access to the North Work Area are during the spring and early
19 summer months. Project construction is anticipated to begin in May 2017 and finish in
20 July 2017, and would avoid impacts on recreational uses of the area.

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

24 **No Impact.** The Project does not include recreational facilities or require construction or
25 expansion of recreational facilities which might have an adverse physical effect on the
26 environment; therefore, there would be no impact.

27 **3.15.4 Mitigation Summary**

28 The Project would have no impacts to Recreation; therefore, no mitigation is required.

1 **3.16 TRANSPORTATION/TRAFFIC**

TRANSPORTATION/TRAFFIC – Would the Project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

2 **3.16.1 Environmental Setting**

3 The Project is located within Suisun Marsh, north of Honker Bay, in Solano County and
 4 extends into Honker Bay approximately 7,000 feet from the shore (Figure 1-1). The
 5 Project area has very limited road access, and the only road access from the north is
 6 the two-lane Grizzly Island Road. From Grizzly Island Road, access to the North Work
 7 Area is via private dirt and gravel levee roads. The alternative transport route to the
 8 Project area is the Sacramento River and Honker Bay. Both road and water transport
 9 would be used for the Project.

1 3.16.1.1 North Work Area

2 All equipment and work crews transported to the North Work Area would use public
3 highways and local roads; highways that workers may use to access the Project area
4 include I-80 and SR 12 through Fairfield and Suisun City. The Annual Average Daily
5 Traffic (AADT) volume on SR 12 between the junction with I-80 and Grizzly Island Road
6 is between 32,500 and 38,000 vehicles (Caltrans 2016). In the Project area, equipment
7 would be transported along Grizzly Island Road (from SR 12) and levee roads to the
8 North Work Area (see Figure 1-2 for access routes). Workers assigned to the North
9 Work Area would drive to the Grizzly Island Wildlife Area via Grizzly Island Road, park
10 at a designated work crew parking area at the hunting control station (see Figure 1-1),
11 then travel by multi-passenger vans to the North Work Area.

12 3.16.1.2 South Work Area

13 Construction materials and equipment for use at the South Work Area would be staged
14 and loaded for transport at the Dutra commercial fabrication yard in Rio Vista on the
15 Sacramento River, northeast of the Project area (see Figure 1-1). Materials would then
16 be transported from the Dutra docks by barge down the Sacramento River into Honker
17 Bay and directly to the South Work Area platform. The work crew at the South Work
18 Area would leave from the McAvoy Marina in Bay Point immediately south of the Project
19 area and be transported by boat to the work platform and barges. Access to the McAvoy
20 Marina would be from SR 4, Willow Pass Road, and Port Chicago Highway. The AADT
21 volume on SR 4 between Port Chicago Highway and Railroad Avenue ranges between
22 115,000 and 153,000 vehicles (Caltrans 2016).

23 **3.16.2 Regulatory Setting**

24 Federal and state laws and regulations pertaining to transportation and traffic and
25 relevant to the Project are identified in Appendix A. Various entities address this issue
26 area at the local level, as discussed below.

27 3.16.2.1 Metropolitan Transportation Commission (MTC)

28 The MTC adopted the current regional transportation plan, Plan Bay Area, which charts
29 a course for transportation investment and land-use priorities for the next 25 years.
30 Adopted in 2013, Plan Bay Area is the first regional plan to incorporate a State-
31 mandated Sustainable Communities Strategy (ABAG and MTC 2013).

32 3.16.2.2 Solano Transportation Authority (STA)

33 The 2005 Comprehensive Transportation Plan (CTP) 2030 for Solano County (STA
34 2005) envisions, directs, and prioritizes the County's transportation needs, with a goal to
35 develop a balanced transportation system that reduces congestion and improves

1 access and travel choices through the enhancement of roads. The CTP incorporates
2 various STA studies and plans into a 25-year planning document that describes existing
3 and future needs for the major arterials, highways, and freeways in the County.

4 3.16.2.3 County of Solano

5 The Transportation and Circulation chapter of the Solano County General Plan
6 addresses circulation concerns (Solano County 2008e). The following goal is of
7 relevance to the Project:

- 8 • Goal TC.G-4: Encourage the use of alternative forms of transportation such as
9 transit, walking, and bicycling to alleviate congestion and promote recreation.

10 3.16.3 Impact Analysis

11 ***a) Conflict with an applicable plan, ordinance or policy establishing measures of***
12 ***effectiveness for the performance of the circulation system, taking into***
13 ***account all modes of transportation including mass transit and non-motorized***
14 ***travel and relevant components of the circulation system, including but not***
15 ***limited to intersections, streets, highways and freeways, pedestrian and***
16 ***bicycle paths, and mass transit?***

17 **No Impact.** The Project would not conflict with any transportation plans nor would it
18 change traffic patterns or roadway design; therefore, there would be no impact.

19 ***b) Conflict with an applicable congestion management program, including, but***
20 ***not limited to level of service standards and travel demand measures, or other***
21 ***standards established by the county congestion management agency for***
22 ***designated roads or highways?***

23 **Less than Significant Impact.** Regional access to the North Work Area would be via
24 SR 12. During initial equipment mobilization, approximately 30 truck trips would occur
25 on SR 12 and Grizzly Island Road over a 6-day period (five trucks per day). During
26 construction, there would be approximately 23 workers per day at the North Work Area,
27 generating up to 23 round trips per day via SR 12 and a portion of Grizzly Island Road
28 (up to the Hunting Control Station, where workers would park and van pooling would
29 start). Vans would then enter a locked gate near the Montezuma Slough Salinity Control
30 Structure (see Figure 1-2). Past this gate, all access points to the North Work Area and
31 staging areas are on privately-owned land accessible only through locked gates.
32 Because the North Work Area is not accessible by the public, traffic control is not
33 anticipated. Regional access to the South Work Area would be via SR 4, Willow Pass
34 Road, and Port Chicago Highway. Approximately 27 workers per day would work at the
35 South Work Area, generating up to 27 round trips per day to McAvoy Marina.

1 The Project would create a minimal increase in vehicles on the roads, which would be
2 temporary (approximately 3 months) and extremely small (approximately .07 percent for
3 roads serving the North Work Area and .02 percent for roads serving the South Work
4 Area) in comparison to the average daily traffic volume. The amount of traffic potentially
5 conflicting with an applicable congestion management program for designated roads or
6 highways would be less than significant.

7 ***c) Result in a change in air traffic patterns, including either an increase in traffic***
8 ***levels or a change in location that results in substantial safety risks?***

9 **No Impact.** The Project is an underground pipeline replacement project located in a
10 remote location of Solano County and would have no effect on air traffic; therefore,
11 there would be no impact.

12 ***d) Substantially increase hazards due to a design feature (e.g., sharp curves or***
13 ***dangerous intersections) or incompatible uses (e.g., farm equipment)?***

14 **Less Than Significant Impact.** The Project is an underground pipeline replacement
15 project located in a remote part of Solano County. Although the surface of
16 approximately 3,000 linear feet of non-public levee roads would be improved, no new
17 roads would be constructed. Additionally, Grizzly Island Road, which is accessible to
18 recreational users, would be used to transport equipment to and from the North Work
19 Area. Speeds on the road are low, particularly on unpaved portions, and while
20 recreational users may experience some delays during equipment transport, the
21 transport of the equipment is not expected to create a significant hazard. Therefore, the
22 impact would be less than significant.

23 ***e) Result in inadequate emergency access?***

24 **No Impact.** As discussed above, the Project would generate minimal additional traffic
25 and would not require any road closures, including closures that would result in
26 inadequate emergency access; therefore, there would be no impact.

27 ***f) Conflict with adopted policies, plans, or programs regarding public transit,***
28 ***bicycle, or pedestrian facilities, or otherwise decrease the performance or***
29 ***safety of such facilities?***

30 **No Impact.** The Project location is in a remote area mostly on private lands where
31 public transit, bicycle, and pedestrian facilities do not exist and are not planned;
32 therefore, there would be no impact.

33 **3.16.4 Mitigation Summary**

34 The Project would not result in significant impacts to Transportation/Traffic; therefore,
35 no mitigation is required.

1 **3.17 UTILITIES AND SERVICE SYSTEMS**

UTILITIES AND SERVICE SYSTEMS – Would the Project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Have sufficient water supplies available to serve the Project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

2 **3.17.1 Environmental Setting**

3 The Project is located within Suisun Marsh, north of Honker Bay, in Solano County and
 4 extends into Honker Bay approximately 7,000 feet from the shore (Figure 1-1). The
 5 Project is a short-term pipeline replacement project that would not result in the
 6 construction of new utility or service systems, nor create a new demand for permanent
 7 utilities or service systems. The Project area would be returned to pre-Project conditions
 8 following construction. With respect to utilities and service systems, the primary needs
 9 of the Project include the ability to recycle or dispose of hazardous and non-hazardous
 10 waste and wastewater.

11 Project actions including HDD and hydrostatic testing would have the potential to
 12 generate non-hazardous wastewater, as well as hazardous and non-hazardous solid

1 waste. Potential hazardous waste associated with Project components are discussed in
2 Section 3.8, Hazards and Hazardous Materials.

3 Solano County contracts solid waste management services with various contractors
4 serving unincorporated communities. The closest landfill to the Project site is the
5 Potrero Hills Landfill located in Suisun City, which is estimated to reach capacity in
6 December 2045 (California Department of Resources Recycling and Recovery
7 [CalRecycle] 2016a). Another landfill close to the Project area is Keller Canyon Landfill
8 in Pittsburg, which has projected capacity until 2050 (CalRecycle 2016b). In addition,
9 Altamont Landfill in Livermore has capacity through 2045 (Waste Management 2016).

10 Disposal of wastewater used for the hydrostatic testing portion of the Project may
11 require transit to a local wastewater treatment facility. The closest wastewater treatment
12 facility is the Rio Vista Northwest Wastewater Treatment Facility in Rio Vista. Drilling
13 mud waste would also require disposal. The closest drilling mud waste disposal facility
14 is the Aqua Clear Farms Facility located in Solano County. The estimated remaining
15 disposal capacity at Aqua Clear Farms is approximately 312,000 cubic yards; the facility
16 has applied to expand its disposal capacity to twice that amount (Tingey 2016).

17 **3.17.2 Regulatory Setting**

18 No federal, state, or local laws relevant to this issue area are applicable to the Project.

19 **3.17.3 Impact Analysis**

20 ***a) Exceed wastewater treatment requirements of the applicable Regional Water*** 21 ***Quality Control Board?***

22 **Less than Significant Impact.** The only wastewater generated by the Project that
23 would potentially require treatment would be approximately 15,000 gallons of
24 hydrostatic testing water. Hydrostatic testing could introduce conventional construction
25 contaminants into the water such as oil and greases. Once the hydrostatic testing is
26 complete, the water would be transferred to water storage tanks and tested. If a permit
27 cannot be obtained to discharge the hydrostatic test water to surrounding waters (in
28 accordance with the Statewide General Construction Permit for Stormwater Discharges
29 Associated with Construction Activity) or to land (in accordance with the SWRCB's
30 NPDES Construction General Permit for below-threat water quality discharges to land),
31 the water would be hauled off site for disposal at a permitted commercial disposal
32 facility, such as a wastewater treatment plant. Residual construction contaminants such
33 as oil and greases would be removed at the wastewater treatment plant through
34 conventional secondary treatment processes. No new contaminants would be
35 introduced into the bay nor would the Project exceed any RWQCB wastewater
36 treatment requirements. Therefore, the impact would be less than significant.

1 ***b) Require or result in the construction of new water or wastewater treatment***
2 ***facilities or expansion of existing facilities, the construction of which could***
3 ***cause significant environmental effects?***

4 **No Impact.** The only wastewater generated by the Project that would potentially require
5 treatment would be the hydrostatic testing water (approximately 15,000 gallons). If the
6 wastewater is sent to a wastewater treatment facility, the closest facility is the Rio Vista
7 Northwest Wastewater Treatment Facility. This facility has a design daily average flow
8 capacity of 1 million gallons per day (SFBRWQCB 2010). The minor amount of
9 wastewater generated by the Project would not exceed the capacity of this treatment
10 facility. No new wastewater treatment facilities are proposed or expected based on the
11 volume of wastewater to be generated by this Project. Therefore, there would be no
12 impact.

13 ***c) Require or result in the construction of new stormwater drainage facilities or***
14 ***expansion of existing facilities, the construction of which could cause***
15 ***significant environmental effects?***

16 **No Impact.** The Project area does not drain into any municipal stormwater drainage
17 system, would not create or contribute stormwater exceeding the capacity of existing or
18 planned stormwater drainage systems, and would not provide substantial additional
19 sources of stormwater to such systems. No new stormwater facilities are proposed or
20 expected to be required for this Project. Therefore, there would be no impact.

21 ***d) Have sufficient water supplies available to serve the Project from existing***
22 ***entitlements and resources, or are new or expanded entitlements needed?***

23 **Less than Significant Impact.** Water for the Project would be obtained from the City of
24 Fairfield for Project construction needs. The Project would use approximately 21,000
25 gallons of water per day, or approximately 800,000 gallons total. No new or expanded
26 water entitlements would be needed. Therefore, there would be no impact.

27 ***e) Result in a determination by the wastewater treatment provider which serves***
28 ***or may serve the Project that it has adequate capacity to serve the Project's***
29 ***projected demand in addition to the provider's existing commitments?***

30 **Less than Significant Impact.** The only wastewater generated by the Project that
31 could require treatment would be hydrostatic testing water (approximately 15,000
32 gallons). If the wastewater is sent to a wastewater treatment facility the closest facility is
33 the Rio Vista Northwest Wastewater Treatment Facility. This facility has a design daily
34 average flow capacity of 1 million gallons per day. The minor amount of wastewater
35 generated by the Project would not exceed the capacity of this treatment facility.
36 Therefore, this impact would be less than significant.

1 ***f) Be served by a landfill with sufficient permitted capacity to accommodate the***
2 ***Project's solid waste disposal needs?***

3 **Less than Significant Impact.** Much of the construction materials used for the Project
4 (e.g., piles, rock, interlocking mats) would be recycled/reused by the contractor. Project-
5 generated solid waste that would require disposal could be disposed of at the Potrero
6 Hills Landfill or the Keller Canyon Landfill, both of which have sufficient capacity to
7 accept the Project's small volume of solid waste. Additionally, the Project would
8 generate approximately 31 cubic yards of drilling mud requiring disposal. The Aqua
9 Clear Farms Facility has ample disposal capacity to meet the Project's drilling mud
10 disposal needs. Therefore, this impact would be less than significant.

11 ***g) Comply with federal, state, and local statutes and regulations related to solid***
12 ***waste?***

13 **No Impact.** All solid waste generated by the Project would be disposed of in
14 accordance with all federal, state, and local statutes and regulations related to solid
15 waste. Therefore, there would be no impact.

16 **3.17.4 Mitigation Summary**

17 The Project would not result in significant impacts to Utilities and Service Systems;
18 therefore, no mitigation is required.

1 **3.18 MANDATORY FINDINGS OF SIGNIFICANCE**

2 The lead agency shall find that a project may have a significant effect on the
 3 environment and thereby require an EIR to be prepared for the project where there is
 4 substantial evidence, in light of the whole record, that any of the following conditions
 5 may occur.

6 Where prior to commencement of the environmental analysis a project proponent agrees
 7 to MMs or project modifications that would avoid any significant effect on the
 8 environment or would mitigate the significant environmental effect, a lead agency
 9 need not prepare an EIR solely because without mitigation the environmental effects
 10 would have been significant (per State CEQA Guidelines, § 15065).

MANDATORY FINDINGS OF SIGNIFICANCE	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Does the Project have the potential to 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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Does the Project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of past, present and probable future projects)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Does the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

1 **Less than Significant with Mitigation.** As described in Section 3.4, Biological
2 Resources, the Project would not significantly adversely affect fish or wildlife habitat,
3 cause a fish or wildlife population to drop below self-sustaining levels, threaten to
4 eliminate a plant or animal community, or reduce the number or restrict the range of an
5 endangered, rare, or threatened species. With the implementation of **MM BIO-1** through
6 **MM BIO-9** and construction BMPs, the minor, brief, and localized impacts to special-
7 status species and their habitats would be less than significant.

8 The Project's potential effects on historic and archaeological resources are described in
9 Section 3.5, Cultural Resources; no resources are known to be present within the
10 Project footprint. This finding was based upon a cultural resources records review of the
11 Project area. The only ground disturbance during Project activities would occur in the
12 North Work Area and upper layers of bay sediment near the South Work Area.
13 Implementation of **MM CUL-1** through **MM CUL-3** would reduce the potential for
14 Project-related impacts to cultural and paleontological resources to less than significant.

15 ***b) Does the Project have impacts that are individually limited, but cumulatively***
16 ***considerable? (“Cumulatively considerable” means that the incremental***
17 ***effects of a project are significant when viewed in connection with the effects***
18 ***of past projects, the effects of other current projects, and the effects of past,***
19 ***present and probable future projects)?***

20 **Less than Significant with Mitigation.** Past, current, and reasonably foreseeable
21 projects within the vicinity of the proposed Project are:

- 22 • A CPL Pipeline Integrity Management Repair on the BAPL in Mallard Farms,
23 which would occur over a 45-day period in 2016 and be completed prior to
24 Project initiation; and
- 25 • The Honker Bay Conservation Bank Fish Habitat Restoration Project, which
26 seeks to preserve, enhance, and restore habitat beneficial to Bay-Delta native
27 fish species (including Chinook salmon, steelhead, longfin smelt, delta smelt, and
28 southern green sturgeon) in southern Suisun Marsh in order to provide
29 compensatory mitigation for approved projects affecting special-status fish
30 species within the region.

31 As provided in this MND, the Project has the potential to significantly impact the following
32 environmental disciplines: Aesthetics, Biological Resources, Cultural and
33 Paleontological Resources, Hazards and Hazardous Materials, Hydrology and Water
34 Quality, and Land Use and Planning. However, measures have been identified that
35 would reduce these impacts to a level of less than significant. For any impacts to act
36 cumulatively on any past, present, or reasonably foreseeable projects, these projects
37 would have to have individual impacts in the same resource areas, some at the same
38 time, or occur within an overlapping area as the proposed Project. Because the potential

1 impacts of the proposed Project could be exacerbated by other projects, the potential
2 for cumulative impacts are described below.

3 Aesthetics. The cumulative impacts study area for aesthetics includes the Project area
4 and nearby vicinity. Although the proposed Project would be located within the same
5 publicly accessible viewshed as the 2016 BAPL repair project and Honker Bay
6 Conservation Bank Fish Habitat Restoration Project, the projects would be temporary
7 and would not overlap in time with the proposed Project. Therefore, the contribution of
8 the proposed Project to potential cumulative aesthetic impacts in the study area would
9 be less than significant.

10 Agriculture and Forestry Resources. The cumulative impacts study area for agriculture
11 and forest resources includes the Project area and nearby vicinity. The Project area
12 does not contain any agriculture or forested lands and would not convert any lands from
13 their existing land uses. Because the proposed Project would not impact agricultural
14 and forestry resources in the Project area, the proposed Project would not contribute to
15 a potential cumulative agricultural and forestry services impact in the study area.

16 Air Quality. The cumulative impacts study area for air quality includes the SFBAAB,
17 which is identical to the boundaries of the BAAQMD. As described in Section 3.3, Air
18 Quality, the proposed Project's emissions would not exceed the BAAQMD CEQA
19 significance thresholds. Therefore, pursuant to the BAAQMD CEQA Guidelines, the
20 Project would not be cumulatively considerable, and would result in a less than
21 significant cumulative impact.

22 Biological Resources. The cumulative impacts study area for biological resources
23 includes the Project area and nearby vicinity, which include similar biological resources.
24 Because the proposed Project overlaps geographically with the projects described
25 above, there could be significant cumulative impacts to biological resources, including
26 special-status species, migratory birds, and wetlands. However, the implementation of
27 **MM BIO-1** through **MM BIO-9** and **MM HWQ-1** would reduce the Project's impacts to
28 biological resources to less than significant and would further mitigate the Project's
29 contribution to cumulative impacts on these resources. The Honker Bay Conservation
30 Bank Fish Habitat Restoration Project contains MMs to reduce project impacts to
31 biological resources to less than significant, and it's reasonable to assume that the 2016
32 BAPL repair project will contain similar measures. As a result, a significant cumulative
33 impact to biological resources is unlikely to occur. Therefore, with the implementation of
34 the above mentioned MMs, the Project's contribution to potential cumulative impacts to
35 biological resources would be less than significant.

36 Cultural and Paleontological Resources. The cumulative impacts study area for cultural
37 and paleontological resources includes the Project area and nearby vicinity, which may
38 contain cultural and paleontological resources. Because the proposed Project overlaps

1 geographically with the projects described above, there could be significant cumulative
2 impacts to cultural and paleontological resources. However, the implementation of **MM**
3 **CUL-1** through **MM CUL-3** would reduce the Project's impacts to cultural and
4 paleontological resources to less than significant and further mitigate the Project's
5 contribution to cumulative impacts on these resources. Therefore, the Project's
6 contribution to potential cumulative impacts to cultural and paleontological resources
7 would be less than significant.

8 Geology and Soils. The cumulative impacts study area for geology and soils is limited to
9 the Project area as the potential for hazards related to seismically induced ground
10 failure, erosion or loss of topsoil, soil subsidence, collapsible soils, and expansive soils
11 are based on local site-specific and geologic conditions. Because the 2016 BAPL repair
12 project would occur within the limits of the proposed Project area, there could be
13 significant cumulative impacts associated with geology and soils. However, neither
14 project would result in an impact associated with exposing people or structures to
15 potential substantial adverse effects, including the risk of loss, injury, or death involving
16 rupture of a known earthquake fault or landslides, nor are they located in an area of
17 expansive soils. All other Project-related geology impacts would be less than significant.
18 As both projects would comply with all applicable laws and regulations that would
19 reduce project-level impacts to less than significant, the proposed Project's contribution
20 to potential cumulative impacts associated with geology and soils would be less than
21 significant.

22 Greenhouse Gas Emissions. The cumulative impacts study area for GHG emissions
23 includes the SFBAAB, which is identical to the boundaries of the BAAQMD. Because
24 temporary construction emissions would not exceed the threshold of significance, GHGs
25 from construction activities, emitted either directly or indirectly by the Project, would not
26 have a significant impact on the environment and would not substantially contribute to
27 global GHG emissions. Therefore, the potential cumulative GHG impacts in the study
28 area are considered less than significant.

29 Hazards and Hazardous Materials. The cumulative impacts study area for hazards and
30 hazardous materials is primarily restricted to the Project area and immediate vicinity.
31 The Project would involve the routine transport, storage, use, and disposal of hazardous
32 materials such as construction equipment fuels and lubricants, hydraulic fluid, and
33 solvents used during temporary construction activities. The storage and handling of
34 these materials during this Project would be managed in accordance with applicable
35 laws and regulations. Additionally, the implementation of **MM HAZ-1** through **MM HAZ-4**
36 would reduce the Project's impacts associated with hazards and hazardous materials to
37 less than significant and further mitigate the Project's contribution to cumulative impacts
38 on these resources. Therefore, the Project's contribution to potential cumulative impacts
39 associated with hazards and hazardous materials would be less than significant.

1 Hydrology and Water Quality. The cumulative impacts study area includes the Project
2 area and immediate vicinity. The proposed Project requires temporary in-water work
3 with heavy equipment that has the potential to create excess turbidity or release
4 chemicals into the bay. Additionally, the inadvertent return of drill mud during HDD could
5 impact water quality. However, the implementation of **MM HWQ-1** through **MM HWQ-3**
6 would reduce the Project's impacts to hydrology and water quality to less than
7 significant. The proposed Project, along with other projects occurring in the area, would
8 also be required to comply with applicable federal, state, and local water quality
9 regulations. However, the proposed Project's contribution to cumulative hydrology and
10 water quality impacts would not be cumulatively considerable for a number of reasons.
11 With the implementation of **MM HWQ-1** through **MM HWQ-3**, the proposed Project
12 would not: violate water quality standards or waste discharge requirements;
13 substantially alter existing drainage patterns; and contribute runoff that would exceed
14 drainage capacities. Further, Project construction would be of short duration, and
15 comply with construction water quality BMPs required under the Construction General
16 Permit. As a result, neither the proposed Project nor the projects described above would
17 contribute to a cumulative hydrology or water quality impact. For these reasons, the
18 Project's contribution to any cumulative impact on hydrology and water quality would not
19 be cumulatively considerable.

20 Land Use and Planning. The cumulative impacts study area for land use and planning
21 includes the Project area and immediate vicinity, which generally includes undeveloped
22 marsh lands and the waters of Honker Bay. The proposed Project includes the
23 replacement of the existing aged pipeline with a new pipe segment via HDD that would
24 decrease the likelihood of future leaks and eliminate the need for several separate
25 repairs using open trenching in the marsh, which would result in greater impacts to the
26 marsh. However, with the implementation of **MM BIO-1** through **MM BIO-8** and
27 compliance with any conditions required by other agencies with jurisdiction over the
28 proposed Project, potential impacts to land use and planning would be reduced to less
29 than significant. However, the proposed Project's contribution to cumulative land use
30 and planning impacts would not be cumulatively considerable as the proposed Project is
31 consistent with applicable land use designations and policies. Further, the Applicant
32 would have to obtain additional required permits/approvals, as listed in Section 1.7,
33 Approvals and Regulatory Requirements, prior to the start of construction. As a result,
34 neither the proposed Project nor the projects described above would contribute to a
35 cumulative land use and planning impact associated with a change in the character of
36 the existing project vicinity nor would they change existing uses in the area. For these
37 reasons, the Project's contribution to any cumulative impact on land use and planning
38 would not be cumulatively considerable.

39 Mineral Resources. The cumulative impacts study area for mineral resources includes
40 the Project area and immediate vicinity. The Project area consists of undeveloped
41 marshes, and no known mineral resources are located within or near the Project area.

1 Because the Project would not impact mineral resources within the study area, the
2 Project would not contribute to a potential cumulative mineral resources impact in the
3 study area.

4 Noise. The cumulative impacts study area for noise includes the Project area, its
5 immediate vicinity, and areas next to proposed haul routes. Although the proposed
6 Project overlaps geographically with the 2016 BAPL repair project and the Honker Bay
7 Conservation Bank Fish Habitat Restoration Project, these projects would be temporary
8 and would not overlap in time with the proposed Project. Therefore, the contribution of
9 the proposed Project to potential cumulative noise impacts in the study area would be
10 less than significant.

11 Population and Housing. The cumulative impacts study area for population and housing
12 includes the Project area and nearby vicinity. The proposed Project is short-term and
13 would not induce population growth nor displace housing or people. Additionally, the
14 short-term employment opportunities created by the proposed Project would be for
15 persons with specialized skills that are expected to come from the Project region.
16 Because the Project would not impact population and housing within the study area, the
17 Project would not contribute to a potential cumulative population and housing impact in
18 the study area.

19 Public Services. The cumulative impacts study area for population and housing includes
20 the Project area and nearby vicinity. The proposed Project would maintain the existing
21 site use and character and would not induce population growth or activity such that
22 additional public services would be needed. Because the proposed Project would not
23 impact public services within the study area, the proposed Project would not contribute
24 to a potential cumulative public services impact in the study area.

25 Recreation. The cumulative impacts study area for recreation includes the Project area
26 and nearby vicinity. The Project would not increase the use of existing parks and
27 recreational facilities and does not include or require recreational facilities. Because the
28 proposed Project would not impact recreational facilities within the study area, the
29 proposed Project would not contribute to a potential cumulative recreation impact in the
30 study area.

31 Transportation/Traffic. The cumulative impacts study area for transportation and traffic
32 includes the local and regional roadways that would be used for construction-related
33 vehicles to access the Project area. These roadways include SR 12 through Fairfield
34 and Suisun City and Grizzly Island Road. Although the proposed Project overlaps
35 geographically with the 2016 BAPL repair project and the Honker Bay Conservation
36 Bank Fish Habitat Restoration Project, these projects would be temporary and would
37 not overlap in time with the proposed Project. Therefore, the contribution of the

1 proposed Project to potential cumulative transportation and traffic impacts in the study
2 area would be less than significant.

3 Utilities and Service Systems. The cumulative impacts study area for utilities and
4 service systems includes the Project area, nearby vicinity, and the service areas of
5 regional service/utility providers. The proposed Project and the projects described
6 above would not result in any new utilities demands and would not need utilities or
7 service systems except for a small amount of construction solid waste disposal and a
8 minor amount of wastewater. The landfills and wastewater treatment provider in the
9 vicinity have ample capacity to meet the proposed Project needs as well as the need of
10 the 2016 BAPL repair project and the Honker Bay Conservation Bank Fish Habitat
11 Restoration Project. Therefore, the contribution of the proposed Project to potential
12 cumulative utilities and service systems impacts in the study area would be less than
13 significant.

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

16 **Less than Significant with Mitigation.** The Project's potential to impact human beings
17 is addressed in various sections of this document, including those that affect resources
18 used or enjoyed by the public, residents, and others in the Project area (such as
19 aesthetics, public services, and recreation); those that are protective of public safety
20 and well-being (such as air quality, geology and soils, GHG emissions, hydrology and
21 water quality, and noise); and those that address community character and essential
22 infrastructure (such as land use and planning, population and housing, transportation,
23 and utilities). None of these analyses identified a potential adverse effect on human
24 beings that could not be avoided or minimized through the MMs described or
25 compliance with standard regulatory requirements. As such, with mitigation in place,
26 project impacts to human beings would be less than significant.

4.0 OTHER MAJOR AREAS OF CONCERN

4.1 CSLC ENVIRONMENTAL JUSTICE POLICY

Environmental justice is defined by California law as “the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies” (Senate Bill 115 [Stats. 1999, ch. 690]). This definition is consistent with the Public Trust Doctrine principle that the management of trust lands is for the benefit of all of the people. The California State Lands Commission (CSLC) adopted an environmental justice policy in October 2002 to ensure that environmental justice is an essential consideration in the agency’s processes, decisions, and programs. Through its policy, CSLC reaffirms its commitment to an informed and open process in which all people are treated equitably and with dignity, and in which its decisions are tempered by environmental justice considerations. As part of its environmental justice policy, the CSLC pledges to continue and enhance its processes, decisions, and programs with environmental justice as an essential consideration by:

- Identifying relevant populations that might be adversely affected by CSLC programs or by projects submitted by outside parties for its consideration.
- Seeking out community groups and leaders to encourage communication and collaboration with the CSLC and its staff.
- Distributing public information as broadly as possible and in multiple languages, as needed, to encourage participation in the CSLC’s public processes.
- Incorporating consultations with affected community groups and leaders while preparing environmental analyses of projects submitted to the CSLC for its consideration.
- Ensuring that public documents and notices relating to human health or environmental issues are concise, understandable, and readily accessible to the public, in multiple languages, as needed.
- Holding public meetings, public hearings, and public workshops at times and in locations that encourage meaningful public involvement by members of the affected communities.
- Educating present and future generations in all walks of life about public access to lands and resources managed by the CSLC.
- Ensuring that a range of reasonable alternatives is identified when siting facilities that may adversely affect relevant populations and identifying, for the CSLC’s consideration, those that would minimize or eliminate environmental impacts affecting such populations.

- 1 • Working in conjunction with federal, state, regional, and local agencies to ensure
2 consideration of disproportionate impacts on relevant populations, by instant or
3 cumulative environmental pollution or degradation.
- 4 • Fostering research and data collection to better define cumulative sources of
5 pollution, exposures, risks, and impacts.
- 6 • Providing appropriate training on environmental justice issues to staff and the
7 CSLC so that recognition and consideration of such issues are incorporated into
8 its daily activities.
- 9 • Reporting periodically to the CSLC on how environmental justice is a part of the
10 programs, processes, and activities conducted by the CSLC and by proposing
11 modifications as necessary.

12 **4.1.1 Methodology**

13 The CSLC does not specify a methodology for conducting programmatic-level analysis
14 of environmental justice issues. This analysis focuses primarily on whether the Project's
15 impacts may affect areas of high minority populations and/or low-income communities
16 disproportionately and thus would create an adverse environmental justice effect. For
17 the purpose of the environmental analysis, the Project's inconsistency with the CSLC's
18 environmental justice policy would occur if the Project would:

- 19 • Have the potential to disproportionately affect minority and/or low-income
20 populations adversely; or
- 21 • Result in a substantial, disproportionate decrease in employment and economic
22 base of minority and/or low-income populations residing in immediately adjacent
23 communities.

24 **4.1.2 Project Analysis**

25 The Project's limited impact on the human environment is established in various
26 sections of this document, including Sections 3.1, Aesthetics; 3.3, Air Quality; 3.7,
27 Greenhouse Gas Emissions; 3.8, Hazards and Hazardous Materials; 3.9, Hydrology
28 and Water Resources; 3.12, Noise; 3.15, Recreation; and 3.16, Traffic/Transportation.
29 The Project would be located in Suisun Marsh and Honker Bay, adjacent to open space
30 and approximately 3.5 miles from the closest residents. Project construction activities
31 would be limited to a 3-month period, and the only potential effects to local residents,
32 which include noise, hazardous materials, and air quality would be less than significant.
33 The Project would have minor positive employment impacts, with approximately 60 new
34 workers from the local workforce distributed between the North and South Work Areas
35 over a 3-month construction period. Therefore, the Project would not adversely affect
36 any populations, including minority or low-income populations.

5.0 MITIGATION MONITORING PROGRAM

The California State Lands Commission (CSLC) is the lead agency under the California Environmental Quality Act (CEQA) for the Mallard Farms Pipeline Replacement Project. In conjunction with approval of this Project, the CSLC adopts this Mitigation Monitoring Program (MMP) for implementation of mitigation measures (MMs) for the Project to comply with Public Resources Code section 21081.6, subdivision (a) and State CEQA Guidelines sections 15091, subdivision (d) and 15097.

The Project authorizes Chevron Pipe Line Company (Applicant) to replace an approximately 1.2-mile segment of the Bay Area Products Line pipeline that runs from Pittsburg to Sacramento through Mallard Farms using horizontal directional drilling.

5.1 PURPOSE

It is important that significant impacts from the Project are mitigated to the maximum extent feasible. The purpose of a MMP is to ensure compliance and implementation of MMs; this MMP shall be used as a working guide for implementation, monitoring, and reporting for the Project's MMs.

5.2 ENFORCEMENT AND COMPLIANCE

The CSLC is responsible for enforcing this MMP. The Project Applicant is responsible for the successful implementation of and compliance with the MMs identified in this MMP. This includes all field personnel and contractors working for the Applicant.

5.3 MONITORING

The CSLC staff may delegate duties and responsibilities for monitoring to other environmental monitors or consultants as necessary. Some monitoring responsibilities may be assumed by other agencies, such as affected jurisdictions, cities, and/or the California Department of Fish and Wildlife. The CSLC and/or its designee shall ensure that qualified environmental monitors are assigned to the Project.

Environmental Monitors. To ensure implementation and success of the MMs, an environmental monitor must be on-site during all Project activities that have the potential to create significant environmental impacts or impacts for which mitigation is required. Along with the CSLC staff, the environmental monitor(s) are responsible for:

- Ensuring that the Applicant has obtained all applicable agency reviews and approvals;
- Coordinating with the Applicant to integrate the mitigation monitoring procedures during Project implementation; and

- 1 • Ensuring that the MMP is followed.

2 The environmental monitor shall immediately report any deviation from the procedures
3 identified in this MMP to the CSLC staff or its designee. The CSLC staff or its designee
4 shall approve any deviation and its correction.

5 **Workforce Personnel.** Implementation of the MMP requires the full cooperation of
6 Project personnel and supervisors. Many of the MMs require action from site
7 supervisors and their crews. The following actions shall be taken to ensure successful
8 implementation.

- 9 • Relevant mitigation procedures shall be written into contracts between the
10 Applicant and any contractors.

11 **General Reporting Procedures.** A monitoring record form shall be submitted to the
12 Applicant, and once the Project is complete, a compilation of all the logs shall be
13 submitted to the CSLC staff. The CSLC staff or its designated environmental monitor
14 shall develop a checklist to track all procedures required for each MM and shall ensure
15 that the timing specified for the procedures is followed. The environmental monitor shall
16 note any issues that may occur and take appropriate action to resolve them.

17 **Public Access to Records.** Records and reports are open to the public and would be
18 provided upon request.

19 **5.4 MITIGATION MONITORING TABLE**

20 This section presents the mitigation monitoring table (Table 5-1) for the following
21 environmental disciplines: Aesthetics, Biological Resources, Cultural Resources,
22 Hazards and Hazardous Materials, Hydrology and Water Quality, and Land Use and
23 Planning. All other environmental disciplines were found to have less than significant or
24 no impacts and are, therefore, not included below. The table lists the following
25 information by column:

- 26 • Potential Impact;
27 • Mitigation Measure (full text of the measure);
28 • Location (where impact occurs and MM should be applied);
29 • Monitoring/Reporting Action (action to be taken by monitor or Lead Agency);
30 • Timing (before, during, or after construction; during operation, etc.);
31 • Responsible Party; and
32 • Effectiveness Criteria (how the agency can know if the measure is effective).

Table 5-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring/Reporting Action	Timing	Responsible Party	Effectiveness Criteria
<i>Aesthetics</i>						
Create a new source of substantial light or glare	MM AES-1: Night-Lighting Spillage Minimization. Night-lighting required during pipe pullback activity shall be shielded and directed downward toward the work area to minimize light trespass to adjacent areas.	North and South Work Areas	Observe nighttime lighting positioning for compliance	Throughout construction	Applicant and CSLC	Off-site light spillage minimized
<i>Biological Resources</i>						
Special-status species and habitat	MM BIO-1: Environmental Awareness Training. Chevron Pipe Line Company (CPL) shall ensure that all construction personnel receive mandatory environmental awareness training. The training shall be provided by a qualified biologist, approved by California State Lands Commission (CSLC) staff, prior to start of construction activities, and as new personnel are added to the Project. The environmental awareness training shall familiarize workers with the special-status species and their habitats, explain the regulatory requirements to protect special-status species, and describe measures that must be implemented to avoid and minimize impacts (including observing posted speed limits and maintaining a 15-mile-per-hour limit on unpaved roads). The training materials shall be developed and submitted to CSLC staff for approval at least 3 weeks prior to start of Project activities. CPL shall identify a representative as the person for any employee or contractor to contact if a special-status species is observed, and shall provide the contact information for both this representative and the qualified biologist to U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, and CSLC staffs before construction commences. The qualified biologist shall maintain a list of contractors who have received training and shall submit a summary of the awareness training to CSLC staff within 30 days after construction begins and after construction is completed.	N/A	Document training	Prior to construction	Applicant and CSLC	Educate workers on the potential for special-status species and their habitats, explain the regulatory requirements to protect special-status species, and describe measures that must be implemented to avoid and minimize impacts

Table 5-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring/Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	<p>MM BIO-2: Biological Monitoring and Surveying. Chevron Pipe Line Company (CPL) shall ensure that the following surveys and/or monitoring activities are conducted. Surveys shall be conducted by a qualified biologist, approved by California State Lands Commission (CSLC) staff in consultation with California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), or National Marine Fisheries Service (NMFS) staffs.</p> <ul style="list-style-type: none"> • <u>Pre-Construction Surveys</u>: A pre-construction survey shall be conducted within 15 days prior to the start of construction at the North Work Area and staging areas to ensure that no sensitive species are present. • <u>Plant Surveys</u>: Rare plant surveys shall be conducted during the appropriate blooming period. If any rare plants are identified, they shall be flagged or fenced for avoidance. • <u>Biological Monitoring during Construction</u>: An approved qualified biologist shall be on-site during all ground-disturbance activities at the North Work Area. The biologist shall survey the work area before the start of ground breaking activities each day. The biologist shall have the authority to stop activities in the event that a special-status species is observed. In the event that a special-status species is encountered in the Project area during Project activities, associated work activities at the location shall be halted immediately and CPL shall contact the appropriate agency (i.e., CDFW, USFWS, NMFS) and CSLC staff to discuss ways to proceed with the Project. Monitoring results shall be summarized in a monthly report and provided to CSLC staff during construction. • <u>Migratory Bird Monitoring and Protection Measures</u>: 	North Work Area	Obtain monitoring results summarized in monthly reports provided to CSLC staff during construction	Pre-construction and throughout construction	Applicant and CSLC	Sensitive species avoided and/or protected throughout construction

Table 5-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring/Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	<p>For work conducted within the migratory bird breeding season (February 15 and August 31), the approved qualified biologist shall complete nesting bird surveys within 15 days prior to Project implementation to determine if migratory birds protected under the Migratory Bird Treaty Act (MBTA) are nesting in the Project area. Nest surveys shall follow standard biological survey methods, and shall be tailored to detect specific species, with visits planned at appropriate time frames/intervals to detect nesting activity. If nests are found, the Project biologist shall establish an appropriate buffer to be in compliance with the MBTA. To prevent encroachment, the established buffer(s) shall be clearly marked for avoidance and shall remain in effect until the young have fledged or the nest has been abandoned, as confirmed by the Project biologist.</p> <ul style="list-style-type: none"> • If active nests are identified during construction within 50 feet of the North Work Area (or other distance determined through consultation with the USFWS), a biological monitor shall conduct regular (no less than twice per week) surveys of each active nest to monitor the behavior of the nesting bird for signs of stress or potential nest failure. The nest survey must be conducted during active construction, when construction noise is present, and be of sufficient duration to make an appropriate assessment (up to 1 hour). The biological monitor shall take care to not cause nest disturbance during monitoring. Weekly reports shall be prepared summarizing the results of the monitoring, behaviors observed, and actions taken, and shall be submitted to the USFWS. If nesting birds are found to exhibit signs of stress or if potential nest failure is suspected, CPL shall obtain 					

Table 5-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring/Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	authorization from the USFWS to have the nest either relocated or removed by an approved professional. If construction activities are believed to be a direct cause of nest disturbance that may lead to nest failure, construction activities shall be temporarily halted and/or minimized until there is a resolution through one of the means discussed above, until fledging has occurred, or until resumption of construction activities is approved through consultation with the USFWS.					
	MM BIO-3: Wildlife Exclusion Fencing. The contractor shall install salt marsh harvest mouse exclusion fencing around the North Work Area under the supervision of the biological monitor. Fencing shall be installed immediately when water levels in the pond allow access to the North Work Area. Unidirectional escape routes shall be installed in the fencing to allow any animals to escape the Project area during construction activities if they are in the work area. The biological monitor shall check the fence at regular intervals to monitor proper installation and report maintenance needs and check for the presence of wildlife. Fence inspection intervals shall be based on the planned construction activities, recent and forecasted weather events, and the results of pre-construction surveys and previous fence checks.	North Work Area	Retain biological monitors' records and documentation of any subsequent maintenance activities	At initiation of construction in May	Applicant and CSLC	Wildlife excluded from Project area
Temporary habitat disturbance	MM BIO-4: Migratory Bird Avoidance. Between February 1 and February 15 (between the end of waterfowl hunting season when the North Work Area flooded and prior to the start of the migratory bird nesting season when flooding ceases), Chevron Pipe Line Company (CPL) shall initiate ground disturbance activities in the North Work Area. After a pre-activity survey (MM BIO-2), the contractor shall trim (using hand tools) the existing vegetation within the work area (as needed to facilitate the placement of filter fabric) and a	North Work Area	Obtain monitoring results summarized in monthly reports provided to CSLC staff during construction	February 1 to 15	Applicant and CSLC	Migratory birds avoided throughout construction

Table 5-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring/Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	<p>50-foot buffer around the work area, overlay filter fabric, and potentially install the first layer of base rock for the North Work Area pad. This effort during the non-breeding season, and immediately following the end of the flooding period, shall make the North Work Area unattractive to nesting birds during the nesting season (as well as salt marsh harvest mice that may be moving into the area). Bird deterrents (i.e., foil streamers, decoys, noise) shall be installed in consultation with the resources agencies to detract nesting birds from the Project area and the surrounding area. CPL shall monitor the effectiveness of the deterrents, make regular inspections of the North Work Area, and make modifications to the deterrents as necessary. At least 48 hours prior to installation of the temporary borehole tracking system (e.g., wire coil), a qualified biologist shall complete a nest survey within terrestrial environments along the Horizontal Directional Drilling alignment. Any observed nest will be marked and identified in the field. During the installation of the surface tracking system, a qualified biologist shall accompany the construction personnel to ensure identified nests are avoided along the walking path and placement of the wire. Any nest markings shall be removed by the qualified biologist during the removal of the wire coil tracking system. Monitoring results shall be summarized in a memorandum and provided to California State Lands Commission staff during construction.</p>					
	<p>MM BIO-5: North Work Area Vegetation Impact Minimization Plan. At least 2 weeks prior to the start of construction, Chevron Pipe Line Company shall submit to California State Lands Commission (CSLC) staff for approval, and shall subsequently implement, a North Work Area Vegetation Impact Minimization Plan. The Plan shall include at least the following elements.</p> <ul style="list-style-type: none"> • The North Work Area shall not be graded for 	North Work Area	Implement approved Plan	Throughout construction	Applicant and CSLC	Impacts to vegetation at the North Work Area are minimized

Table 5-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring/Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	<p>construction of the pad.</p> <ul style="list-style-type: none"> In order to preserve the roots and seedbank of plant species, vegetation shall be trimmed with hand tools to just above ground level in the work area (as needed) as well as in a 50-foot buffer, leaving rootstock in place. The trimmed material shall be left in place on the ground or stockpiled to be replaced after removal of the pad materials at the end of construction. Per MM BIO-2, pre-construction surveys and biological monitoring shall be conducted during vegetation trimming. Vegetation shall only be excavated in the drill entry and tie-in pit (maximum size 10 feet by 12 feet by 6 feet). Vegetation and soil from the excavated pit shall be salvaged and stockpiled separately to be replaced during site restoration. 					
	<p>MM BIO-6: Revegetation and Monitoring Plan. Following completion of Project construction, Chevron Pipe Line Company (CPL) shall restore the area to pre-Project conditions in accordance with a Revegetation and Monitoring Plan. At least 2 weeks prior to conclusion of construction, CPL shall submit the Plan to California State Lands Commission (CSLC) staff for approval. The Plan shall include details for site preparation and revegetation methods, monitoring, performance criteria, and reporting. These elements are subject to modification through consultation with natural resource agencies.</p> <ul style="list-style-type: none"> Site Preparation and Revegetation: All equipment, geotextile mats, rock fill, and filter fabric shall be removed. Any stockpiled native vegetation trimmings (that were trimmed at the beginning of construction) shall be reapplied over temporarily disturbed wetlands to provide temporary soil protection and as a seed source. The drill pit shall be backfilled with the 	North Work Area	Annual reports and a final monitoring report by December 31 of each monitoring year (until monitoring obligations are complete) or as determined in coordination with the natural resource	Throughout construction with monitoring occurring annually for the first 3 to 5 years following revegetation (expected to be 2018 to 2022) with a provision that cessation of monitoring may be	Applicant and CSLC with input from, the San Francisco Bay Conservation and Development Commission, California Department of Fish and Wildlife, Regional Water Quality Control Board, U.S. Army Corps	Impacts to vegetation at the North Work Area are minimized and pre-construction condition restored to agreed upon end-points

Table 5-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring/Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	<p>stockpiled material originally excavated from the pit. Subsoil shall be replaced in the pit and compacted with machinery. After proper backfilling of the subsoil, the upper 6 inches of topsoil shall be replaced and spread evenly over the pit. Topsoil shall not be mixed with subsoil or used to fill the pit. The contractor shall also apply appropriate erosion control treatment as needed to any disturbed ground prior to the end of the construction season.</p> <ul style="list-style-type: none"> Monitoring: After construction, a qualified biologist shall monitor the hydrologic conditions and the vegetation cover and composition. Monitoring shall occur annually for the first 3 to 5 years following revegetation (expected to be 2018 to 2022) with a provision that cessation of monitoring may be requested by CPL if performance criteria for year 5 is met earlier. Restored areas shall be monitored to achieve end-points as agreed upon with the agencies. Performance Criteria: Revegetation of wetlands shall be deemed successful if total plant cover is greater than 70 percent of adjacent undisturbed areas, at least 1-3 dominant species are presented, and there is no increasing trend in invasive, non-native species relative to the adjacent undisturbed areas. Performance criteria may be revised at the request and in consultation with natural resource agencies. Reporting: Annual reports and a final monitoring report shall be submitted to the CSLC staff by December 31 of each monitoring year (until CSLC monitoring obligations are complete) or as determined in coordination with natural resources agencies. At their request, copies shall also be provided to San Francisco Bay Conservation and 		agencies	requested by CPL if performance criteria for year 5 is met earlier	of Engineers, and U.S. Fish and Wildlife Service staffs	

Table 5-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring/Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	Development Commission, California Department of Fish and Wildlife, Regional Water Quality Control Board, U.S. Army Corps of Engineers, and U.S. Fish and Wildlife Service staffs.					
	MM BIO-7: Emergent Wetland Vegetation Avoidance. Installation of the temporary borehole tracking system (e.g., wire coils) shall be conducted from vessels in open water areas in a manner that avoids driving over or through emergent wetland vegetation. The biological monitor shall provide recommendations for personnel access for the installation and alignment of the tracking system around emergent wetland vegetation in a manner that reduces or minimizes impacts on emergent wetland vegetation. A biological monitor may be present on the vessel or onshore during the installation of the wire coil to point out and document avoidance of the emergent wetland vegetation. A biological monitor may be present on the vessel or onshore during the installation of the wire coil to point out and document avoidance of the emergent wetland vegetation. Monitoring results shall be summarized in a memorandum and provided to California State Lands Commission staff during construction.	Pipeline alignment	Retain biological monitors' memorandum including records and documentation of avoidance and minimization of impacts	During installation and de-mobilization of the borehole tracking system	Applicant and CSLC	Emergent wetland vegetation avoided and/or impacts minimized
Night-lighting	Implement the following measure (see below): MM AES-1: Night-lighting Spillage Minimization					
Turbidity and sedimentation	MM BIO-8: Turbidity and Sedimentation Minimization. Sediment suspension shall be minimized when removing piles. Measures to accomplish this shall include, but are not limited to, the following: <ul style="list-style-type: none"> • When practicable, piles shall be removed with a vibratory hammer. • Piles shall be removed slowly to allow sediment to slough off at, or near, the mudline. • Excess mud that may cling to the extracted piles shall not be washed into the bay. 	South Work Area	On-site monitor to verify	Throughout construction	Applicant and CSLC	Turbidity and sedimentation minimized

Table 5-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring/Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	<ul style="list-style-type: none"> Removed piles shall be placed on a barge equipped with a basin to contain attached sediment and runoff water after removal. 					
	Also implement the following measure (see below): MM HWQ-1: Stormwater Pollution Prevention Plan (SWPPP)					
Accidental spills	Implement the following measure (see below): MM HWQ-1: Stormwater Pollution Prevention Plan (SWPPP)					
Underwater noise	MM BIO-9: Pile Driving Soft-Start Technique. A soft start for vibratory drivers requires contractors to initiate the driver at a reduced energy for 15 seconds followed by a 30-second waiting period; this procedure is then repeated two additional times. A soft start for impact drivers requires contractors to provide an initial set of strikes at a reduced energy followed by a 30-second waiting period; this procedure is then repeated two additional times. A soft start shall be implemented before pile driving begins each day and any time following the cessation of pile driving for 30 minutes or longer.	South Work Area	On-site monitor to verify	During construction of temporary trestle	Applicant and CSLC	Soft-start alerts wildlife of pile driving operations prior to full implementation
Riparian habitat/other sensitive natural communities	Implement the following measures (see above and below): MM BIO-5: North Work Area Vegetation Impact Minimization Plan MM HWQ-1: Stormwater Pollution Prevention Plan (SWPPP)					
Wetlands and other waters	Implement the following measure (see above): MM BIO-7: Emergent Wetland Vegetation Avoidance					
Conflict with local policies or plans protecting biological resources	Implement the following measures (see above): MM BIO-1: Environmental Awareness Training MM BIO-2: Biological Monitoring and Surveying MM BIO-3: Wildlife Exclusion Fencing MM BIO-4: Migratory Bird Avoidance MM BIO-5: North Work Area Vegetation Impact Minimization Plan MM BIO-6: Revegetation and Monitoring Plan MM BIO-7: Emergent Wetland Vegetation Avoidance					

Table 5-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring/Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	MM BIO-8: Turbidity and Sedimentation Minimization MM BIO-9: Pile Driving Soft-Start Technique					
Conflict with an adopted or approved conservation plan	Implement the following measures (see above): MM BIO-1: Environmental Awareness Training MM BIO-2: Biological Monitoring and Surveying MM BIO-3: Wildlife Exclusion Fencing MM BIO-4: Migratory Bird Avoidance MM BIO-5: North Work Area Vegetation Impact Minimization Plan MM BIO-6: Revegetation and Monitoring Plan MM BIO-7: Emergent Wetland Vegetation Avoidance MM BIO-8: Turbidity and Sedimentation Minimization MM BIO-9: Pile Driving Soft-Start Technique					
Cultural Resources						
Disturbance of historical resources	MM CUL-1: Discovery of Previously Unknown Cultural Resources. In the event that potentially significant archaeological or tribal cultural resources are discovered any time during construction, all earth-disturbing work within 100 feet of the discovery shall be temporarily suspended or redirected until a professional archaeologist and a culturally affiliated tribal monitor, have evaluated the nature and significance of the discovery. In the event that a potentially significant archaeological or tribal cultural resource is discovered, Chevron Pipe Line Company, the California State Lands Commission (CSLC), and any local, state, or federal agency with approval or permitting authority over the Project that has requested/required such notification shall be notified within 48 hours. Impacts to previously unknown significant archaeological or tribal cultural resources shall be avoided through preservation in place if feasible. Damaging effects to tribal cultural resources shall be avoided or minimized following the measures identified in Public Resources Code section 21084.3,	North Work Area	Inform Project contractors of archaeological resource notification procedure Document any reported finds including retention of any associated archaeological reports	Throughout construction	Applicant and CSLC	Any unanticipated cultural resource finds are avoided until evaluated and mitigated

Table 5-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring/Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	subdivision (b), if feasible, unless other measures are mutually agreed to by the lead archaeologist and culturally affiliated tribal monitor that would be as or more effective. A treatment plan developed by the archaeologist and, for tribal cultural resources, the culturally affiliated tribal monitor, shall be submitted to CSLC staff for review and approval. If the lead archaeologist and the culturally affiliated tribal monitor believe that damaging effects to tribal cultural resources will be avoided or minimized, then work in the area may resume.					
Disturbance of archaeological resources	Implement the following measure (see above): MM CUL-1: Discovery of Previously Unknown Cultural Resources					
Disturbance of paleontological resources	MM CUL-2: Discovery of Previously Unknown Paleontological Resources. In the event that potentially significant paleontological resources are discovered during Project construction: (1) Chevron Pipe Line Company (CPL) shall immediately redirect or temporarily suspend all earth-disturbing work within 100 feet of the discovery until a professional paleontologist, approved by California State Lands Commission (CSLC) staff, has evaluated the nature and significance of the discovery; and (2) CPL shall immediately notify (within 48 hours) CSLC staff and any local, state, or federal agency with approval or permitting authority over the Project that has requested/required such notification. A treatment plan developed by the paleontologist shall be submitted to CSLC staff for review and approval. If the lead paleontologist believes that damaging effects to paleontological resources will be avoided or minimized, then work in the area may resume.	North Work Area	Retain paleontologist and resulting report	Throughout construction	Applicant and CSLC	Paleontological resources are avoided or appropriately mitigated (e.g., collected and curated)

Table 5-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring/Reporting Action	Timing	Responsible Party	Effectiveness Criteria
Disturbance of human remains	MM CUL-3: Unanticipated Discovery of Human Remains. If human remains are unearthed, State Health and Safety Code section 7050.5 requires that no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code section 5097.98. If the remains are determined to be of Native American descent, the coroner has 24 hours to notify the Native American Heritage Commission. Chevron Pipe Line Company and California State Lands Commission staff shall be notified immediately within 24 hours of the discovery.	North Work Area	Retain record of any finds that are investigated as possible human remains	Throughout construction	Applicant and CSLC	Any human remains encountered on the Project site are appropriately managed
Hazards and Hazardous Materials						
Release of hazardous materials into the environment	MM HAZ-1: Oil Spill Response Plan (OSRP). Chevron Pipe Line Company shall submit a Project-specific OSRP to California State Lands Commission staff 30 days prior to start of Project activities for review and approval. At a minimum, the Project-specific OSRP shall: <ul style="list-style-type: none"> Clearly identify the responsibilities of onshore and offshore contractors prior to and during an unanticipated release of oil or other hydrocarbon; List and identify the location(s) of oil spill response equipment (including booms) onshore and offshore onboard Project vessels; List response times for deployment; Require that petroleum-fueled equipment on the main deck of all vessels have drip pans or other means of collecting dripped petroleum, which shall be collected and treated with onboard equipment; Require the primary work vessel to carry on board a minimum 400 feet of sorbent boom, five bales of sorbent pads at least 18-inch by 18-inch square, and small powered boat for rapid deployment to contain 	North and South Work Areas	OSRP and daily compliance	At least 30 days prior to commencement of Project activities and throughout construction	Applicant and CSLC	Avoid or reduce potential impacts to water or soil

Table 5-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring/Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	<p>and clean up any small spill or sheen on the water surface;</p> <ul style="list-style-type: none"> • Ensure that contracts with off-site spill response companies are in place prior to start of Project activities; and • Provide for additional containment and clean-up resources as needed. 					
	<p>MM HAZ-2: Pipeline Cleaning and Containment. Prior to cutting and tie-in activities, the existing pipeline shall be pigged and flushed to remove residual petroleum products. This work would begin at a valve location in Pittsburg and continue to another valve location near Highway 113 or at Birds Landing. The water and cleaning agent used to flush the pipe shall be recovered at the valve location near Highway 113 or at Birds Landings and disposed of at an appropriate facility. Although the line will be cleaned prior to cutting for the tie-in, secondary containment shall be set up at the North and South Work Areas as a precaution to prevent the accidental release of any material that may still remain inside the pipeline.</p>	North and South Work Areas	On-site monitor to verify	Prior to tie-in activities	Applicant and CSLC	An accidental release of hazardous material is avoided or responded to appropriately
	<p>MM HAZ-3: Inadvertent Return Contingency Plan. At least 30 days before Project implementation, Chevron Pipe Line Company shall submit to California State Lands Commission staff for review and approval, and shall subsequently implement in the event of an inadvertent return, a Final Inadvertent Return Contingency Plan for Horizontal Directional Drilling. The Inadvertent Return Contingency Plan shall ensure that preventive and responsive measures can be implemented by the contractor and shall include:</p> <ul style="list-style-type: none"> • Design protocols to be implemented for the protection of sensitive cultural and biological resources; • Design protocols to require a geotechnical engineer or qualified geologist to make recommendations 	North and South Work Areas	Retain geotechnical engineer and/or qualified geologist documentation of design and drilling recommendations	At least 30 days prior to Project implementation and throughout horizontal directional drilling	Applicant and CSLC	Inadvertent returns prevented or responded to appropriately

Table 5-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring/ Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	regarding the suitability of the formations to be bored to minimize the potential for inadvertent return conditions.					
	<p>MM HAZ-4: Asbestos Handling Procedures. Construction personnel shall be informed of the potential presence of asbestos-containing material (ACM) at the construction site prior to their assignment. After exposing the existing pipeline and prior to start of cutting and tie-in activities, a certified asbestos inspector/ consultant shall test whether the coating consists of ACM greater than 1 percent by weight. If testing reveals the coating contains ACM less than 1 percent by weight, the pipe segment shall be treated as normal construction waste and no additional measures are required. If testing reveals the coating contains ACM greater than 1 percent by weight, the materials shall be abated by a certified asbestos abatement contractor in accordance with the regulations and notification requirements of the Bay Area Air Quality Management District, and in accordance with applicable worker safety regulations. All ACM removed from the pipe segment shall be labeled, transported, and disposed of at a verified and approved ACM disposal facility.</p>	North and South Work Areas	Confirm certified asbestos contractor Conduct site inspections to ensure certified personnel are conducting work	During tie-in activities	Applicant and CSLC	Asbestos-containing material appropriately handled to avoid health impacts
Hydrology and Water Quality						
Potential degradation of water quality	<p>MM HWQ-1: Stormwater Pollution Prevention Plan (SWPPP). A SWPPP consistent with the Statewide National Pollution Discharge Elimination System Construction General Permit (Order No. 2012-0006-DWQ) shall be developed and implemented. The SWPPP shall detail the construction-phase erosion and sediment control best management practices (BMPs) and the housekeeping measures for control of contaminants other than sediment. Erosion control BMPs shall include source control measures such as wetting of dry and dusty surfaces to prevent fugitive dust emissions, preservation</p>	North and South Work Areas	On-site monitor to verify	Throughout construction	Applicant and CSLC	Runoff pollutant releases and spills avoided or responded to appropriately

Table 5-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring/Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	of existing vegetation, and effective soil cover (e.g., geotextiles, straw mulch, hydroseeding) for inactive areas and finished slopes to prevent sediments from being dislodged by wind, rain, or flowing water. Sediment control BMPs shall include measures such as installation of fiber rolls and sediment basins to capture and remove particles that have already been dislodged. The SWPPP shall establish good housekeeping measures such as construction vehicle storage and maintenance, handling procedures for hazardous materials, and waste management BMPs, which shall include procedural and structural measures to prevent the release of wastes and materials used at the site. The SWPPP shall also detail spill prevention and control measures to identify the proper storage and handling techniques of fuels and lubricants, and the procedures to follow in the event of a spill.					
	<p>MM HWQ-2: Hydrostatic Test Water Disposal. Once hydrostatic testing is complete, the water shall be transferred to water storage tanks, tested, and discharged or disposed of as follows:</p> <ul style="list-style-type: none"> • If results from testing allow, the water shall either be discharged to surrounding waters in accordance with the requirements of the Statewide Construction General Permit for Stormwater Discharges Associated with Construction Activity or discharged to land in accordance with the State Water Resources Control Board's Statewide National Pollutant Discharge Elimination System General Permit (Order 2003-0003-DWQ) for below-threat water quality discharges to land. • If a permit cannot be obtained, or if testing indicates the water contains contaminants in excess of permitted levels, the water shall be hauled off site for 	North and South Work Areas	On-site monitor to verify	Before and after pipeline installation	Applicant and CSLC	Discharge of hydrostatic testing water to land or water avoided and disposed of appropriately

Table 5-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring/Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	disposal at a permitted commercial disposal facility.					
	Also implement the following measure (see above): MM BIO-8: Turbidity and Sedimentation Minimization					
Land Use and Planning						
Conflict with any applicable land use plan, policy, or regulation	Implement the following measures (see above): MM BIO-1: Environmental Awareness Training MM BIO-2: Biological Monitoring and Surveying MM BIO-3: Wildlife Exclusion Fencing MM BIO-4: Migratory Bird Avoidance MM BIO-5: North Work Area Vegetation Impact Minimization Plan MM BIO-6: Revegetation and Monitoring Plan MM BIO-7: Emergent Wetland Vegetation Avoidance MM BIO-8: Turbidity and Sedimentation Minimization MM BIO-9: Pile Driving Soft-Start Technique					

1 **6.0 MND PREPARATION SOURCES AND REFERENCES**

2 This Mitigated Negative Declaration (MND) was prepared by the staff of the California
 3 State Lands Commission’s (CSLC) Division of Environmental Planning and Management
 4 (DEPM), with the assistance of AECOM. The analysis in the MND is based on
 5 information identified, acquired, reviewed, and synthesized based on DEPM guidance
 6 and recommendations.

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APPENDIX A

Abridged List of Major Federal and State Laws, Regulations, and
Policies Potentially Applicable to the Project

Appendix A in this Mitigated Negative Declaration identifies the major **Federal and State** laws, regulations and policies (local/regional are presented in each issue area chapter) that are potentially applicable to the Project, organized by issue area in the order provided in the State California Environmental Quality Act Guidelines Appendix G (http://resources.ca.gov/ceqa/guidelines/Appendix_G.html).

Frequently Used Abbreviations (see also List of Abbreviations and Acronyms in Table of Contents)	
§	section
°C	degrees Celsius
°F	degrees Fahrenheit
AB	Assembly Bill
BCDC	San Francisco Bay Conservation and Development Commission
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CSFM	California State Fire Marshal
CSLC	California State Lands Commission
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DOT	U.S. Department of Transportation
EO	Executive Order
FERC	Federal Energy Regulatory Commission
FR	Federal Register
nm	nautical mile
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
OSPR	Office of Spill Prevention and Response (CDFW)
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SWRCB	State Water Resources Control Board
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USCG	U.S. Coast Guard
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service

MULTIPLE ENVIRONMENTAL ISSUES

Multiple Environmental Issues (Federal)	
Coastal Zone Management Act (CZMA) (42 USC 4321 et seq.)	The CZMA recognizes a national interest in coastal zone resources and in the importance of balancing competing uses of those resources, giving full consideration to aesthetic, cultural and historic, ecological, recreational, and other values as well as the needs for compatible economic development. Pursuant to the CZMA, coastal states develop and implement comprehensive coastal management programs (CMPs) that describe uses subject to the CMP, authorities and enforceable policies, and coastal zone boundaries, among other elements. The CZMA also gives state coastal management agencies regulatory control ("federal consistency" review authority) over federal activities and federally licensed, permitted or assisted activities, if the activity affects coastal resources; such activities include military projects at coastal locations and outer continental shelf oil and gas leasing, exploration and development. The CCC and BCDC coordinate California's federally approved CMPs and federal consistency reviews within their respective jurisdictions.

Multiple Environmental Issues (State)	
CEQA (Pub. Resources Code, § 21000 et seq.)	CEQA requires state and local agencies to identify significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. A public agency must comply with CEQA when it undertakes an activity defined by CEQA as a "project" that must receive some discretionary approval (i.e., the agency has authority to deny the requested permit or approval) which may cause either a direct physical change, or a reasonably foreseeable indirect change, in the environment.
CSLC and the Public Trust Doctrine	The CSLC has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways, as well as certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions (Pub. Resources Code, §§ 6301, 6306). All tidelands and submerged lands, granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the common law Public Trust. As general background, the State of California acquired sovereign ownership of all tidelands and submerged lands and beds of navigable lakes and waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of all people of the State for statewide Public Trust purposes, which include but are not limited to waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. On tidal waterways, the State's sovereign fee ownership extends landward to the mean high tide line, except for areas of fill or artificial accretion. The CSLC's jurisdiction also includes a 3-nm-wide section of tidal and submerged land adjacent to the coast and offshore islands, including bays, estuaries, and lagoons; the waters and underlying beds of more than 120 rivers, lakes, streams, and sloughs; and 1.3 million acres of "school lands" granted to the State by the Federal government to support public education. The CSLC also has leasing jurisdiction, subject to certain conditions, over mineral extraction from State property owned and managed by other State agencies (Pub. Resources Code, § 68910, subd. (b)), and is responsible for implementing a variety of State regulations for activities affecting these State Trust Lands, including implementation of CEQA.
McAteer-Petris Act (Gov. Code, § 66600 et seq.)	The McAteer-Petris Act of 1965 established the BCDC as the agency responsible for protection of San Francisco Bay's critical and sensitive shoreline areas and for implementing the McAteer-Petris Act. The Act directs BCDC to exercise its authority to issue or deny permit applications for placing fill, dredging, or changing the use of any land, water, or structure within the area of its jurisdiction (the Bay waters and 100 feet inland from the line of highest tidal action) to protect marshes, wetlands, certain other waterways and marshes, and other resources. Pursuant to the requirements of the McAteer-Petris Act, BCDC developed several plans, including the San Francisco Bay Plan, which provides the policies and maps that guide protection and the development of the bay and shoreline within BCDC's jurisdiction, and the Suisun Marsh Protection

Multiple Environmental Issues (State)	
	Plan to preserve and enhance the quality and diversity of the Suisun Marsh aquatic and wildlife habitats and to assure retention of upland areas adjacent to the Marsh in uses compatible with its protection.

AESTHETICS / VISUAL RESOURCES

Aesthetics/Visual Resources (State)	
San Francisco Bay Plan	The Bay Plan provides BCDC policies on Appearance, Design, and Scenic Views around the Bay. Several of these policies are to ensure and maintain the visual quality around the Bay.
California Scenic Highway Program (Sts. & Hy. Code, § 260 et seq.)	The purpose of California’s Scenic Highway Program, which was created by the Legislature in 1963 and is managed by Caltrans, is to preserve and protect scenic highway corridors from change which would diminish the aesthetic value of lands adjacent to highways. State highways identified as scenic, or eligible for designation, are listed in Streets and Highways Code section 260 et seq.

AGRICULTURE AND FORESTRY RESOURCES

Agriculture and Forestry Resources (State)	
Williamson Act (Gov. Code, §§ 51200-51207)	This Act enables local governments to enter into contracts with private landowners to restrict specific parcels of land to agricultural or related open space use, and provides landowners with lower property tax assessments in return. Local government planning departments are responsible for the enrollment of land into Williamson Act contracts. Generally, any commercial agricultural use would be permitted within any agricultural preserve. Local governments may also identify compatible uses permitted with a use permit.

AIR QUALITY

Air Quality (Federal)	
Federal Clean Air Act (FCAA) (42 USC 7401 et seq.)	<p>The FCAA requires the USEPA to identify National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. National standards are established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter (PM₁₀ and PM_{2.5}), and lead. The FCAA mandates that states submit and implement a State Implementation Plan (SIP) for local areas not meeting those standards; plans must include pollution control measures that demonstrate how the standards would be met. Pursuant to the 1990 FCAA amendments, the USEPA also regulates hazardous air pollutants (HAPs), which are pollutants that result in harmful health effects, but are not specifically addressed through the establishment of NAAQS. HAPs require the use of the maximum or best available control technology to limit emissions. USEPA classifies air basins (or portions thereof) as in “attainment” or “nonattainment” for each criteria air pollutant by comparing monitoring data with State and Federal standards to determine if the NAAQS are achieved. Areas are classified for a pollutant as follows:</p> <ul style="list-style-type: none"> • “Attainment” – the pollutant concentration is lower than the standard. • “Nonattainment” – the pollutant concentration exceeds the standard. • “Unclassified” – there are not enough data available for comparisons. <p>In 2007, the U.S. Supreme Court ruled that carbon dioxide (CO₂) is an air pollutant as defined under the FCAA, and that the USEPA has authority to regulate greenhouse gas emissions.</p>

Air Quality (State)	
California Clean Air Act of 1988 (CCAA) (AB 2595)	The CCAA requires all air districts in the State to endeavor to achieve and maintain State ambient air quality standards for ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, and particulate matter. CARB sets air quality standards for the State at levels to protect public health and welfare with an adequate margin of safety. The California Ambient Air Quality Standards (CAAQS) are generally stricter than national standards for the same pollutants; California also has standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. The CAAQS describe adverse conditions (i.e., pollution levels must be below these standards before a basin can attain the standard). Air quality is considered in “attainment” if pollutant levels are continuously below or equal to the standards and violate the standards no more than once each year. The 1992 CCAA Amendments divide ozone nonattainment areas into four categories of pollutant levels (moderate, serious, severe, and extreme) to which progressively more stringent requirements apply. CARB also regulates toxic air contaminants (pollutants that result in harmful health effects, but are not specifically addressed by air quality standards) through the use of air toxic control measures.
Air Toxics Hot Spots Information and Assessment Act (Health & Saf. Code, § 44300 et seq.)	The Air Toxics Hot Spots Information and Assessment Act provides for the regulation of over 200 toxic air contaminants, including diesel particulate matter. Under the act, local air districts may request that a facility account for its toxic air contaminant emissions. Local air districts then prioritize facilities on the basis of emissions, and high priority designated facilities are required to submit a health risk assessment and communicate the results to the affected public.
Other	<ul style="list-style-type: none"> • Health and Safety Code sections 25531-25543 (SB 1889) set forth changes in four areas: (1) provides guidelines to identify a more realistic health risk; (2) requires high-risk facilities to submit an air toxic emission reduction plan; (3) holds air pollution control districts accountable for ensuring that plans achieve objectives; and (4) requires high-risk facilities to achieve their planned emission reductions. • Under California’s Diesel Fuel Regulations, diesel fuel used in motor vehicles and harbor craft is limited to 15 parts per million (ppm) sulfur. • CARB’s Heavy Duty Diesel Truck Idling Rule prohibits heavy-duty diesel trucks from idling for longer than 5 minutes at a time (idling for longer than 5 minutes while queuing is allowed if the queue is located more than 100 feet of a home or school). • The Statewide Portable Equipment Registration Program (PERP) establishes a uniform program to regulate portable engines/engine-driven equipment units. Once registered in the PERP, engines and equipment units may operate throughout California without the need to obtain individual permits from local air districts.

BIOLOGICAL RESOURCES

Biological Resources (Federal)	
Federal Endangered Species Act (FESA) (7 USC 136, 16 USC 1531 et seq.)	<p>The FESA, which is administered in California by the USFWS and NMFS, provides protection to species listed as threatened or endangered, or proposed for listing as threatened or endangered. When applicants propose projects with a Federal nexus that “may affect” a federally listed or proposed species, the Federal agency must (1) consult with the USFWS or NMFS, as appropriate, under Section 7, and (2) ensure that any actions authorized, funded, or carried out by the agency are not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of areas determined to be critical habitat. Section 9 prohibits the “take” of any member of a listed species.</p> <ul style="list-style-type: none"> • Take. “To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” • Harass. “An intentional or negligent act or omission that creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt

Biological Resources (Federal)	
	<p>normal behavior patterns that include, but are not limited to, breeding, feeding, or sheltering.”</p> <ul style="list-style-type: none"> • Harm. “Significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering.”
Fish and Wildlife Coordination Act of 1958	This Act requires that whenever a body of water is proposed to be controlled or modified, the lead agency must consult the state and federal agencies responsible for fish and wildlife management (e.g., USFWS, CDFW, and NOAA). The Act allows for recommendations addressing adverse impacts associated with a proposed project, and for mitigating or compensating for impacts on fish and wildlife.
Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 USC 1801 et seq.)	The MSA governs marine fisheries management in Federal waters. The MSA was first enacted in 1976 and amended in 1996. Amendments to the 1996 MSA require the identification of Essential Fish Habitat (EFH) for federally managed species and the implementation of measures to conserve and enhance this habitat. Any project requiring Federal authorization, such as a USACE permit, is required to complete and submit an EFH Assessment with the application and either show that no significant impacts to the essential habitat of managed species are expected or identify mitigations to reduce those impacts. Under the MSA, Congress defined EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity” (16 USC 1802(10)). The EFH provisions of the MSA offer resource managers a means to heighten consideration of fish habitat in resource management. Pursuant to section 305(b)(2), federal agencies shall consult with the NMFS regarding any action they authorize, fund, or undertake that might adversely affect EFH.
Marine Mammal Protection Act (MMPA) (16 USC 1361 et seq.)	The MMPA is designed to protect and conserve marine mammals and their habitats. It prohibits takes of all marine mammals in the United States (including territorial seas) with few exceptions. The NMFS may issue a take permit under section 104 if the activities are consistent with the purposes of the MMPA and applicable regulations at 50 CFR, Part 216. The NMFS must also find that the manner of taking is “humane” as defined in the MMPA. If lethal taking of a marine mammal is requested, the applicant must demonstrate that using a non-lethal method is not feasible.
Migratory Bird Treaty Act (MBTA) (16 USC 703-712)	The MBTA was enacted to ensure the protection of shared migratory bird resources. It prohibits the take, possession, import, export, transport, selling, purchase, barter, or offering for sale, purchase, or barter, of any migratory bird, their eggs, parts, and nests, except as authorized under a valid permit (50 CFR 21.11). The USFWS issues permits for takes of migratory birds for activities such as scientific research, education, and depredation control, but does not issue permits for incidental take of migratory birds.
National Invasive Species Act (NISA) (33 CFR, Part 151, Subpart D)	NISA (originally passed in 1990 as the Nonindigenous Aquatic Nuisance Prevention and Control Act [16 USC 4701-4751] and reauthorized, renamed and expanded in 1996) is the U.S.’s chief protection against new aquatic invaders. The Act recognizes the global movement of aquatic species, particularly those that arrive in ballast water, authorized important research, and linked results of the research to decisions to the necessity of further ballast water regulation. Under its provisions, the USCG requires ballast water management (i.e., ballast water exchange) for vessels entering U.S. waters from outside the 200 nm U.S. Exclusive Economic Zone. The original Act was established to: (1) prevent unintentional introduction and dispersal of nonindigenous species into Waters of the United States through ballast water management and other requirements; (2) coordinate and disseminate information on federally conducted, funded, or authorized research, on the prevention and control of the zebra mussel and other aquatic nuisance species; (3) develop and carry out control methods to prevent, monitor, and control unintentional introductions of nonindigenous species from pathways other than ballast water exchange; (4) understand and minimize economic and ecological impacts of established nonindigenous aquatic nuisance species; and (5) establish a program of research and technology development and assistance to states in the management and removal of zebra mussels.

Biological Resources (Federal)	
Federal Executive Orders (EO)	<ul style="list-style-type: none"> • EO 11990 requires federal agencies to provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. Each agency, to the extent permitted by law, must (1) avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds there is no practical alternative to such construction or the proposed action includes all practical measures to minimize harm to wetlands that may result from such use; (2) take into account economic, environmental and other pertinent factors in making this finding; and (3) provide opportunity for early public review of any plans or proposals for new construction in wetlands. • EO 13112 requires federal agencies to use authorities to prevent introduction of invasive species, respond to and control invasions in a cost-effective and environmentally sound manner, and provide for restoration of native species and habitat conditions in invaded ecosystems. The EO establishes the Invasive Species Council, which is responsible for the preparation and issuance of the National Invasive Species Management Plan, which details and recommends performance-oriented goals and objectives and measures of success for federal agencies. • EO 13158 requires federal agencies to (1) identify actions that affect natural or cultural resources that are within an MPA; and (2) in taking such actions, to avoid harm to the natural and cultural resources that are protected by a MPA. • EO 13186 sets forth responsibilities of federal agencies to protect migratory birds.
Other	<ul style="list-style-type: none"> • CWA and Rivers and Harbors Act. (See Hydrology and Water Quality.) • CZMA. (See Multiple Environmental Issues.) • The Bald and Golden Eagle Protection Act makes it illegal to import, export, take, sell, purchase or barter any bald eagle or golden eagle or parts thereof. • The Estuary Protection Act (16 USC 1221-1226) authorizes the Secretary of the Interior to enter into cost-sharing agreements with states and subdivisions for permanent management of estuarine areas in their possession. Federal agencies must assess the impacts of commercial and industrial developments on estuaries.

Biological Resources (State)	
California Endangered Species Act (CESA) (Fish & G. Code, § 2050 et seq.)	<p>The CESA provides for the protection of rare, threatened, and endangered plants and animals, as recognized by the CDFW, and prohibits the taking of such species without its authorization. Furthermore, the CESA provides protection for those species that are designated as candidates for threatened or endangered listings. Under the CESA, the CDFW has the responsibility for maintaining a list of threatened species and endangered species (Fish & G. Code, § 2070). The CDFW also maintains a list of candidate species, which are species that the CDFW has formally noticed as under review for addition to the threatened or endangered species lists. The CDFW also maintains lists of Species of Special Concern that serve as watch lists. Pursuant to CESA requirements, an agency reviewing a proposed project within its jurisdiction must determine whether any State-listed endangered or threatened species may be present in the project site and determine whether the proposed project will have a potentially significant impact on such species. The CDFW encourages informal consultation on any proposed project that may affect a candidate species. The CESA also requires a permit to take a State-listed species through incidental or otherwise lawful activities (§ 2081, subd. (b)).</p>
Lake and Streambed Alteration Program (Fish & G. Code, §§ 1600-1616)	<p>The CDFW regulates activities that would interfere with the natural flow of, or substantially alter, the channel, bed, or bank of a lake, river, or stream. These regulations require notification of the CDFW for lake or stream alteration activities. If, after notification is complete, the CDFW determines that the activity may substantially adversely affect an existing fish and wildlife resource, the CDFW has authority to issue a Streambed Alteration Agreement.</p>

Biological Resources (State)	
<p>Marine Invasive Species Act (MISA) (Assembly Bill [AB] 433)</p>	<p>Originally passed in 2003 and amended several times, the purpose of MISA was to move towards eliminating the discharge of non-indigenous species into waters of the state or waters that may impact waters of the state, based on the best available technology economically achievable. MISA requires mid-ocean exchange or retention of all ballast water and associated sediments for all vessels over 300 gross registered tons, U.S. and foreign, carrying ballast water into the waters of the state after operating outside the waters of the State. For all vessels over 300 gross register tons arriving at a California port or place carrying ballast water from another port or place within the Pacific Coast Region, the Act mandates near-coast exchange or retention of all ballast water. MISA also requires completion and submission of Ballast Water Report Form upon departure from each port of call in California, annual submittal of a hull husbandry reporting form, the keeping of a ballast management plan and logs, and the application of "Good Housekeeping" Practices designed to minimize the transfer and introduction of invasive species. Compliance with MISA is the responsibility of the vessel owners/operators and not the responsibility of marine terminals.</p>
<p>Other relevant California Fish and Game Code sections</p>	<ul style="list-style-type: none"> • Sections 900-903 (California Species Preservation Act) provide for the protection and enhancement of amphibians, birds, fish, mammals, and reptiles. • Section 1900 et seq. (California Native Plant Protection Act) is intended to preserve, protect, and enhance endangered or rare native plants in California. This Act includes provisions that prohibit the taking of listed rare or endangered plants from the wild and a salvage requirement for landowners. The Act directs the CDFW to establish criteria for determining what native plants are rare or endangered. Under section 1901, a species is endangered when its prospects for survival and reproduction are in immediate jeopardy from one or more causes. A species is rare when, although not threatened with immediate extinction, it is in such small numbers throughout its range that it may become endangered. • Sections 3503 & 3503.5 prohibit the taking and possession of native birds' nests and eggs from all forms of needless take and provide that it is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nests or eggs of any such bird except as otherwise provided by this Code or any regulation adopted pursuant thereto. • Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), & 5515 (fish) designate certain species as "fully protected;" such species, or parts thereof, may not be taken or possessed at any time without permission by the CDFW. • Section 3513 does not include statutory or regulatory mechanism for obtaining an incidental take permit for the loss of non-game, migratory birds.
<p>Other</p>	<ul style="list-style-type: none"> • McAteer-Petris Act. (See Multiple Environmental Issues.) • Suisun Marsh Preservation Act. (<i>See Land Use and Planning.</i>) • Lempert-Keene-Seastrand Oil Spill Prevention and Response Act. (<i>See Hazards and Hazardous Materials.</i>) • California Aquatic Invasive Species Management Plan, produced by the CDFW, provides a framework for agency coordination and identifies actions to minimize the harmful effects of aquatic invasive species. • California Noxious and Invasive Weed Action Plan, produced by the California Department of Food and Agriculture, serves to protect and enhance the California economy, natural environment, and citizen safety through awareness, cooperation, and action in the prevention and control of noxious and invasive weeds. • California Wetlands Conservation Policy is that there shall be no net loss of wetland acreage and a long-term gain in the quantity, quality, and permanence of California's wetlands. • Delta Smelt Action Plan of 2005, produced by the Department of Water Resources and CDFW, is a 14-point program of scientific research activities and studies to identify and understand the causes of the Pelagic Organism Decline, and other actions to benefit the species.

**CULTURAL AND PALEONTOLOGICAL RESOURCES /
TRADITIONAL CULTURAL PROPERTIES / SACRED SITES**

Cultural Resources (Federal)	
Archaeological and Historic Preservation Act (AHPA)	The AHPA provides for the preservation of historical and archaeological data that might be irreparably lost or destroyed as a result of (1) flooding, the building of access roads, the erection of workmen’s communities, the relocation of railroads and highways, and other alterations of terrain caused by the construction of a dam by an agency of the U.S. or by any private person or corporation holding a license issued by any such agency; or (2) any alteration of the terrain caused as a result of a federal construction project or federally licensed project, activity, or program. This Act requires federal agencies to notify the Secretary of the Interior when they find that any federally permitted activity or program may cause irreparable loss or destruction of significant scientific, prehistoric, historical, or archaeological data. The AHPA built upon national policy, set out in the Historic Sites Act of 1935, "...to provide for the preservation of historic American sites, buildings, objects, and antiquities of national significance...."
Archaeological Resources Protection Act (ARPA)	<p>The ARPA states that archaeological resources on public or Indian lands are an accessible and irreplaceable part of the nation’s heritage and:</p> <ul style="list-style-type: none"> • Establishes protection for archaeological resources to prevent loss and destruction due to uncontrolled excavations and pillaging; • Encourages increased cooperation and exchange of information between government authorities, the professional archaeological community, and private individuals having collections of archaeological resources prior to the enactment of this Act; • Establishes permit procedures to permit excavation or removal of archaeological resources (and associated activities) located on public or Indian land; and • Defines excavation, removal, damage, or other alteration or defacing of archaeological resources as a “prohibited act” and provides for criminal and monetary rewards to be paid to individuals furnishing information leading to the finding of a civil violation or conviction of a criminal violator. <p>The ARPA’s enforcement provision provides for the imposition of both criminal and civil penalties against violators of the Act. The ARPA's permitting component allows for recovery of certain artifacts consistent with NPS Federal Archeology Program standards and requirements.</p>
Federal Executive Orders (EO)	<ul style="list-style-type: none"> • EO 13007, Indian Sacred Sites, requires federal agencies with administrative or legal responsibility to manage Federal lands to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sites (to the extent practicable permitted by law and not clearly inconsistent with essential agency functions) • EO 13158 requires federal agencies to (1) identify actions that affect natural or cultural resources that are within an MPA; and (2) in taking such actions, to avoid harm to the natural and cultural resources that are protected by a MPA.
National Historic Preservation Act (NHPA) (16 USC 470 et seq.) (applies only to Federal undertakings)	Archaeological resources are protected through the NHPA and its implementing regulation (Protection of Historic Properties; 36 CFR 800), the AHPA, and the ARPA. This Act presents a general policy of supporting and encouraging the preservation of prehistoric and historic resources for present and future generations by directing federal agencies to assume responsibility for considering the historic resources in their activities. The State implements the NHPA through its statewide comprehensive cultural resource surveys and preservation programs coordinated by the California Office of Historic Preservation (OHP) in the State Department of Parks and Recreation, which also advises federal agencies regarding potential effects on historic properties. The OHP also maintains the California Historic Resources Inventory. The State Historic Preservation Officer (SHPO) is an appointed official who implements historic preservation programs within the State’s jurisdictions, including commenting on Federal undertakings. Under the NHPA, historic properties include “any prehistoric or

Cultural Resources (Federal)	
	historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places" (16 U.S.C. 470w [5]).
National Park Service Abandoned Shipwreck Act of 1987 (43 USC 2101–2106).	Under this Act, states have the responsibility for management of living and nonliving resources in State waters and submerged lands, including certain abandoned shipwrecks that have been deserted and to which the owner has relinquished ownership rights with no retention. The NPS has issued guidelines that are intended to: maximize the enhancement of cultural resources; foster a partnership among sport divers, fishermen, archeologists, sailors, and other interests to manage shipwreck resources of the states and the U.S.; facilitate access and utilization by recreational interests; and recognize the interests of individuals and groups engaged in shipwreck discovery and salvage. Specific provisions of the Act's guidelines include procedures for locating and identifying shipwrecks, methods for determining which shipwrecks are historic, and preservation and long-term management of historic shipwrecks.
Omnibus Public Land Management Act of 2009 - Public Law 111-11 (123 Stat. 991)	Public Law 111-011 at Title VI, subtitle D lays out statutory requirements for Paleontological Resources Preservation (PRP). PRP provides definitions but requires the definition of some terms, and uses other terms and concepts that need further definition or details to clarify intent or enforcement. PRP identifies management requirements, collection requirements, curation requirements, need for both criminal and civil penalties, rewards and forfeiture, and the need for confidentiality of some significant resource locations. PRP at section 6310 also states that "As soon as practical after the date of enactment of this Act, the Secretary shall issue such regulations as are appropriate to carry out this subtitle, providing opportunities for public notice and comment."

Cultural Resources (State)	
AB 52 (Gatto, Stats. 2014, Ch. 532)	AB 52 (effective July 1, 2015) adds sections 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2, and 21084.3 to CEQA, relating to consultation with California Native American tribes, consideration of tribal cultural resources, and confidentiality. The definition of tribal cultural resources considers tribal cultural values in addition to scientific and archaeological values when determining impacts and mitigation. AB 52 provides procedural and substantive requirements for lead agency consultation with California Native American tribes and consideration of effects on tribal cultural resources, as well as examples of mitigation measures to avoid or minimize impacts to tribal cultural resources. AB 52 establishes that if a project may cause a substantial adverse change in the significance of a tribal cultural resource, that project may have a significant effect on the environment. Lead agencies must avoid damaging effects to tribal cultural resources, when feasible, and shall keep information submitted by tribes confidential.
California Register of Historical Resources (CRHR)	The CRHR is "an authoritative listing and guide to be used by State and local agencies, private groups, and citizens in identifying the existing historical resources of the State and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (Pub. Resources Code, § 5024.1, subd. (a)). The criteria for eligibility for the CRHR are modeled after National Register of Historic Places (NRHP) criteria (Pub. Resources Code, § 5024.1(b)) but focus on resources of statewide significance. Certain resources are determined by the statute to be automatically included in the CRHR, including California properties formally determined to be eligible for, or listed in, the NRHP. To be eligible for the CRHR, a prehistoric or historical period property must be significant at the local, State, and/or Federal level under one or more of the following criteria (see State CEQA Guidelines, § 15064.5, subd. (a)(3)): <ul style="list-style-type: none"> • Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage. • Is associated with the lives of persons important in California's past. • Embodies the distinctive characteristics of a type, period, region, or method of

Cultural Resources (State)	
	<p>construction, or represents the work of an important creative individual, or possesses high artistic values.</p> <ul style="list-style-type: none"> • Has yielded, or may be likely to yield, information important in prehistory or history. <p>A resource eligible for the CRHR must meet one of the criteria of significance described above, and retain enough of its historic character or appearance (integrity) to be recognizable as an historical resource and to convey the reason for its significance. It is possible that an historic resource may not retain sufficient integrity to meet the criteria for listing in the NRHP, but it may still be eligible for listing in the CRHR. Properties listed, or formally designated as eligible for listing, on the National Register are automatically listed on the CRHR, as are certain State Landmarks and Points of Interest. A lead agency is not precluded from determining that the resource may be an historical resource as defined in Public Resources Code sections 5020.1, subdivision (j), or 5024.1 (State CEQA Guidelines, § 15064.5, subd. (a)(4)).</p>
CEQA (Pub. Resources Code, § 21000 et seq.)	As CEQA lead agency, the CSLC is responsible for complying with all CEQA and State CEQA Guidelines provisions relating to “historical resources.” A historical resource includes: (1) a resource listed in, or eligible for listing in, the California Register of Historic Resources (CRHR); (2) a resource included in a local register of historical or identified as significant in an historical resource surveys; and (3) any resource that a lead agency determines to be historically significant for the purposes of CEQA, when supported by substantial evidence in light of the whole record.
Other	<ul style="list-style-type: none"> • Health and Safety Code section 7050.5 states that if human remains are exposed during construction, no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code section 5097.998. The Coroner has 24 hours to notify the Native American Heritage Commission (NAHC) if the remains are determined to be of Native American descent. The NAHC will contact most likely descendants, who may recommend how to proceed. • Public Resources Code section 5097.5 prohibits excavation or removal of any “vertebrate paleontological site or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands.” Penal Code section 623 spells out regulations for the protection of caves, including their natural, cultural, and paleontological contents. It specifies that no “material” (including all or any part of any paleontological item) will be removed from any natural geologically formed cavity or cave. • Public Resources Code section 5097.98 states protocol for notifying the most likely descendent from the deceased if human remains are determined to be Native American in origin. It also provides mandated measures for appropriate treatment and disposition of exhumed remains. • Executive Order B-10-11 establishes as state policy that all agencies and departments shall encourage communication and consultation with California Indian Tribes and allow tribal governments to provide meaningful input into proposed decisions and policies that may affect tribal communities.

GEOLOGY AND SOILS

Geology and Soils (Federal/International)	
Uniform Building Code (UBC)	The UBC designates and ranks regions of the United States, according to their seismic hazard potential, as Seismic Zones 1 through 4, with Zone 1 having the least seismic potential and Zone 4 having the highest seismic potential.
International Building Code (IBC)	The IBC sets design standards to accommodate a “maximum considered earthquake” or MCE, based on a project’s regional location, site characteristics, and other factors.

Geology and Soils (State)	
Alquist-Priolo Earthquake Fault Zoning Act (Pub. Resources Code, §§ 2621-2630)	This Act requires that "sufficiently active" and "well-defined" earthquake fault zones be delineated by the State Geologist and prohibits locating structures for human occupancy on active and potentially active surface faults. (Note that since only those potentially active faults that have a relatively high potential for ground rupture are identified as fault zones, not all potentially active faults are zoned under the Alquist-Priolo Earthquake Fault Zone, as designated by the State of California.)
California Building Code (CBC) (Cal. Code Regs., tit. 23)	The State of California provides a minimum standard for building design through the CBC, which is based on the UBC, but has been modified for conditions unique to California. The CBC is selectively adopted by local jurisdictions, based on local conditions. The CBC contains requirements pertaining to multiple activities, including: excavation, site demolition, foundations and retaining walls, grading activities including drainage and erosion control, and construction of pipelines alongside existing structures. For example, sections 3301.2 and 3301.3 contain provisions requiring protection of adjacent properties during excavations and require a 10-day written notice and access agreements with adjacent property owners.
Seismic Hazards Mapping Act (Pub. Resources Code, § 2690) & Mapping Regulations (Cal. Code Regs., tit. 14, Div. 2, Ch. 8, Art. 10).	These regulations were promulgated for the purpose of promoting public safety by protecting against the effects of strong ground shaking, liquefaction, landslides, other ground failures, or other hazards caused by earthquakes. The Act requires that site-specific geotechnical investigations be conducted identifying the hazard and formulating mitigation measures prior to permitting most developments designed for human occupancy. Special Publication 117, <i>Guidelines for Evaluating and Mitigating Seismic Hazards in California</i> (California Division of Mines and Geology [CDMG] 1997), constitutes the guidelines for evaluating seismic hazards other than surface fault-rupture, and for recommending mitigation measures as required by Public Resources Code section 2695, subdivision (a). The Act does not apply offshore as the California Geological Survey has not zoned offshore California under the Act.

GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

Greenhouse Gas Emissions and Climate Change (Federal & International)	
Federal Clean Air Act (FCAA) (42 USC 7401 et seq.)	In 2007, the U.S. Supreme Court ruled that carbon dioxide (CO ₂) is an air pollutant as defined under the FCAA, and that the USEPA has authority to regulate GHG emissions.
Mandatory Greenhouse Gas Reporting (74 FR 56260)	On September 22, 2009, the USEPA issued the Mandatory Reporting of Greenhouse Gases Rule, which requires reporting of GHG data and other relevant information from large sources and suppliers in the U.S. The purpose of the Rule is to collect accurate and timely GHG data to inform future policy decisions. The Rule is referred to as 40 CFR Part 98 (Part 98). Implementation of Part 98 is referred to as the GHG Reporting Program (GHGRP). The gases covered by the GHGRP are CO ₂ , methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and other fluorinated gases including nitrogen trifluoride and hydrofluorinated ethers.
Kyoto Protocol	On March 21, 1994, the Kyoto Protocol was signed. The Kyoto Protocol was a treaty made under the United Nations Framework Convention on Climate Change, and was the first international agreement to regulate GHG emissions. If the commitments outlined in the Kyoto Protocol are met, global GHG emissions would be reduced by 5 percent from 1990 levels during the commitment period of 2008 to 2012. Although the U.S. is a signatory to the Kyoto Protocol, Congress has not ratified it, therefore the U.S. is not bound by the Protocol's commitments.

Greenhouse Gas Emissions and Climate Change (Federal & International)	
Paris Climate Agreement	In December 2015, the Paris Climate Agreement (Agreement) was endorsed and adopted by 195 countries. The overarching goal was to reduce pollution levels so that the rise in global temperatures is limited to no more than 2 °C (3.6 °F). The Agreement also contains language urging that the increase be limited even further to 1.5 °C (2.7 °F), if possible. The Agreement includes voluntary commitments from 186 of the 195 signatories, including the U.S., to cut or limit the growth of their GHG emissions. The signatories agreed to convene every 5 years to take stock, revisit their pledges, and steadily increase them to achieve the 2 °C goal. The new agreement also requires regular and transparent reporting of every country's carbon reductions and identifies a goal of mobilizing \$100 billion per year in support of developing countries by 2020 through 2025, with a new, higher goal to be set after 2025.

Greenhouse Gas Emissions and Climate Change (State)	
California Global Warming Solutions Act of 2006 (AB 32)	Under AB 32, CARB is responsible for monitoring and reducing GHG emissions in the State and for establishing a statewide GHG emissions cap for 2020 that is based on 1990 emissions levels. CARB (2009) has adopted the AB 32 Climate Change Scoping Plan (Scoping Plan), which contains the main strategies for California to implement to reduce CO ₂ equivalent (CO ₂ e) emissions by 169 million metric tons (MMT) from the State's projected 2020 emissions level of 596 MMT CO ₂ e under a business-as-usual scenario. The Scoping Plan breaks down the amount of GHG emissions reductions CARB recommends for each emissions sector of the State's GHG inventory, but does not directly discuss GHG emissions generated by construction activities.
AB 1493	In 2002, with the passage of AB 1493, California launched an innovative and proactive approach to dealing with GHG emissions and climate change at the state level. AB 1493 requires CARB to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobile and light trucks beginning with the model year 2009. Although litigation challenged these regulations and the USEPA initially denied California's related request for a waiver, the waiver request was granted (USEPA 2010c).
SB 97	Pursuant to SB 97, the State Office of Planning and Research prepared and the Natural Resources Agency adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. Effective as of March 2010, the revisions to the CEQA Environmental Checklist Form (Appendix G) and the Energy Conservation Appendix (Appendix F) provide a framework to address global climate change impacts in the CEQA process; State CEQA Guidelines section 15064.4 was also added to provide an approach to assessing impacts from GHGs.
SB 350	The 2015 Clean Energy and Pollution Reduction Act was signed into law on October 10, 2015, and requires that the amount of electricity generated and sold to retail customers from renewable energy resources be increased to 50 percent by December 31, 2030, and that a doubling of statewide energy efficiency savings in electricity and natural gas by retail customers be achieved by January 1, 2030.
SB 375	SB 375 (effective January 1, 2009) requires CARB to develop regional reduction targets for GHG emissions, and prompted the creation of regional land use and transportation plans to reduce emissions from passenger vehicle use throughout the State. The targets apply to the regions covered by California's 18 metropolitan planning organizations (MPOs). The 18 MPOs must develop regional land use and transportation plans and demonstrate an ability to attain the proposed reduction targets by 2020 and 2035.

Greenhouse Gas Emissions and Climate Change (State)	
State Executive Orders (EOs)	<ul style="list-style-type: none"> • EO B-30-15 (Governor Brown, April 2015) established a new interim statewide GHG emission reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030 in order to ensure California meets its target to reduce GHG emissions to 80 percent below 1990 levels by 2050. State agencies with jurisdiction over sources of GHG emissions to implement measures were also directed pursuant to statutory authority, to achieve GHG emissions reductions to meet the 2030 and 2050 targets. • EO S-01-07 (Governor Schwarzenegger, January 2007) set a low carbon fuel standard for California, and directed the carbon intensity of California's transportations fuels to be reduced by at least 10 percent by 2020. • EO S-3-05 (Governor Schwarzenegger, June 2005) directed the state to reduce GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 level by 2050.

HAZARDS AND HAZARDOUS MATERIALS

Hazards and Hazardous Materials (Federal)	
California Toxics Rule (40 CFR 131)	In 2000, the USEPA promulgated numeric water quality criteria for priority toxic pollutants and other water quality standards provisions to be applied to waters in California to protect human health and the environment. Under CWA section 303(c)(2)(B), the USEPA requires states to adopt numeric water quality criteria for priority toxic pollutants for which the USEPA has issued criteria guidance, and the presence or discharge of which could reasonably be expected to interfere with maintaining designated uses. These Federal criteria are legally applicable in California for inland surface waters, enclosed bays, and estuaries.
Hazardous Liquid Pipeline Safety Act of 1979	This Act includes requirements for hazardous liquid pipelines, which fall under the jurisdiction of the DOT, including accident reporting, design, and construction requirements, and minimum requirements for hydrostatic testing, compliance dates, test pressures, and duration; and records.
National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR 300)	Authorized under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA: 42 USC 9605), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA: Pub. L. 99-499); and by CWA section 311(d), as amended by the OPA (Pub. L. 101-380), the NCP outlines requirements for responding to oil spills and hazardous substance releases. It specifies compliance, but does not require preparation of a written plan, and provides a comprehensive system for reporting, spill containment, and cleanup. Per 40 CFR 300.175 and 40 CFR 300.120, the USCG has responsibility for oversight of regional response for oil spills in "coastal zones."
Oil Pollution Act (OPA) of 1990 (33 USC 2712)	The OPA requires owners and operators of facilities that could cause substantial harm to the environment to prepare and submit, and maintain up-to-date, plans for responding to worst-case discharges of oil and hazardous substances and for facilities and vessels to demonstrate that they have sufficient response equipment under contract to respond to and clean up a worst-case spill. The passage of the OPA motivated California to pass a more stringent spill response and recovery regulation and the creation of the OSPR to review and regulate oil spill plans and contracts. The OPA includes provisions to expand prevention and preparedness activities, improve response capabilities, provide funding for natural resource damage assessments, ensure that shippers and oil companies pay the costs of spills that do occur, and establish an expanded research and development program. Pursuant to a Memorandum of Understanding established to divide areas of responsibility, the USCG is responsible for tank vessels and marine terminals, the USEPA for tank farms, and the Research and Special Programs Administration for pipelines; each of these agencies has developed regulations for its area of responsibility. In addition, the Secretary of Interior is responsible for spill prevention, oil-spill contingency plans, oil-

Hazards and Hazardous Materials (Federal)	
	spill containment and clean-up equipment, financial responsibility certification, and civil penalties for offshore facilities and associated pipelines in all federal and State waters.
Resource Conservation and Recovery Act (RCRA) (42 USC 6901 et seq.)	The RCRA authorizes the USEPA to control hazardous waste from “cradle-to-grave” (generation, transportation, treatment, storage, and disposal). RCRA’s Federal Hazardous and Solid Waste Amendments from 1984 include waste minimization and phasing out land disposal of hazardous waste as well as corrective action for releases. The Department of Toxic Substances Control is the lead State agency for corrective action associated with RCRA facility investigations and remediation.
Toxic Substances Control Act (TSCA) (15 USC 2601–2692)	The TSCA authorizes the USEPA to require reporting, record-keeping, testing requirements, and restrictions related to chemical substances and/or mixtures. It also addresses production, importation, use, and disposal of specific chemicals, such as polychlorinated biphenyls (PCBs), asbestos-containing materials, lead-based paint, and petroleum.
Other Relevant Laws, Regulations, and Recognized National Codes and Standards	<ul style="list-style-type: none"> • CWA. (See Hydrology and Water Quality.) • Hazardous Materials Transportation Act. (<i>See Transportation/Traffic.</i>) • 33 CFR, Navigation and Navigable Waters, regulates aids to navigation, vessel operations, anchorages, bridges, security of vessels, waterfront facilities, marine pollution financial responsibility and compensation, prevention and control of releases of materials (including oil spills) from vessels, ports and waterways safety, boating safety, and deep-water ports. The USEPA is responsible for the National Contingency Plan and for developing regulations for SPCC plans and regulates disposal of recovered oil. • 40 CFR Parts 109, 110, 112, 113, and 114. The Spill Prevention Countermeasures and Control (SPCC) plans covered in these regulatory programs apply to oil storage and transportation facilities and terminals, tank farms, bulk plants, oil refineries, and production facilities, and bulk oil consumers (e.g., apartment houses, office buildings, schools, hospitals, government facilities). These regulations include minimum criteria for developing oil-removal contingency plans, prohibit discharge of oil such that applicable water quality standards would be violated, and address oil spill prevention and preparation of SPCC plans. They also establish financial liability limits and provide civil penalties for violations of the oil spill regulations. • 46 CFR parts 1 through 599 and Inspection and Regulation of Vessels (46 USC Subtitle II Part B) provide that all vessels operating offshore, including those under foreign registration, are subject to requirements applicable to vessel construction, condition, and operation. All vessels (including motorboats) operating in commercial service (e.g., passengers for hire, transport of cargoes, hazardous materials, and bulk solids) on specified routes (inland, near coastal, and oceans) are subject to requirements applicable to vessel construction, condition, and operation. These regulations also allow for inspections to verify that vessels comply with applicable international conventions and U.S. laws and regulations. • Act of 1980 to Prevent Pollution from Ships requires ships in U.S. waters, and U.S. ships wherever located, to comply with International Convention for the Prevention of Pollution from Ships (MARPOL). • Convention on the International Regulations for Preventing Collisions at Sea establish “rules of the road” such as rights-of-way, safe speed, actions to avoid collision, and procedures to observe in narrow channels and restricted visibility. • Fire and Explosion Prevention and Control, National Fire Protection Agency (NFPA) Standards. • Safety and Corrosion Prevention Requirements — ASME, National Association of Corrosion Engineers (NACE), ANSI <ul style="list-style-type: none"> ○ ASME & ANSI B16.1 Cast Iron Pipe Flanges and Flanged Fittings; ○ ASME & ANSI B16.9, Factory-Made Wrought Steel Butt Welding Fittings; ○ ASME & ANSI B31.1a, Power Piping; ○ ASME & ANSI B31.4a, addenda to ASME B31.4a-1989 Edition, Liquid

Hazards and Hazardous Materials (Federal)	
	<p>Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia, and Alcohols;</p> <ul style="list-style-type: none"> ○ NACE Standard RP0190-95, Item No. 53071. Standard Recommended Practice External Protective Coatings for Joints, Fittings, and Valves on Metallic Underground or Submerged Pipelines and Piping Systems; and ○ NACE Standard RP0169-96, Item No. 53002. Standard Recommended Practice Control of External Corrosion on Underground or Submerged Metallic Piping Systems.

Hazards and Hazardous Materials (State)	
Lempert-Keene-Seastrand Oil Spill Prevention and Response Act (OSPRA; Gov. Code, § 8670.1 et seq., Pub. Resources Code, § 8750 et seq., and Rev. & Tax. Code, § 46001 et seq.)	The OSPRA and its implementing regulations seek to protect State waters from oil pollution and to plan for the effective and immediate response, removal, abatement, and cleanup in the event of an oil spill. The Act requires applicable operators to prepare and implement marine oil spill contingency plans and to demonstrate financial responsibility, and requires immediate cleanup of spills, following the approved contingency plans, and fully mitigating impacts on wildlife. The Act assigns primary authority to OSPR within the CDFW to direct prevention, removal, abatement, response, containment, and cleanup efforts with regard to all aspects of any oil spill in the marine waters of the State; the CSLC is also provided with authority for oil spill prevention from and inspection of marine facilities and assists OSPR with spill investigations and response. Notification is required to the Governor's State Office of Emergency Services, which in turn notifies the response agencies, of all oil spills in the marine environment, regardless of size. The Act also created the Oil Spill Prevention and Administration Fund and the Oil Spill Response Trust Fund. Pipeline operators pay fees into the first of these funds for pipelines transporting oil into the State across, under, or through marine waters.
Elder California Pipeline Safety Act of 1981 (Gov. Code, § 51010-51018) & California Code of Regulations, title 19, Public Safety	The California Pipeline Safety Act gives regulatory jurisdiction to the California State Fire Marshal (CSFM) for the safety of all intrastate hazardous liquid pipelines and all interstate pipelines used for the transportation of hazardous or highly volatile liquid substances. The law establishes the governing rules for interstate pipelines to be the Federal Hazardous Liquid Pipeline Safety Act and Federal pipeline safety regulations. Government Code sections 51010 through 51018 provide specific safety requirements that are more stringent than the Federal rules, including periodic hydrostatic testing of pipelines, pipeline leak detection, and a requirement that all leaks be reported. Recent amendments require that pipelines include leak prevention and cathodic protection, with acceptability to be determined by the CSFM. All new pipelines must be designed to accommodate the passage of instrumented inspection devices (i.e., smart pigs). Under California Code of Regulations, title 19, Public Safety, the CSFM develops regulations relating to fire and life safety. These regulations have been prepared and adopted to establish minimum standards for the prevention of fire and for protection of life and property against fire, explosion, and panic. The CSFM also adopts and administers the regulations and standards considered necessary under the California Health and Safety Code to protect life and property, including California Health and Safety Code sections 13160 (Portable Fire Extinguishers) and 13195 (Automatic Fire Extinguishers Systems).
Oil Pipeline Environmental Responsibility Act (Assembly Bill [AB] 1868)	This Act requires every pipeline corporation qualifying as a public utility and transporting crude oil in a public utility oil pipeline system to be held strictly liable for any damages incurred by "any injured party which arise out of, or caused by, the discharge or leaking of crude oil or any fraction thereof...." The law applies only to public utility pipelines for which construction would be completed after January 1, 1996, or that part of an existing utility pipeline that is being relocated after the above date and is more than 3 miles in length.

Hazards and Hazardous Materials (State)	
Other	<ul style="list-style-type: none"> • California Code of Regulations, title 22, division 4.5 regulates hazardous wastes and materials by the implementation of a Unified Program to ensure consistency throughout the state in administration requirements, permits, inspections, and enforcement through a Certified Unified Program Agency (CUPA). • Fire Code regulations (Cal. Code Regs, tit 24, part 9) state hazardous materials should be used and storage in compliance with the state fire codes. • Harbors and Navigation Code specifies a State policy to “promote safety for persons and property in and connected with the use and equipment of vessels,” and includes laws concerning marine navigation that are implemented by local city and county governments. This Code also regulates discharges from vessels within territorial waters of the State of California to prevent adverse impacts on the marine environment. This Code regulates oil discharges and imposes civil penalties and liability for cleanup costs when oil is intentionally or negligently discharged to the State waters. • Hazardous Material Release Response Plans and Inventory Law (Health & Saf. Code, Ch. 6.95) is designed to reduce the occurrence and severity of hazardous materials releases. This State law requires businesses to develop a Release Response Plan for hazardous materials emergencies if they handle more than 500 pounds, 55 gallons, or 200 cubic feet of hazardous materials. In addition, the business must prepare a Hazardous Materials Inventory of all hazardous materials stored or handled at the facility over the above thresholds, and all hazardous materials must be stored in a safe manner. • Hazardous Waste Control Act (Cal. Code Regs., tit. 26) defines requirements for proper management of hazardous materials. • Hazardous Waste Control Law (Health & Saf. Code, Ch. 6.5 & Cal. Code Regs., tit. 22 and 26) is the basic hazardous waste law for California. It establishes the criteria for defining hazardous waste and its safe handling, storage, treatment, and disposal. The law is designed to provide cradle-to-grave management of hazardous wastes and reduce the occurrence and severity of hazardous materials releases. • Health and Safety Code Regulations, titles 22 and 26: regulates the management of hazardous materials • Porter-Cologne Water Quality Control Act. (<i>See Hydrology and Water Quality.</i>) • Seismic Hazards Mapping Act and Seismic Hazards Mapping Regulations. (<i>See Geology and Soils.</i>)

HYDROLOGY AND WATER QUALITY

Hydrology and Water Quality (Federal)	
Federal Clean Water Act (33 USC 1251 et seq.)	<p>The CWA is comprehensive legislation (it generally includes reference to the Federal Water Pollution Control Act of 1972, its supplementation by the CWA of 1977, and amendments in 1981, 1987, and 1993) that seeks to protect the nation’s water from pollution by setting water quality standards for surface water and by limiting the discharge of effluents into waters of the U.S. These water quality standards are promulgated by the USEPA and enforced in California by the SWRCB and nine RWQCBs. CWA sections include:</p> <ul style="list-style-type: none"> • <u>Section 401 (33 USC 1341)</u> specifies that any applicant for a federal permit or license to conduct any activity which may result in any discharge into the navigable waters of the United States to obtain a certification or waiver thereof from the state in which the discharge originates that such a discharge will comply with established state effluent limitations and water quality standards. USACE projects are required to obtain this certification. • <u>Section 402 (33 USC 1342)</u> establishes conditions and permitting for discharges of pollutants under the National Pollution Discharge Elimination System) (NPDES).

Hydrology and Water Quality (Federal)	
	<p>Under the NPDES Program, states establish standards specific to water bodies and designate the types of pollutants to be regulated, including total suspended solids and oil; all point sources that discharge directly into waterways are required to obtain a permit regulating their discharge. NPDES permits fall under the jurisdiction of the SWRCB or RWQCBs when the discharge occurs within California's territorial limit (out to 3 nautical miles).</p> <ul style="list-style-type: none"> • <u>Section 404 (33 USC 1344)</u> authorizes the USACE to issue permits for the discharge of dredged or fill material into waters of the United States, including wetlands, streams, rivers, lakes, coastal waters or other water bodies or aquatic areas that qualify as waters of the United States.
Rivers and Harbors Act (33 USC 401)	<p>This Act governs specified activities in "navigable waters" (waters subject to the ebb and flow of the tide or that are presently used, have been used in the past, or may be susceptible for use to transport interstate or foreign commerce). Specifically, it limits the construction of structures and the discharge of fill into navigable waters of the U.S. Under Section 10, the following activities require approval from the USACE or authorization from the Secretary of War:</p> <ul style="list-style-type: none"> • building of any wharf, pier, dolphin, boom, weir, breakwater, bulkhead, jetty, or other structures in any port, roadstead, haven, harbor, canal, or navigable river; • excavation or fill in any manner to alter or modify the course, location, condition, or capacity of, any port, roadstead, haven, harbor, canal, lake, harbor of refuge, or enclosure within the limits of any breakwater, or of any channel of any navigable waters of the U.S.
Other	<ul style="list-style-type: none"> • Oil Pollution Act (OPA). (See Hazards and Hazardous Materials.) • The Marine Plastic Pollution Research and Control Act prohibits the discharge of plastic, garbage, and floating wood scraps within 3 nm of land. Beyond 3 nm, garbage must be ground to less than one inch, but discharge of plastic and floating wood scraps is still restricted. This Act requires manned offshore platforms, drilling rigs, and support vessels operating under a Federal oil and gas lease to develop waste management plans. • Navigation and Navigable Waters (33 CFR) regulations include requirements pertaining to prevention and control of releases of materials from vessels (e.g., oil spills), traffic control, and restricted areas, and general ports and waterways safety.

Hydrology and Water Quality (State)	
Porter-Cologne Water Quality Control Act (Wat. Code, § 13000 et seq.) (Porter-Cologne)	<p>Porter-Cologne is the principal law governing water quality in California. The Act established the SWRCB and nine RWQCBs, which have primary responsibility for protecting State water quality and the beneficial uses of State waters. Porter-Cologne also implements many provisions of the federal CWA, such as the NPDES permitting program. Pursuant to CWA section 401, applicants for a federal license or permit for activities that may result in any discharge to waters of the United States must seek a Water Quality Certification from the State in which the discharge originates; such Certification is based on a finding that the discharge will meet water quality standards and other appropriate requirements of State law. In California, RWQCBs issue or deny certification for discharges within their jurisdiction. The SWRCB has this responsibility where projects or activities affect waters in more than one RWQCB's jurisdiction. If the SWRCB or a RWQCB imposes a condition on its Certification, those conditions must be included in the federal permit or license. Plans that contain enforceable standards for the various waters they address include the following:</p> <ul style="list-style-type: none"> • <u>Basin Plan</u>. Porter-Cologne (see § 13240) requires each RWQCB to formulate and adopt a Basin Plan for all areas within the region. Each RWQCB must establish water quality objectives to ensure the reasonable protection of beneficial uses, and an implementation program for achieving water quality objectives within the basin plan. In California, the beneficial uses and water quality objectives are the State's water quality standards.

Hydrology and Water Quality (State)	
	<ul style="list-style-type: none"> • The <u>California Ocean Plan</u> (see § 13170.2) establishes water quality objectives for California's ocean waters and provides the basis for regulating wastes discharged into ocean and coastal waters. The plan applies to point and non-point sources. In addition, the Ocean Plan identifies applicable beneficial uses of marine waters and sets narrative and numerical water quality objectives to protect beneficial uses. The SWRCB first adopted this plan in 1972, and it reviews the plan at least every 3 years to ensure that current standards are adequate and are not allowing degradation to indigenous marine species or posing a threat to human health. • <u>Other water quality control plans</u> include: Water Quality Control Plan for Enclosed Bays and Estuaries of California; Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan); and San Francisco Bay/Sacramento-San Joaquin Delta Estuary Water Quality Control Plan. <p>RWQCBs also oversee on-site treatment of "California Designated, Non-Hazardous Waste" and enforces water quality thresholds and standards set forth in the Basin Plan. Applicants may be required to obtain a General Construction Activities Storm Water Permit under the NPDES program, and develop and implement a Storm Water Pollution Prevention Plan (SWPPP) that includes best management practices (BMPs) to control erosion, siltation, turbidity, and other contaminants associated with construction activities. The SWPPP would include BMPs to control or prevent the release of non-storm water discharges, such as crude oil, in storm water runoff.</p>
Bay Protection and Toxic Cleanup Program Legislation	In 1989, the Legislature required the SWRCB to develop sediment quality objectives (SQOs) as part of a comprehensive program to protect beneficial uses in enclosed bays and estuaries. The objectives are required for toxic pollutants identified in toxic hot spots or as pollutants of concern by the SWRCB. In 2009, the SWRCB adopted SQOs and an implementation policy for bays and estuaries in the State (Part 1). Part 1 includes narrative SQOs for the protection of aquatic life and human health, identification of the beneficial uses that these objectives are intended to protect, and requirements for program of implementation. The SWRCB is proposing amendments to the Sediment Quality Plan for Enclosed Bays and Estuaries to incorporate additional SQOs for the protection of wildlife and finfish and implementation policy.
Fish and Game Code sections 1601 to 1603	Under these sections, CDFW must be notified prior to any project that would divert, obstruct, or change the natural flow, bed, channel, or bank of any river, stream, or lake. The term "stream" can include perennial, intermittent, and ephemeral streams; rivers; creeks; dry washes; sloughs; and watercourses with subsurface flows.
Harbors and Navigation Code sections 650-674	This code specifies a State policy to "promote safety for persons and property in and connected with the use and equipment of vessels," and includes laws concerning marine navigation that are implemented by local city and county governments. This Code also regulates discharges from vessels within territorial waters of the State of California to prevent adverse impacts on the marine environment. This code regulates oil discharges and imposes civil penalties and liability for cleanup costs when oil is intentionally or negligently discharged to the waters of the State of California.
Other sections	<ul style="list-style-type: none"> • Water Code section 8710 requires that a reclamation board permit be obtained prior to the start of any work, including excavation and construction activities, if projects are located within floodways or levee sections. Structures for human habitation are not permitted within designated floodways. • Water Code section 13142.5 provides marine water quality policies stating that wastewater discharges shall be treated to protect present and future beneficial uses, and, where feasible, to restore past beneficial uses of the receiving waters. The highest priority is given to improving or eliminating discharges that adversely affect wetlands, estuaries, and other biologically sensitive sites; areas important for water contact sports; areas that produce shellfish for human consumption; and ocean areas subject to massive waste discharge.

LAND USE AND PLANNING

See also Multiple Environmental Issues for laws, regulations, and policies related to land use and planning.

Land Use and Planning (Federal)	
There are no major federal laws, regulations, and policies potentially applicable to this project	

Land Use and Planning (State)	
Nejedly-Bagley-Z'berg Suisun Marsh Preservation Act (Pub. Resources Code, §§ 29000-29612)	<p>In 1974, the California State Legislature enacted the Suisun Marsh Preservation Act to protect Suisun Marsh from urban development. The Suisun Marsh comprises approximately 85,000 acres of tidal marsh, managed wetlands, and waterways in southern Solano County. It is the largest remaining wetland near San Francisco Bay and includes more than 10 percent of California's remaining wetland area. The Marsh is also a wildlife habitat of nationwide importance. In 1976, BCDC developed the Suisun Marsh Protection Plan, which was designed to be a more specific application of the general, regional policies of the San Francisco Bay Plan and to supplement such policies where appropriate because of the unique characteristics of the Suisun Marsh. The Suisun Marsh Protection Plan states that its focus is on maintaining waterfowl habitat, but it also addresses the importance of tidal wetlands. The plan calls for the preservation of Suisun Marsh; preservation of waterfowl habitat; improvement to water distribution and levee systems; and encourages agriculture that is consistent with wildlife and waterfowl, such as grazing. The Legislature subsequently enacted the Suisun Marsh Preservation Act of 1977, which incorporates the findings and policies contained in the plan into state law, calls for the implementation of the Suisun Marsh Protection Plan and designates BCDC as the state agency with jurisdiction over Suisun Marsh. It also gives the Suisun Resource Conservation District local responsibility for water management on privately owned lands in the Marsh. A key issue of the Suisun Marsh Preservation Act and Suisun Marsh Protection Plan was the classification of two management areas within the Marsh. The Primary Management Area is made up of tidal marshes, seasonal marshes, managed wetlands and lowland grasslands and the Secondary Management Area is made up of upland grasslands and cultivated lands which serve as a buffer between the Primary Management Area and adjacent developed lands within the Secondary Management Area. Policies of the Suisun Marsh Protection Plan include:</p> <ul style="list-style-type: none"> • The diversity of habitats in the Suisun Marsh and surrounding upland areas should be preserved and enhanced wherever possible to maintain the unique wildlife resource. • The Marsh waterways, managed wetlands, tidal marshes, seasonal marshes, and lowland grasslands are critical habitats for marsh-related wildlife and are essential to the integrity of the Suisun Marsh. Therefore, these habitats deserve special protection. • Existing uses should continue in the upland grasslands and cultivated areas surrounding the critical habitats of the Suisun Marsh in order to protect the Marsh and preserve valuable marsh-related wildlife habitats. Where feasible, the value of the upland grasslands and cultivated lands as habitat for marsh-related wildlife should be enhanced. • The eucalyptus groves in and around the Marsh, particularly those on Joice and Grizzly Islands, should not be disturbed.
Submerged Lands Act	The State of California owns tide and submerged lands waterward of the ordinary high watermark. State law gives primary responsibility for determination of the precise boundary between these public tidelands and private lands, and administrative responsibility over state tidelands, to the CSLC. Access and use of state shoreline

Land Use and Planning (State)	
	areas can be obtained through purchase or lease agreements. The Project area is currently operated in holdover status under agreement with the CSLC.
Other	<ul style="list-style-type: none"> • McAteer-Petris Act. (See Multiple Environmental Issues.) • Under California Code of Regulations, title 23, the Central Valley Flood Protection Board regulates specific river, creek, and slough crossings for flood protection: (1) new crossings must maintain hydraulic capacity through such measures as in-line piers, adequate stream bank height (freeboard), and measures to protect against stream bank and channel erosion, and (2) improvements, including crossings, must be constructed in a manner that does not reduce the channel's capacity or functionality, or that of any Federal flood control project.

MINERAL RESOURCES

Mineral Resources (Federal)	
CFR, Titles 10, 18, and 30	<ul style="list-style-type: none"> • 10 CFR addresses energy consumption and the Department of Energy. • 18 CFR addresses the Federal Energy Regulatory Commission (FERC). • 30 CFR establishes the Bureau of Ocean Energy Management (BOEM, formerly the MMS), which manages energy resources in the Federal OCS.

Mineral Resources (State)	
Surface Mining and Reclamation Act (SMARA) (Pub. Resources Code, §§ 2710-2796).	<p>The California Department of Conservation is the primary agency with regard to mineral resource protection. The Department, which is charged with conserving earth resources (Pub. Resources Code, §§ 600-690), has five program divisions: California Geological Survey (CGS); Division of Oil, Gas, and Geothermal Resources; Division of Land Resource Protection; State Mining and Geology Board (SMGB); and Office of Mine Reclamation. SMGB develops policy direction regarding the development and conservation of mineral resources and reclamation of mined lands. In accordance with SMARA, CGS classifies the regional significance of mineral resources and assists in designating lands containing significant aggregate resources. Four Mineral Resource Zones (MRZs) are designated to indicate the significance of mineral deposits.</p> <ul style="list-style-type: none"> • MRZ-1: Areas where adequate information indicates that no significant mineral deposits are present or where it is judged that little likelihood exists for their presence. • MRZ-2: Areas where adequate information indicates significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence. • MRZ-3: Areas containing mineral deposits the significance of which cannot be evaluated from available data. • MRZ-4: Areas where available information is inadequate for assignment to any other MRZ.
Other	<ul style="list-style-type: none"> • Warren-Alquist Act, adopted in 1974 to encourage conservation of non-renewable energy resources.

NOISE

Noise (Federal)	
Noise Control Act (42 USC 4910)	<p>This Act required the USEPA to establish noise emission criteria, as well as noise testing methods (40 CFR Chapter 1, Subpart Q). These criteria generally apply to interstate rail carriers and to some types of construction and transportation equipment. The USEPA published a guideline (USEPA 1974) containing recommendations for acceptable noise level limits affecting residential land use of 55 dBA L_{dn} for outdoors and 45 dBA L_{dn} for indoors.</p>

Noise (Federal)	
NTIS 550\9-74-004, 1974	In response to a Federal mandate, the USEPA provided guidance in NTIS 550\9-74-004, 1974 ("Information on Levels of Environmental Noise Requisite to Protect Health and Welfare with an Adequate Margin of Safety"), commonly referenced as the "Levels Document" that establishes an L_{dn} of 55 dBA as the requisite level, with an adequate margin of safety, for areas of outdoor uses including residences and recreation areas. The USEPA recommendations contain a factor of safety and do not consider technical or economic feasibility (i.e., the document identifies safe levels of environmental noise exposure without consideration for achieving these levels or other potentially relevant considerations), and therefore should not be construed as standards or regulations.
Other	<ul style="list-style-type: none"> • Department of Housing and Urban Development Environmental Standards (24 CFR Part 51) sets forth exterior noise standards for new home construction (includes an interior noise level goal of 45 dBA with attenuation requirements to meet that goal): <ul style="list-style-type: none"> ○ 65 L_{dn} or less – Acceptable ○ 65 L_{dn} and < 75 L_{dn} – Normally unacceptable, appropriate sound attenuation measures must be provided ○ > 75 L_{dn} – Unacceptable • The FERC Guidelines on Noise Emissions from Compressor Stations, Substations, and Transmission Lines (18 CFR 157.206(d)(5)) and Federal Highway Administration Noise Abatement Procedures (23 CFR Part 772) are procedures for noise studies and noise abatement measures to protect public health and welfare, supply noise abatement criteria, and establish requirements for information to be given to local officials for use in highway planning and design. It establishes five categories of noise-sensitive receptors and prescribes the use of the Hourly L_{eq} as the criterion metric to evaluate traffic noise impacts.

Noise (State)	
Land Use Compatibility Guidelines from the now defunct California Office of Noise Control	<p>State regulations for limiting population exposure to physically and/or psychologically significant noise levels include established guidelines and ordinances for roadway and aviation noise under Caltrans and the now defunct California Office of Noise Control. Office of Noise Control land use compatibility guidelines provided the following:</p> <ul style="list-style-type: none"> • For residences, an exterior noise level of 60 to 65 dBA Community Noise Equivalent Level (CNEL) is considered "normally acceptable;" a noise level of greater than 75 dBA CNEL is considered "clearly unacceptable." • A noise level of 70 dBA CNEL is considered "conditionally acceptable" (i.e., the upper limit of "normally acceptable" for sensitive uses [schools, libraries, hospitals, nursing homes, churches, parks, offices, commercial/professional businesses]).
Other	<ul style="list-style-type: none"> • California Administrative Code, title 2, establishes CNEL 45 dBA as the maximum allowable indoor noise level resulting from exterior noise sources for multi-family residences. • California Administrative Code, title 4, which applies to airports operating under permit from the Caltrans Division of Aeronautics, defines a noise-impacted zone as any residential or other noise-sensitive use with CNEL 65 and above.

POPULATION AND HOUSING

Population and Housing (Federal)
There are no major federal laws, regulations, and policies potentially applicable to this project

Population and Housing (State)
There are no major state laws, regulations, and policies potentially applicable to this project

PUBLIC SERVICES

Public Services (Federal)	
CFR Title 29	<ul style="list-style-type: none"> • Under 29 CFR 1910.38, whenever an Occupational Safety and Health Administration (OSHA) standard requires one, an employer must have an Emergency Action Plan that must be in writing, kept in the workplace, and available to employees for review. An employer with 10 or fewer employees may communicate the plan orally to employees. Minimum elements of an emergency action plan include the following procedures: Reporting a fire or other emergency; emergency evacuation, including type of evacuation and exit route assignments; employees who remain to operate critical plant operations before they evacuate; account for all employees after evacuation; and employees performing rescue or medical duties • Under 29 CFR 1910.39, an employer must have a Fire Prevention Plan (FPP). A FPP must be in writing, be kept in the workplace, and be made available to employees for review; an employer with 10 or fewer employees may communicate the plan orally to employees. • Under 29 CFR 1910.155, Subpart L, Fire Protection, employers are required to place and keep in proper working order fire safety equipment within facilities.

Public Services (State)	
California Code of Regulations, title 19 (Public Safety)	Under this section, the CSFM develops regulations relating to fire and life safety. These regulations have been prepared and adopted to establish minimum standards for the prevention of fire and for protection of life and property against fire, explosion, and panic. The CSFM also adopts and administers regulations and standards necessary under the California Health and Safety Code to protect life and property.

RECREATION

Recreation (Federal)	
There are no major federal laws, regulations, and policies potentially applicable to this project	

Recreation (State)	
Other	• McAteer-Petris Act. (See Multiple Environmental Issues.)

TRANSPORTATION / TRAFFIC

Transportation / Traffic (Federal)	
Hazardous Materials Transportation Act (HMTA) (49 USC 5901)	The HMTA delegates authority to the DOT to develop and implement regulations pertaining to the transport of hazardous materials and hazardous wastes by all modes of transportation. The USEPA's Hazardous Waste Manifest System is a set of forms, reports, and procedures for tracking hazardous waste from a generator's site to the disposal site. Applicable regulations are contained primarily in CFR Titles 40 and 49.
Ports and Waterways Safety Act	This Act provides the authority for the USCG to increase vessel safety and protect the marine environment in ports, harbors, waterfront areas, and navigable waters, including by authorizing the Vessel Traffic Service, controlling vessel movement, and establishing requirements for vessel operation.

Transportation / Traffic (State)	
California Vehicle Code	Chapter 2, article 3 defines the powers and duties of the California Highway Patrol, which enforces vehicle operation and highway use in the State.

Transportation / Traffic (State)	
Caltrans	Caltrans is responsible for the design, construction, maintenance, and operation of the California State Highway System and the portion of the Interstate Highway System within State boundaries. Chapter 2, article 3 of the Vehicle Code defines the powers and duties of the California Highway Patrol, which has enforcement responsibilities for the vehicle operation and highway use in the State.

UTILITIES AND SERVICE SYSTEMS

Utilities and Service Systems (Federal)	
CFR Title 29	See Public Services.

Utilities and Service Systems (State)	
There are no major state laws, regulations, and policies potentially applicable to this project	

SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

Socioeconomics and Environmental Justice (Federal)	
Executive Order (EO) 12898	In 1994, President Clinton issued an “Executive Order on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” (EO 12898). This EO was designed to focus attention on environmental and human health conditions in areas of high minority populations and low-income communities, and promote non-discrimination in programs and projects substantially affecting human health and the environment (White House 1994). The EO requires Federal agencies (as well as State agencies receiving Federal funds) to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

Socioeconomics and Environmental Justice (State)	
CSLC	In 2002, the CSLC adopted an Environmental Justice Policy to ensure consideration of environmental justice as part of the CSLC’s processes, decisions, and programs (Calendar Item 63, April 9, 2002). The policy stresses equitable treatment of all members of the public and commits to consider environmental justice in its processes, decision-making, and regulatory affairs. CSLC staff implements the Policy, in part, through identification of and communication with relevant populations that could be adversely and disproportionately affected by CSLC projects or programs, and by ensuring that a range of reasonable alternatives is identified that would minimize or eliminate environmental issues affecting such populations.
State of California Commercial Fishing Laws and Licensing Requirements	Commercial fishing is regulated by a series of laws passed by the State Fish and Game Commission and issued each year in a summary document. Seasonal and gear restrictions within the various Fish and Game Districts, licensing instructions and restrictions, and species-specific fishing requirements are provided in the document. Most of the MPAs have commercial fishing restrictions (based on the designation of each area), which are also listed in the summary document.

APPENDIX B

Equipment List and Air Emissions Calculation Methodologies

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Equipment Type (1)	Number of Pieces	Operating Hours per Day	Total Days of Use	Engine Type	Engine HP (2)	Load Factor (3)	Model Year (4)
Horizontal Directional Drill							
DRILL RIG 750,000 LB	1	10	22	Caterpillar 15.2L	630X2	50%	2015
DRILL RIG 160,000 LB	1	10	4		300	50%	2015
CAT POWER UNIT	1	10	22	Caterpillar 9.3L	173	50%	3011
R.T. CRANE- 50 TO 75 TON	1	8	30	Cummins 15L	275	50%	2015
BACKHOE- 420/430/C580	1	6	34	John Deere 4.5L	94	50%	2013
BACKHOE- 420/430/C580	1	6	26	John Deere 4.5L	124	50%	2012
FORKLIFT- 10,000# & OVER	1	4	22	Cummins 4.5L	130	25%	2014
FORKLIFT- 10,000# & OVER	1	8	4	Cummins 4.5L	130	25%	2014
R.T. CRANE- 25 TO 50 TON	1	10	4	Cummins 15L	275	50%	2012
MCS 756 MUD SYSTEM	1	10	4	John Deere 4.5L	433	50%	2015
MCS 1000 MUD SYSTEM	1	10	22		225/540	.75%/.75%	2008
TRIPLEX PUMP	1	6	12	Perkins 7.0L	700	50%	2008
EXCAVATOR- CAT 330 SIZE	1	6	13	Caterpillar 12.5L	316	50%	2012
3 AX WATER TRUCK 6X6	1	3	28	Cummins 11.9L	370	50%	2015
12 CY DUMP TRUCK	1	3	26	Cummins 8.9L	370	50%	2015
250 KW GENERATOR	1	10	4	Cummins 6.7L	433	50%	2015
GODWIN 6" PUMP	1	4	26	John Deere 4.5L	75	75%	2015
LIGHT TOWER	8	10	10	Kubota 3.77L	13.1	75%	2015
Pipeline							
PICKUP- 3/4 TON (4WD)	2	2	45	Ford 6.2L	316	25%	2015
VAN- 8 PASSENGER	3	2	45	Ford 6.2L	400	25%	2015
3 AX LOWBED TRACTOR	1	4	45	Cummins 14.9L	550	50%	2015
3 AX MATT HAULING TRACTOR	8	6	2	Cummins 14.9L	550	50%	2013
BACKHOE- 420/430/C580	1	6	10	John Deere 4.5L	94	50%	2013
RIDE ON COMPACTOR	1	8	10	Caterpillar 9.3L	46	50%	2007
3 AX WATER TRUCK 6X6	1	4	23	Cummins 11.9L	370	50%	2012
3 AX PIPE HAUL TRACTOR	10	4	1	Cummins 14.9L	550	50%	2015
1 TON WELD TRUCK	5	4	20	Ford 6.7L	400	50%	2015
WELD MACHINE- 200 AMP	5	10	20	Kubota 3.77L	495	50%	2015
R.T. CRANE- 50 TO 75 TON	1	6	20	Cummins 15L	275	50%	2015
PIPELAYER- 572 SIZE	1	6	10	Caterpillar 15.2L	249	50%	2013
1 TON FLATBED (4WD)	1	6	32	Ford 6.7L	400	50%	2015
AIR COMPRESSOR- 175 TO 475CFM	1	6	32	John Deere 4.5L	115	50%	2014
GODWIN 6" PUMP	1	24	4	John Deere 4.5L	75	75%	2015
PUMP- HYDRO/TEST	1	8	2	John Deere 4.5L	17.3	75%	2014
AIR COMP- 1500CFM	1	6	3	Komatsu 11L	580	50%	2015
Office							
PICKUP- 3/4 TON (4WD)	2	4	66	Ford 6.2L	316	25%	2015
GATOR 6X4 WORKSITE VEHICLE	2	4	66			50%	2015
250 KW GENERATOR	1	10	45	Cummins 6.7L	433	50%	2015
FORKLIFT- 10,000# & OVER	1	4	21	Cummins 4.5L	130	50%	2012
LIGHT TOWER	2	10	10	Kubota 3.77L	13.1	50%	2015
Dutra Group							
SPUD BARGE (196' LONG X 60' WIDE X 12' TALL) WITH RB 90 WINCHES	1	1	25		300	50%	2008
DERRICK BARGE (150' LONG X 54' WIDE X 12.5' TALL) WITH CLYDE DUTY CYCLE CRANE	1	10	5		500	50%	2008
MANITOWOC 4100 CRANE	1	6	25		500	30%	1990
TUG BOAT	1	8	7		1700	40%	2008
WORK BOAT	1	3	30		430	50%	2000
SKIFF	2	4	50		30	50%	2012
CREW BOAT	2	4	60		450	50%	2008
SURVEY BOAT	1	4	2		150	50%	2010
CAT D6 LGP DOZER	1	6	10		175	40%	1990
CAT D3 DOZER	1	6	15		62	40%	1988
CAT 966G WHEEL LOADER	1	6	10		235	40%	2004
CAT 140 BLADE	1	6	15		235	40%	2004
CAT 330 EXCAVATOR	1	6	15		270	40%	2013
TEN WHEEL DUMP TRUCK	14	6	15		380	50%	2010
WATER TRUCK	1	6	15		250	30%	2010
PICKUP - 3/4 TON	1	4	40		350	30%	2012
AIR COMPRESSOR - 185 CFM	1	6	40		60	50%	2010
GENERATOR - 175 KW	1	10	40		280	30%	2010
VIBRATORY HAMMER - APE 200	1	6	5		595	50%	2000

Mallard Farms HDD - Horizontal Directional Drill Bay Area AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	1.60	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	64
Climate Zone	4			Operational Year	2017
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Emissions from horizontal directional drill activities.

Land Use - Project-specific construction list used. Acreage based on North and South work areas.

Construction Phase - Project specific equipment list used. Calculations based on total equipment operating hours (modeled over a single day for calculation simulation).

Off-road Equipment - Project specific equipment list used. Calculations based on total equipment operating hours (modeled over a single day for calculation simulation).

Trips and VMT - Worker trips based on pieces of equipment and days of operation. Construction on-site truck activities modeled as vendor and hauling trips occurring 40 miles of travel per day.

Grading -

Energy Use -

Construction Off-road Equipment Mitigation - Project specific engine tiers used.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	4.00	1.00
tblLandUse	LotAcreage	0.00	1.60
tblOffRoadEquipment	HorsePower	97.00	94.00
tblOffRoadEquipment	HorsePower	97.00	124.00
tblOffRoadEquipment	HorsePower	205.00	630.00
tblOffRoadEquipment	HorsePower	205.00	300.00
tblOffRoadEquipment	HorsePower	226.00	275.00
tblOffRoadEquipment	HorsePower	226.00	275.00
tblOffRoadEquipment	HorsePower	162.00	316.00
tblOffRoadEquipment	HorsePower	89.00	130.00
tblOffRoadEquipment	HorsePower	89.00	130.00
tblOffRoadEquipment	HorsePower	84.00	173.00
tblOffRoadEquipment	HorsePower	84.00	433.00
tblOffRoadEquipment	HorsePower	84.00	433.00
tblOffRoadEquipment	HorsePower	84.00	225.00
tblOffRoadEquipment	HorsePower	84.00	540.00

tblOffRoadEquipment	HorsePower	84.00	700.00
tblOffRoadEquipment	HorsePower	84.00	75.00
tblOffRoadEquipment	HorsePower	6.00	13.00
tblOffRoadEquipment	LoadFactor	0.37	0.50
tblOffRoadEquipment	LoadFactor	0.37	0.50
tblOffRoadEquipment	LoadFactor	0.29	0.50
tblOffRoadEquipment	LoadFactor	0.29	0.50
tblOffRoadEquipment	LoadFactor	0.38	0.50
tblOffRoadEquipment	LoadFactor	0.20	0.25
tblOffRoadEquipment	LoadFactor	0.20	0.25
tblOffRoadEquipment	LoadFactor	0.74	0.50
tblOffRoadEquipment	LoadFactor	0.74	0.50
tblOffRoadEquipment	LoadFactor	0.74	0.50
tblOffRoadEquipment	LoadFactor	0.74	0.75
tblOffRoadEquipment	LoadFactor	0.74	0.75
tblOffRoadEquipment	LoadFactor	0.74	0.50
tblOffRoadEquipment	LoadFactor	0.74	0.75
tblOffRoadEquipment	LoadFactor	0.82	0.75
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	7.00	204.00
tblOffRoadEquipment	UsageHours	7.00	156.00
tblProjectCharacteristics	OperationalYear	2014	2017
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	40.00
tblTripsAndVMT	HaulingTripNumber	0.00	54.00
tblTripsAndVMT	WorkerTripNumber	63.00	932.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.1210	1.3753	0.7792	2.4800e-003	5.1400e-003	0.0503	0.0555	1.3700e-003	0.0480	0.0494	0.0000	231.5617	231.5617	0.0389	0.0000	232.3794
Total	0.1210	1.3753	0.7792	2.4800e-003	5.1400e-003	0.0503	0.0555	1.3700e-003	0.0480	0.0494	0.0000	231.5617	231.5617	0.0389	0.0000	232.3794

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.0442	0.6826	1.2063	2.4800e-003	5.1400e-003	0.0221	0.0272	1.3700e-003	0.0221	0.0235	0.0000	231.5614	231.5614	0.0389	0.0000	232.3792
Total	0.0442	0.6826	1.2063	2.4800e-003	5.1400e-003	0.0221	0.0272	1.3700e-003	0.0221	0.0235	0.0000	231.5614	231.5614	0.0389	0.0000	232.3792

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	63.50	50.37	-54.81	0.00	0.00	56.08	50.88	0.00	54.01	52.49	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Horizontal Directional Drill	Grading	1/1/2017	1/2/2017	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Horizontal Directional Drill	Bore/Drill Rigs	2	220.00	630	0.50
Horizontal Directional Drill	Bore/Drill Rigs	1	40.00	300	0.50
Horizontal Directional Drill	Cranes	1	240.00	275	0.50
Horizontal Directional Drill	Cranes	1	40.00	275	0.50
Horizontal Directional Drill	Excavators	1	78.00	316	0.50
Horizontal Directional Drill	Forklifts	1	88.00	130	0.25
Horizontal Directional Drill	Forklifts	1	32.00	130	0.25
Horizontal Directional Drill	Generator Sets	1	220.00	173	0.50
Horizontal Directional Drill	Generator Sets	1	40.00	433	0.50
Horizontal Directional Drill	Graders	0	0.00	174	0.41
Horizontal Directional Drill	Pumps	1	40.00	433	0.50
Horizontal Directional Drill	Pumps	1	220.00	225	0.75
Horizontal Directional Drill	Pumps	1	220.00	540	0.75

Horizontal Directional Drill	Pumps	1	72.00	700	0.50
Horizontal Directional Drill	Pumps	1	104.00	75	0.75
Horizontal Directional Drill	Rubber Tired Dozers	0	0.00	255	0.40
Horizontal Directional Drill	Signal Boards	8	100.00	13	0.75
Horizontal Directional Drill	Tractors/Loaders/Backhoes	1	204.00	94	0.50
Horizontal Directional Drill	Tractors/Loaders/Backhoes	1	156.00	124	0.50

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Horizontal Directional Drill	25	932.50	0.00	54.00	12.40	6.60	40.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Horizontal Directional Drill - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1186	1.3591	0.7488	2.3900e-003		0.0501	0.0501		0.0478	0.0478	0.0000	224.2707	224.2707	0.0387	0.0000	225.0839
Total	0.1186	1.3591	0.7488	2.3900e-003	0.0000	0.0501	0.0501	0.0000	0.0478	0.0478	0.0000	224.2707	224.2707	0.0387	0.0000	225.0839

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.9000e-004	0.0139	8.3800e-003	4.0000e-005	9.1000e-004	1.8000e-004	1.0900e-003	2.5000e-004	1.7000e-004	4.2000e-004	0.0000	3.5990	3.5990	3.0000e-005	0.0000	3.5996
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5700e-003	2.2900e-003	0.0221	5.0000e-005	4.2300e-003	3.0000e-005	4.2600e-003	1.1300e-003	3.0000e-005	1.1600e-003	0.0000	3.6920	3.6920	1.9000e-004	0.0000	3.6960
Total	2.4600e-003	0.0162	0.0305	9.0000e-005	5.1400e-003	2.1000e-004	5.3500e-003	1.3800e-003	2.0000e-004	1.5800e-003	0.0000	7.2910	7.2910	2.2000e-004	0.0000	7.2956

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0417	0.6664	1.1759	2.3900e-003		0.0219	0.0219		0.0219	0.0219	0.0000	224.2704	224.2704	0.0387	0.0000	225.0836
Total	0.0417	0.6664	1.1759	2.3900e-003	0.0000	0.0219	0.0219	0.0000	0.0219	0.0219	0.0000	224.2704	224.2704	0.0387	0.0000	225.0836

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	8.9000e-004	0.0139	8.3800e-003	4.0000e-005	9.1000e-004	1.8000e-004	1.0900e-003	2.5000e-004	1.7000e-004	4.2000e-004	0.0000	3.5990	3.5990	3.0000e-005	0.0000	3.5996
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5700e-003	2.2900e-003	0.0221	5.0000e-005	4.2300e-003	3.0000e-005	4.2600e-003	1.1300e-003	3.0000e-005	1.1600e-003	0.0000	3.6920	3.6920	1.9000e-004	0.0000	3.6960
Total	2.4600e-003	0.0162	0.0305	9.0000e-005	5.1400e-003	2.1000e-004	5.3500e-003	1.3800e-003	2.0000e-004	1.5800e-003	0.0000	7.2910	7.2910	2.2000e-004	0.0000	7.2956

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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Mitigated

	Natural Gas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000							

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					

Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			

User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Vegetation

Mallard Farms HDD - Pipeline Bay Area AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	1.60	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	64
Climate Zone	4			Operational Year	2017
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Emissions from pipeline activities.

Land Use - Project-specific construction list used. Acreage based on North and South work areas.

Construction Phase - Project specific equipment list used. Calculations based on total equipment operating hours (modeled over a single day for calculation simulation).

Off-road Equipment - Project specific equipment list used. Calculations based on total equipment operating hours (modeled over a single day for calculation simulation).

Trips and VMT - Worker trips based on pieces of equipment and days of operation. Construction on-site truck activities modeled as vendor and hauling trips occurring 40 miles of travel per day.

Grading -

Energy Use -

Construction Off-road Equipment Mitigation - Project specific engine tiers used.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	4.00	1.00
tblLandUse	LotAcreage	0.00	1.60
tblOffRoadEquipment	HorsePower	97.00	550.00
tblOffRoadEquipment	HorsePower	97.00	550.00
tblOffRoadEquipment	HorsePower	97.00	94.00
tblOffRoadEquipment	HorsePower	97.00	550.00
tblOffRoadEquipment	HorsePower	78.00	115.00
tblOffRoadEquipment	HorsePower	78.00	580.00
tblOffRoadEquipment	HorsePower	226.00	275.00
tblOffRoadEquipment	HorsePower	226.00	249.00
tblOffRoadEquipment	HorsePower	84.00	75.00
tblOffRoadEquipment	HorsePower	84.00	17.00
tblOffRoadEquipment	HorsePower	80.00	46.00
tblOffRoadEquipment	HorsePower	46.00	495.00
tblOffRoadEquipment	LoadFactor	0.37	0.50
tblOffRoadEquipment	LoadFactor	0.37	0.50
tblOffRoadEquipment	LoadFactor	0.37	0.50
tblOffRoadEquipment	LoadFactor	0.37	0.50
tblOffRoadEquipment	LoadFactor	0.48	0.50
tblOffRoadEquipment	LoadFactor	0.48	0.50

tblOffRoadEquipment	LoadFactor	0.29	0.50
tblOffRoadEquipment	LoadFactor	0.29	0.50
tblOffRoadEquipment	LoadFactor	0.74	0.75
tblOffRoadEquipment	LoadFactor	0.74	0.75
tblOffRoadEquipment	LoadFactor	0.38	0.50
tblOffRoadEquipment	LoadFactor	0.45	0.50
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	10.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	7.00	180.00
tblOffRoadEquipment	UsageHours	7.00	12.00
tblOffRoadEquipment	UsageHours	7.00	60.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblProjectCharacteristics	OperationalYear	2014	2017
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	40.00
tblTripsAndVMT	HaulingTripNumber	0.00	155.00
tblTripsAndVMT	VendorTripLength	6.60	40.00
tblTripsAndVMT	VendorTripNumber	0.00	225.00
tblTripsAndVMT	VendorVehicleClass	HDT_Mix	MHDT
tblTripsAndVMT	WorkerTripNumber	80.00	655.00

2.0 Emissions Summary

2.1 Overall Construction Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.1431	1.4553	0.6952	2.3800e-003	9.7000e-003	0.0536	0.0633	2.7300e-003	0.0517	0.0545	0.0000	232.8925	232.8925	0.0253	0.0000	233.4246
Total	0.1431	1.4553	0.6952	2.3800e-003	9.7000e-003	0.0536	0.0633	2.7300e-003	0.0517	0.0545	0.0000	232.8925	232.8925	0.0253	0.0000	233.4246

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.0561	0.6068	0.9900	2.3800e-003	9.7000e-003	0.0180	0.0277	2.7300e-003	0.0168	0.0195	0.0000	232.8923	232.8923	0.0253	0.0000	233.4243
Total	0.0561	0.6068	0.9900	2.3800e-003	9.7000e-003	0.0180	0.0277	2.7300e-003	0.0168	0.0195	0.0000	232.8923	232.8923	0.0253	0.0000	233.4243

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	60.81	58.30	-42.41	0.00	0.00	66.47	56.28	0.00	67.61	64.22	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	1.0000e-005	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005							

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Pipeline	Grading	1/1/2017	1/2/2017	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Pipeline	Air Compressors	1	192.00	115	0.50
Pipeline	Air Compressors	1	18.00	580	0.50
Pipeline	Cranes	1	120.00	275	0.50
Pipeline	Cranes	1	60.00	249	0.50
Pipeline	Graders	0	0.00	174	0.41
Pipeline	Pumps	1	96.00	75	0.75
Pipeline	Pumps	1	16.00	17	0.75
Pipeline	Rollers	1	80.00	46	0.50
Pipeline	Rubber Tired Dozers	0	0.00	255	0.40
Pipeline	Tractors/Loaders/Backhoes	1	180.00	550	0.50
Pipeline	Tractors/Loaders/Backhoes	8	12.00	550	0.50
Pipeline	Tractors/Loaders/Backhoes	1	60.00	94	0.50
Pipeline	Tractors/Loaders/Backhoes	10	4.00	550	0.50
Pipeline	Welders	5	200.00	495	0.50

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
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Pipeline	32	655.00	225.00	155.00	12.40	40.00	40.00	LD_Mix	MHDT	HHDT
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3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Pipeline - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1370	1.3811	0.6384	2.1200e-003		0.0522	0.0522		0.0505	0.0505	0.0000	210.3106	210.3106	0.0251	0.0000	210.8369
Total	0.1370	1.3811	0.6384	2.1200e-003	0.0000	0.0522	0.0522	0.0000	0.0505	0.0505	0.0000	210.3106	210.3106	0.0251	0.0000	210.8369

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.5400e-003	0.0399	0.0241	1.1000e-004	2.6100e-003	5.3000e-004	3.1400e-003	7.2000e-004	4.9000e-004	1.2000e-003	0.0000	10.3305	10.3305	7.0000e-005	0.0000	10.3321
Vendor	2.4000e-003	0.0327	0.0172	1.1000e-004	4.1200e-003	7.7000e-004	4.8900e-003	1.2300e-003	7.0000e-004	1.9300e-003	0.0000	9.6581	9.6581	7.0000e-005	0.0000	9.6595
Worker	1.1000e-003	1.6100e-003	0.0155	4.0000e-005	2.9700e-003	2.0000e-005	2.9900e-003	7.9000e-004	2.0000e-005	8.1000e-004	0.0000	2.5933	2.5933	1.4000e-004	0.0000	2.5961
Total	6.0400e-003	0.0742	0.0568	2.6000e-004	9.7000e-003	1.3200e-003	0.0110	2.7400e-003	1.2100e-003	3.9400e-003	0.0000	22.5819	22.5819	2.8000e-004	0.0000	22.5877

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0500	0.5326	0.9332	2.1200e-003		0.0166	0.0166		0.0155	0.0155	0.0000	210.3103	210.3103	0.0251	0.0000	210.8367
Total	0.0500	0.5326	0.9332	2.1200e-003	0.0000	0.0166	0.0166	0.0000	0.0155	0.0155	0.0000	210.3103	210.3103	0.0251	0.0000	210.8367

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.5400e-003	0.0399	0.0241	1.1000e-004	2.6100e-003	5.3000e-004	3.1400e-003	7.2000e-004	4.9000e-004	1.2000e-003	0.0000	10.3305	10.3305	7.0000e-005	0.0000	10.3321
Vendor	2.4000e-003	0.0327	0.0172	1.1000e-004	4.1200e-003	7.7000e-004	4.8900e-003	1.2300e-003	7.0000e-004	1.9300e-003	0.0000	9.6581	9.6581	7.0000e-005	0.0000	9.6595
Worker	1.1000e-003	1.6100e-003	0.0155	4.0000e-005	2.9700e-003	2.0000e-005	2.9900e-003	7.9000e-004	2.0000e-005	8.1000e-004	0.0000	2.5933	2.5933	1.4000e-004	0.0000	2.5961
Total	6.0400e-003	0.0742	0.0568	2.6000e-004	9.7000e-003	1.3200e-003	0.0110	2.7400e-003	1.2100e-003	3.9400e-003	0.0000	22.5819	22.5819	2.8000e-004	0.0000	22.5877

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.546114	0.062902	0.174648	0.122995	0.034055	0.004856	0.015640	0.024397	0.002087	0.003279	0.006673	0.000688	0.001667

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000							

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					

User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000							

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
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SubCategory	tons/yr									MT/yr						
	Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Vegetation

Mallard Farms HDD - Office Bay Area AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	1.60	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	64
Climate Zone	4			Operational Year	2017
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Emissions from construction office activities.

Land Use - Project-specific construction list used. Acreage based on North and South work areas.

Construction Phase - Project specific equipment list used. Calculations based on total equipment operating hours (modeled over a single day for calculation simulation).

Off-road Equipment - Project specific equipment list used. Calculations based on total equipment operating hours (modeled over a single day for calculation simulation).

Trips and VMT - Worker trips based on pieces of equipment and days of operation. Additional on-site light duty automobile activity modeled as worker trips.

Construction on-site truck activities modeled as worker and hauling trips, assuming 40 miles of travel per day.

Grading -

Energy Use -

Construction Off-road Equipment Mitigation - Project specific engine tiers used.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	4.00	1.00
tblLandUse	LotAcreage	0.00	1.60
tblOffRoadEquipment	HorsePower	89.00	130.00
tblOffRoadEquipment	HorsePower	84.00	433.00
tblOffRoadEquipment	HorsePower	6.00	13.00
tblOffRoadEquipment	LoadFactor	0.20	0.50
tblOffRoadEquipment	LoadFactor	0.74	0.50
tblOffRoadEquipment	LoadFactor	0.82	0.50
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblProjectCharacteristics	OperationalYear	2014	2017
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripLength	6.60	40.00
tblTripsAndVMT	VendorTripNumber	0.00	132.00
tblTripsAndVMT	VendorVehicleClass	HDT_Mix	MHDT
tblTripsAndVMT	WorkerTripNumber	10.00	479.00

2.0 Emissions Summary

2.1 Overall Construction Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.0303	0.3355	0.1597	6.7000e-004	4.5900e-003	0.0106	0.0152	1.3000e-003	0.0105	0.0118	0.0000	66.3888	66.3888	3.0000e-003	0.0000	66.4517
Total	0.0303	0.3355	0.1597	6.7000e-004	4.5900e-003	0.0106	0.0152	1.3000e-003	0.0105	0.0118	0.0000	66.3888	66.3888	3.0000e-003	0.0000	66.4517

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.0112	0.1718	0.3229	6.7000e-004	4.5900e-003	1.3700e-003	5.9700e-003	1.3000e-003	1.3400e-003	2.6300e-003	0.0000	66.3887	66.3887	3.0000e-003	0.0000	66.4516
Total	0.0112	0.1718	0.3229	6.7000e-004	4.5900e-003	1.3700e-003	5.9700e-003	1.3000e-003	1.3400e-003	2.6300e-003	0.0000	66.3887	66.3887	3.0000e-003	0.0000	66.4516

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	63.11	48.79	-102.18	0.00	0.00	87.11	60.78	0.00	87.18	77.62	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	1.0000e-005	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005							

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Office	Grading	1/1/2017	1/2/2017	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Office	Forklifts	1	84.00	130	0.50
Office	Generator Sets	1	450.00	433	0.50
Office	Graders	0	0.00	174	0.41
Office	Rubber Tired Dozers	0	0.00	255	0.40
Office	Signal Boards	2	100.00	13	0.50
Office	Tractors/Loaders/Backhoes	0	0.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Office	4	479.00	132.00	0.00	12.40	40.00	20.00	LD_Mix	MHDT	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Office - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0281	0.3152	0.1383	5.8000e-004		0.0102	0.0102		0.0100	0.0100	0.0000	58.8262	58.8262	2.8600e-003	0.0000	58.8863
Total	0.0281	0.3152	0.1383	5.8000e-004	0.0000	0.0102	0.0102	0.0000	0.0100	0.0100	0.0000	58.8262	58.8262	2.8600e-003	0.0000	58.8863

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.4100e-003	0.0192	0.0101	6.0000e-005	2.4200e-003	4.5000e-004	2.8700e-003	7.2000e-004	4.1000e-004	1.1300e-003	0.0000	5.6661	5.6661	4.0000e-005	0.0000	5.6669
Worker	8.1000e-004	1.1800e-003	0.0113	3.0000e-005	2.1700e-003	2.0000e-005	2.1900e-003	5.8000e-004	2.0000e-005	5.9000e-004	0.0000	1.8965	1.8965	1.0000e-004	0.0000	1.8986
Total	2.2200e-003	0.0203	0.0214	9.0000e-005	4.5900e-003	4.7000e-004	5.0600e-003	1.3000e-003	4.3000e-004	1.7200e-003	0.0000	7.5626	7.5626	1.4000e-004	0.0000	7.5654

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.3 Energy by Land Use - Electricity

Unmitigated

Category	tons/yr										MT/yr					
	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

6.2 Area by SubCategory

Unmitigated

SubCategory	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

Mitigated

SubCategory	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

Total	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
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7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
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Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Vegetation

Mallard Farms HDD - Dutra Group Bay Area AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	1.60	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	64
Climate Zone	4			Operational Year	2017
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Emissions from Dutra Group activities.

Land Use - Project-specific construction list used. Acreage based on North and South work areas.

Construction Phase - Project specific equipment list used. Calculations based on total equipment operating hours (modeled over a single day for calculation simulation).

Off-road Equipment - Project specific equipment list used. Calculations based on total equipment operating hours (modeled over a single day for calculation simulation).

Trips and VMT - Worker trips based on pieces of equipment and days of operation. Construction on-site truck activities modeled as vendor and hauling trips occurring 40 miles of travel per day.

Grading -

Energy Use -

Construction Off-road Equipment Mitigation - Project specific engine tiers used.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	4.00	1.00
tblLandUse	LotAcreage	0.00	1.60
tblOffRoadEquipment	HorsePower	174.00	235.00
tblOffRoadEquipment	HorsePower	255.00	175.00
tblOffRoadEquipment	HorsePower	97.00	235.00
tblOffRoadEquipment	HorsePower	78.00	60.00
tblOffRoadEquipment	HorsePower	226.00	500.00
tblOffRoadEquipment	HorsePower	162.00	270.00
tblOffRoadEquipment	HorsePower	84.00	280.00
tblOffRoadEquipment	HorsePower	84.00	595.00
tblOffRoadEquipment	HorsePower	199.00	62.00
tblOffRoadEquipment	LoadFactor	0.41	0.40
tblOffRoadEquipment	LoadFactor	0.37	0.40
tblOffRoadEquipment	LoadFactor	0.48	0.50
tblOffRoadEquipment	LoadFactor	0.29	0.30
tblOffRoadEquipment	LoadFactor	0.38	0.40
tblOffRoadEquipment	LoadFactor	0.74	0.30
tblOffRoadEquipment	LoadFactor	0.74	0.50
tblOffRoadEquipment	LoadFactor	0.36	0.40
tblOffRoadEquipment	UsageHours	6.00	90.00
tblOffRoadEquipment	UsageHours	6.00	60.00
tblOffRoadEquipment	UsageHours	7.00	60.00
tblProjectCharacteristics	OperationalYear	2014	2017
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	40.00
tblTripsAndVMT	HaulingTripNumber	0.00	225.00

tblTripsAndVMT	VendorTripLength	6.60	40.00
tblTripsAndVMT	VendorTripNumber	0.00	40.00
tblTripsAndVMT	VendorVehicleClass	HDT_Mix	MHDT
tblTripsAndVMT	WorkerTripNumber	23.00	437.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.0446	0.5124	0.2793	7.7000e-004	0.0321	0.0196	0.0517	0.0145	0.0186	0.0331	0.0000	73.0073	73.0073	9.5500e-003	0.0000	73.2079
Total	0.0446	0.5124	0.2793	7.7000e-004	0.0321	0.0196	0.0517	0.0145	0.0186	0.0331	0.0000	73.0073	73.0073	9.5500e-003	0.0000	73.2079

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.0395	0.4762	0.3088	7.7000e-004	0.0321	0.0177	0.0498	0.0145	0.0169	0.0315	0.0000	73.0073	73.0073	9.5500e-003	0.0000	73.2078
Total	0.0395	0.4762	0.3088	7.7000e-004	0.0321	0.0177	0.0498	0.0145	0.0169	0.0315	0.0000	73.0073	73.0073	9.5500e-003	0.0000	73.2078

Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	1.0000e-005	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005							

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Dutra Group	Grading	1/1/2017	1/2/2017	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Dutra Group	Air Compressors	1	240.00	60	0.50
Dutra Group	Cranes	1	150.00	500	0.30
Dutra Group	Excavators	1	90.00	270	0.40
Dutra Group	Generator Sets	1	400.00	280	0.30
Dutra Group	Generator Sets	1	30.00	595	0.50
Dutra Group	Graders	1	90.00	235	0.40
Dutra Group	Rubber Tired Dozers	1	60.00	175	0.40
Dutra Group	Rubber Tired Loaders	1	90.00	62	0.40

Dutra Group	Tractors/Loaders/Backhoes	1	60.00	235	0.40
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Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Dutra Group	9	437.50	40.00	225.00	12.40	40.00	40.00	LD_Mix	MHDT	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Dutra Group - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0256	0.0000	0.0256	0.0127	0.0000	0.0127	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0397	0.4476	0.2310	5.7000e-004		0.0187	0.0187		0.0177	0.0177	0.0000	54.5623	54.5623	9.3400e-003	0.0000	54.7584
Total	0.0397	0.4476	0.2310	5.7000e-004	0.0256	0.0187	0.0443	0.0127	0.0177	0.0305	0.0000	54.5623	54.5623	9.3400e-003	0.0000	54.7584

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.6900e-003	0.0580	0.0349	1.7000e-004	3.7900e-003	7.7000e-004	4.5500e-003	1.0400e-003	7.1000e-004	1.7500e-003	0.0000	14.9959	14.9959	1.0000e-004	0.0000	14.9981

Vendor	4.3000e-004	5.8100e-003	3.0600e-003	2.0000e-005	7.3000e-004	1.4000e-004	8.7000e-004	2.2000e-004	1.3000e-004	3.4000e-004	0.0000	1.7170	1.7170	1.0000e-005	0.0000	1.7172
Worker	7.4000e-004	1.0800e-003	0.0104	2.0000e-005	1.9800e-003	2.0000e-005	2.0000e-003	5.3000e-004	1.0000e-005	5.4000e-004	0.0000	1.7322	1.7322	9.0000e-005	0.0000	1.7341
Total	4.8600e-003	0.0649	0.0484	2.1000e-004	6.5000e-003	9.3000e-004	7.4200e-003	1.7900e-003	8.5000e-004	2.6300e-003	0.0000	18.4451	18.4451	2.0000e-004	0.0000	18.4494

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0256	0.0000	0.0256	0.0127	0.0000	0.0127	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0346	0.4114	0.2605	5.7000e-004		0.0168	0.0168		0.0161	0.0161	0.0000	54.5622	54.5622	9.3400e-003	0.0000	54.7584
Total	0.0346	0.4114	0.2605	5.7000e-004	0.0256	0.0168	0.0424	0.0127	0.0161	0.0288	0.0000	54.5622	54.5622	9.3400e-003	0.0000	54.7584

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.6900e-003	0.0580	0.0349	1.7000e-004	3.7900e-003	7.7000e-004	4.5500e-003	1.0400e-003	7.1000e-004	1.7500e-003	0.0000	14.9959	14.9959	1.0000e-004	0.0000	14.9981
Vendor	4.3000e-004	5.8100e-003	3.0600e-003	2.0000e-005	7.3000e-004	1.4000e-004	8.7000e-004	2.2000e-004	1.3000e-004	3.4000e-004	0.0000	1.7170	1.7170	1.0000e-005	0.0000	1.7172
Worker	7.4000e-004	1.0800e-003	0.0104	2.0000e-005	1.9800e-003	2.0000e-005	2.0000e-003	5.3000e-004	1.0000e-005	5.4000e-004	0.0000	1.7322	1.7322	9.0000e-005	0.0000	1.7341
Total	4.8600e-003	0.0649	0.0484	2.1000e-004	6.5000e-003	9.3000e-004	7.4200e-003	1.7900e-003	8.5000e-004	2.6300e-003	0.0000	18.4451	18.4451	2.0000e-004	0.0000	18.4494

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.546114	0.062902	0.174648	0.122995	0.034055	0.004856	0.015640	0.024397	0.002087	0.003279	0.006673	0.000688	0.001667

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000							

Mitigated

	Natural Gas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000							

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
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Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000

Unmitigated	0.0000	0.0000	0.0000	0.0000
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8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Vegetation

COMMERCIAL HARBOR CRAFT EMISSION INVENTORY

$E = EF0 \times F \times (1 + D \times A/UL) \times HP \times LF \times HR$

MAIN ENGINE EMISSIONS (tons)

Equipment Type (1)	Number of Pieces	Operating Hours per Day	Total Days of Use	Engine Type	Engine HP (2)	Load Factor (3)	Model Year (4)	Engine Tier (5)	Type	ROG	CO	NOx	PM	CO2 (metric tons)	CO2e (metric tons)
Dutra Group															
TUG BOAT	1	8	7		1700	0.4	2008	2	TUG	0.03	0.17	0.24	0.01	21.64	21.84
WORK BOAT	1	3	30		430	0.5	2000	0	WORK	0.02	0.05	0.18	0.01	11.00	11.10

FUEL CORRECTION FACTOR

Calendar Years	Horsepower Range	Model Years	ROG	CO	NOx	PM
1994-2006	<25 25-50 51-100 101-175 176+	Pre-1995 Pre-1999 Pre-1998 Pre-1997 Pre-1996	1.0	1.0	0.930	0.750
	<25 25-50 51-100 101-175 176+	1995+ 1999-2010 1998-2010 1997-2010 1996-2010	1.0	1.0	0.948	0.822
2007+	<25 25-50 51-100 101-175 176+	Pre-1995 Pre-1999 Pre-1998 Pre-1997 Pre-1996	1.0	1.0	0.930	0.720
	<25 25-50 51-100 101-175 176+	1995+ 1999-2010 1998-2010 1997-2010 1996-2010	1.0	1.0	0.948	0.800
	All	2011+	1.0	1.0	0.948	0.852

From OFFROAD Harborcraft Emissions Inventory Appendix B

DETERIORATION FACTOR

HP Range	HC	CO	NOx	PM
25-50	0.51	0.41	0.06	0.31
51-250	0.28	0.16	0.14	0.44
>251	0.44	0.25	0.21	0.67

From OFFROAD Harborcraft Emissions Inventory Appendix B

USEFUL LIFE

Vessel_Type	number of main	number auxilia	in Engine L	diary Engine	Annual Hours	Annual Hou	Main Engine Useful Life (years)	Auxiliary Engine Useful Life (years)
Tow Boats	2.1	1.17	0.68	0.43	1,993.00	2,964.62	26	25
Tug Boats	1.92	1.59	0.5	0.31	2,274.06	2,486.21	21	22.5
Ferries	2.01	1.23	0.42	0.43	1,842.64	1,254.17	20	20
Others	1.11	0.46	0.52	0.43	778.71	805.39	23	22
Work Boats	1.46	0.32	0.45	0.43	674.99	750.00	17	23
Pilot Vessels	1.7	0.14	0.51	0.43	1,030.71	994.00	19	25
Crew and Supply	2.5	1.1	0.45	0.43	787.52	3,035.80	22	22
Charter Fishing	1.77	0.75	0.52	0.43	1,622.28	2,077.00	16	15
Commercial Fishing	1.12	0.46	0.27	0.43	1,249.86	1,633.45	21	15

CO2 Emission Factor (g/hp-hr): 568.3

(From Barge and Dredge Inventory)

ZERO HOUR EMISSION FACTOR (g/hp-hr)

HP Range	Model Year	ME ROG	ME CO	ME NOx	ME PM	AE ROG	AE CO	AE NOx	AE PM	Fuel
- Implies 251-500 hp	2000	0.68	1.971	7.31	0.361	0.8092	2.781	7.31	0.3192	184.1585022
- Implies 751-1900 hp	2008	0.68	3.73	5.529	0.2	0.8092	3.73	5.529	0.2	184.1585022

CO2 to CO2e Conversion Factor

	CO2 g/gallon	CH4 g/gallon	N2O g/gallon	CO2e g/gallon	CO2e/CO2
Diesel Fuel	10210	0.58	0.26	10302	101%
GWP	1	25	298		

Sources:

The Climate Registry. 2013. 2013 Climate Registry Default Emission Factors. January 2, 2013.

The Climate Registry. 2014. General Reporting Protocol 2.0: Updates and Clarifications. June 30, 2014.

BARGE AND DREDGE EMISSIONS INVENTORY

$E = EF_0 \times F \times (1 + D \times A/UL) \times HP \times LF \times HR$

MAIN ENGINE EMISSIONS (tons)															
Equipment Type (1)	Number of Pieces	Operating Hours per Day	Total Days of Use	Engine Type	Engine HP (2)	Load Factor (3)	Model Year (4)	Engine Tier (5)	Type	ROG	CO	NOx	PM	CO2 (metric tons)	CO2e (metric tons)
Dutra Group															
SPUD BARGE (196' LONG)	1	1	25		300	0.5	2008		3 BARGE	0.001	0.004	0.017	0.000	2.131	2.150
DERRICK BARGE (150' LONG)	1	10	5		500	0.5	2008		2 BARGE	0.002	0.014	0.058	0.002	7.104	7.168

FUEL CORRECTION FACTOR

Calendar Years	Horsepower Range	Model Years	ROG	CO	NOx	PM
1994-2006	<25	Pre-1995				
	25-50	Pre-1999				
	51-100	Pre-1998	1.0	1.0	0.930	0.750
	101-175	Pre-1997				
2007+	176+	Pre-1996				
	<25	1995+				
	25-50	1999-2010	1.0	1.0	0.948	0.822
	51-100	1998-2010				
2007+	101-175	1997-2010				
	176+	1996-2010				
	<25	Pre-1995				
	25-50	Pre-1999	1.0	1.0	0.930	0.720
2007+	51-100	Pre-1998				
	101-175	Pre-1997				
	176+	Pre-1996				
	<25	1995+				
2007+	25-50	1999-2010	1.0	1.0	0.948	0.800
	51-100	1998-2010				
	101-175	1997-2010				
	176+	1996-2010				
2007+	All	2011+	1.0	1.0	0.948	0.852

From OFFROAD Harborcraft Emissions Inventory Appendix B

DETERIORATION FACTOR

HP Group	HP Range	ROG	CO	NOX	PM
1	0-15	0.51	0.41	0.06	0.31
2	15-25	0.51	0.41	0.06	0.31
3	25-50	0.51	0.41	0.06	0.31
4	51-120	0.28	0.16	0.14	0.44
5	121-175	0.28	0.16	0.14	0.44
6	176-250	0.28	0.16	0.14	0.44
7	251-500	0.44	0.25	0.21	0.67
8	501-750	0.44	0.25	0.21	0.67
9	>751	0.44	0.25	0.21	0.67
10	>751	0.44	0.25	0.21	0.67

USEFUL LIFE

Vessel Type	Ves	ME Load	AE Load	ME Useful Life	AE Useful Life
Compressor	Compressor		0.54		19.5
Crane	Crane		0.42		9
Deck_door_engine	Deck_door_engine		0.89		16
Dredger	Dredger		0.51		16
Generator	Generator		0.75		22.5
Hoist_swing_winch	Hoist_swing_winch		0.31		27
Other	Other		0.80		16
Pump	Pump		0.71		21
propulsion	propulsion	0.45		17	

CO2 Emission Factor (g/hp) 568.3

ZERO HOUR EMISSION FACTOR (g/hp-hr)

HP Range	Model Year	ME ROG	ME CO	ME NOx	ME PM	AE ROG	AE CO	AE NOx	AE PM	Fuel	CO2
250<HP<=500	2008	0.12	0.92	4.00	0.11	0.12	0.92	4.00	0.11	185.97	568.30

CO2 to CO2e Conversion Factor

	CO2 g/gallon	CH4 g/gallon	N2O g/gallon	CO2e g/gallon	CO2e/CO2
Diesel Fuel	10210	0.58	0.26	10302	101%
GWP	1	25	298		

Sources:
 The Climate Registry. 2013. 2013 Climate Registry Default Emission Factors. January 2, 2013.
 The Climate Registry. 2014. General Reporting Protocol 2.0: Updates and Clarifications. June 30, 2014.

CREW AND SUPPLY EMISSION INVENTORY

$E = EF_0 \times F \times (1 + D \times A/U/L) \times HP \times LF \times HR$

MAIN ENGINE EMISSIONS (tons)

Equipment Type (1)	Number of Pieces	Operating Hours per Day	Total Days of Use	Engine Type	Engine HP (2)	Load Factor (3)	Model Year (4)	Engine Tier (5)	Type	ROG	CO	NOx	PM	CO2 (metric tons)	CO2e (metric tons)
Dutra Group															
SKIFF	2	4	50		30	0.5	2012		0 SKIFF	0.02	0.03	0.03	0.00	3.41	3.44
CREW BOAT	2	4	60		450	0.5	2008		0 CREW	0.11	0.48	0.61	0.02	61.38	61.93
SURVEY BOAT	1	4	2		150	0.5	2010		0 SURVEY	0.00	0.00	0.00	0.00	0.34	0.34

FUEL CORRECTION FACTOR

Calendar Years	Horsepower Range	Model Years	ROG	CO	NOx	PM
1994-2006	<25	Pre-1995	1.0	1.0	0.930	0.750
	25-50	Pre-1999				
	51-100	Pre-1998				
	101-175	Pre-1997				
	176+	Pre-1996				
2007+	<25	1995+	1.0	1.0	0.948	0.822
	25-50	1999-2010				
	51-100	1998-2010				
	101-175	1997-2010				
	176+	1996-2010				
2007+	<25	Pre-1995	1.0	1.0	0.930	0.720
	25-50	Pre-1999				
	51-100	Pre-1998				
	101-175	Pre-1997				
	176+	Pre-1996				
	<25	1995+	1.0	1.0	0.948	0.800
	25-50	1999-2010				
	51-100	1998-2010				
	101-175	1997-2010				
	176+	1996-2010				
	All	2011+	1.0	1.0	0.948	0.852

From OFFROAD Harborcraft Emissions Inventory Appendix B

DETERIORATION FACTOR

HP Group	HP Range	ROG	CO	NOX	PM
1	25-50	0.51	0.41	0.06	0.31
2	51-120	0.28	0.16	0.14	0.44
3	121-175	0.28	0.16	0.14	0.44
4	176-250	0.28	0.16	0.14	0.44
5	251-500	0.44	0.25	0.21	0.67
6	501-750	0.44	0.25	0.21	0.67
7	>751	0.44	0.25	0.21	0.67
8	>751	0.44	0.25	0.21	0.67
9	>751	0.44	0.25	0.21	0.67

USEFUL LIFE

Vessel Type	Ves	ME Load	E Useful Li	AE Load	AE Useful Life
Commercial Fishing	COF	0.27	21	0.43	15
Charter Fishing	CHF	0.52	16	0.43	15
Ferries	FRY	0.42	20	0.43	20
Crew and Supply	CNS	0.38	28	0.32	28
Pilot Vessels	POV	0.51	19	0.43	25
Tug Boats	TUG	0.50	21	0.31	22.5
Tow Boats	TOW	0.68	26	0.43	25
Work Boats	WBT	0.45	17	0.43	23
Others	OTS	0.52	23	0.43	22

CO2 Emission Factor (g/h) 568.3

(From Barge and Dredge Inventory)

ZERO HOUR EMISSION FACTOR (g/hp-hr)

HP Range	Model Year	ME ROG	ME CO	ME NOx	ME PM	AE ROG	AE CO	AE NOx	AE PM	Fuel
- Implies 25-50 hp	2012	2.18	3.73	5.32	0.22	2.59	3.73	5.32	0.22	184.16
- Implies 121-175 hp	2010	0.82	3.73	5.10	0.22	0.98	3.73	5.10	0.22	184.16
- Implies 251-500 hp	2008	0.82	3.73	5.10	0.15	0.98	3.73	5.10	0.15	184.16

CO2 to CO2e Conversion Factor

	CO2 g/gallon	CH4 g/gallon	N2O g/gallon	CO2e g/gallon	CO2e/CO2
Diesel Fuel	10210	0.58	0.26	10302	101%
GWP	1	25	298		

Sources:

The Climate Registry. 2013. 2013 Climate Registry Default Emission Factors. January 2, 2013.

The Climate Registry. 2014. General Reporting Protocol 2.0: Updates and Clarifications. June 30, 2014.

APPENDIX C

Plants and Wildlife Observed During Site Visits

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Appendix C Table 1. Plant Species Observed during Site Visits

Scientific Name	Common Name	Family	Native to California	Cal-IPC Status	Wetland Indicator Status
<i>Ambrosia psilostachya</i>	western ragweed	Asteraceae	yes	NA	FACU
<i>Artemisia douglasiana</i>	California mugwort	Asteraceae	yes	NA	FAC
<i>Asparagus officinalis</i>	garden asparagus	Asparagaceae	no	NA	FACU
<i>Atriplex prostrata</i>	fat-hen	Chenopodiaceae	no	NA	FACW
<i>Atriplex semibaccata</i>	Australian saltbush	Chenopodiaceae	no	Moderate	FAC
<i>Avena barbata</i>	slender wild oats	Poaceae	no	Moderate	NA
<i>Baccharis glutinosa</i>	salt marsh baccharis	Asteraceae	yes	NA	FACW?
<i>Baccharis pilularis</i>	coyote brush	Asteraceae	yes	NA	NA
<i>Bidens laevis</i>	burr marigold	Asteraceae	yes	NA	OBL
<i>Bolboschoenus maritimus subsp. paludosus</i>	saltmarsh bulrush	Cyperaceae	yes	NA	OBL
<i>Centaurea solstitialis</i>	yellow starthistle	Asteraceae	no	High	NA
<i>Cirsium vulgare</i>	bull thistle	Asteraceae	no	Moderate	FACU
<i>Conium maculatum</i>	poison hemlock	Apiaceae	no	Moderate	FACW
<i>Convolvulus arvensis</i>	field bindweed	Convolvulaceae	no	NA	NA
<i>Cotula coronopifolia</i>	brass buttons	Asteraceae	no	Limited	OBL
<i>Distichlis spicata</i>	coastal salt grass	Poaceae	yes	NA	FAC
<i>Dittrichia graveolens</i>	stinkwort	Asteraceae	no	Moderate	NA
<i>Equisetum sp.</i>	horsetail	Equisetaceae	yes	NA	FACW
<i>Euthamia occidentalis</i>	western goldenrod	Asteraceae	yes	NA	FACW
<i>Festuca perennis</i>	Italian rye grass	Poaceae	no	Moderate	NA
<i>Foeniculum vulgare</i>	fennel	Apiaceae	no	High	NA
<i>Frankenia salina</i>	alkali heath	Frankeniaceae	yes	NA	FACW
<i>Grindelia stricta</i>	gumweed	Asteraceae	yes	NA	FACW
<i>Helminthotheca echioides</i>	bristly ox-tongue	Asteraceae	no	Limited	FACU
<i>Hordeum marinum</i>	seaside barley	Poaceae	no	Moderate	FAC
<i>Isolepis cernua</i>	low bulrush	Cyperaceae	yes	NA	OBL

Appendix C Table 1. Plant Species Observed during Site Visits

Scientific Name	Common Name	Family	Native to California	Cal-IPC Status	Wetland Indicator Status
<i>Juncus effusus</i>	common rush	Juncaceae	yes	NA	FACW
<i>Juncus mexicanus</i>	Mexican rush	Juncaceae	yes	NA	FACW
<i>Lactuca serriola</i>	prickly lettuce	Asteraceae	no	NA	FACU
<i>Lepidium latifolium</i>	broadleaved pepperweed	Brassicaceae	no	High	FAC
<i>Lotus corniculatus</i>	birdsfoot trefoil	Fabaceae	no	NA	FAC
<i>Malvella leprosa</i>	alkali mallow	Malvaceae	yes	NA	FACU
<i>Melilotus indicus</i>	annual yellow sweetclover	Fabaceae	no	NA	FACU
<i>Phragmites australis</i>	common reed	Poaceae	yes	Limited	FACW
<i>Plantago maritima</i>	alkali plantain	Plantaginaceae	yes	NA	FACW
<i>Pluchea odorata</i>	salt marsh fleabane	Asteraceae	yes	NA	FACW
<i>Polygonum aviculare</i>	prostrate knotweed	Polygonaceae	no	NA	FACW
<i>Polypogon monspeliensis</i>	rabbitsfoot grass	Poaceae	no	Limited	FACW
<i>Potentilla anserina</i>	silver weed cinquefoil	Rosaceae	yes	NA	OBL
<i>Pseudognaphalium stramineum</i>	cotton-balling plant	Asteraceae	yes	NA	FAC
<i>Quercus lobata</i>	valley oak	Fagaceae	yes	NA	FACU
<i>Raphanus sativus</i>	wild radish	Brassicaceae	no	Limited	NA
<i>Rosa californica</i>	California rose	Rosaceae	yes	NA	FAC
<i>Rubus ursinus</i>	California blackberry	Rosaceae	yes	NA	FAC
<i>Rumex crispus</i>	curly dock	Polygonaceae	no	Limited	FAC
<i>Salicornia pacifica</i>	pickleweed	Chenopodiaceae	yes	NA	OBL
<i>Salsola soda</i>	alkali Russian thistle	Chenopodiaceae	no	Moderate	FACW
<i>Schoenoplectus acutus var. occidentalis</i>	common tule	Cyperaceae	yes	NA	OBL
<i>Sesuvium verrucosum</i>	western sea-purslane	Aizoaceae	yes	NA	FACW

Appendix C Table 1. Plant Species Observed during Site Visits

Scientific Name	Common Name	Family	Native to California	Cal-IPC Status	Wetland Indicator Status
<i>Silybum marianum</i>	milk thistle	Asteraceae	no	Limited	NA
<i>Sonchus asper</i>	spiny sowthistle	Asteraceae	no	NA	FAC
<i>Spartina sp.</i>	cord grass	Poaceae	no	S. densiflora possible hybrid	OBL
<i>Spergularia macrotheca</i>	perennial salt sand spurry	Carophyllaceae	yes	NA	OBL
<i>Spergularia marina</i>	annual salt sand spurry	Carophyllaceae	yes	NA	OBL
<i>Trichostema lanceolatum</i>	vinegarweed	Lamiaceae	yes	NA	NA
<i>Typha latifolia</i>	broadleaf cattail	Typhaceae	yes	NA	OBL

Appendix C Table 2. Wildlife Species Observed during Site Visits

Scientific Name	Common Name
<i>Agelaius phoeniceus</i>	Red-winged black bird
<i>Anas platyrhynchos</i>	Mallard
<i>Ardea alba</i>	Great egret
<i>Buteo jamaicensis</i>	Red-tailed hawk
<i>Buteo lineatus</i>	Red-shouldered hawk
<i>Bucephala albeola</i>	Green heron
<i>Fulica americana</i>	coot
<i>Buteo swainsoni</i>	Swainson's hawk
<i>Butorides virescens</i>	Bufflehead
<i>Cathartes aura</i>	Turkey Vulture
<i>Cervus elaphus nannodes</i>	Tule elk
<i>Circus cyaneus</i>	Northern harrier
<i>Cistothorus palustris</i>	Marsh wren
<i>Cygnus olor</i>	Mute swan
<i>Elanus leucurus</i>	White-tailed kite
<i>Egretta thula</i>	Snowy egret
<i>Euphagus cyanocephalus</i>	Brewer's blackbird
<i>Hirundo rustica</i>	Barn Swallow
<i>Laridae</i>	Gull Sp.
<i>Lontra canadensis</i>	River otter
<i>Marmotini</i>	Ground squirrel
<i>Melospiza melodia</i>	Song Sparrow
<i>Molothrus ater</i>	Brown headed cowbird

Appendix C Table 2. Wildlife Species Observed during Site Visits

Scientific Name	Common Name
<i>Phalacrocorax auritus</i>	Double-crested cormorant
<i>Sayornis nigricans</i>	Black Phoebe
<i>Troglodytidae</i>	Wren
Not identified to species	swallows

APPENDIX D

Draft Contingency Plan for Inadvertent Return of
Non-Hazardous Drilling Fluid

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Contingency Plan For Inadvertent Return of Non-Hazardous Drilling Fluid

I. DRILLING FLUID PLAN

Essential to any successful HDD process is the selection and proper utilization of drilling fluid which is made up of primarily water and bentonite (de-hydrated clay) having pH values between 8 and 10. Bentonite is a naturally occurring, non-toxic, inert substance that meets NSF/ANSI-60 Drinking Water Additive Standards and is frequently used for drilling potable water wells.

Therefore, the ecological and environmental impacts of an inadvertent return of drilling fluid into a water body is a temporary increase in local turbidity until the drilling fluid dissipates with the water current or settles out.

Bentonite serves many notable purposes in the HDD process, which includes but is not limited to:

- 1) Cleans the drilled cuttings from the bore hole and cools the drilling tools,
- 2) Transports cuttings to the surface for recycling,
- 3) Aids in stabilizing formations by supplying a cohesive nature to the surrounding geological formation and preventing fluid loss from the bore hole,
- 4) Provides lubrication for the drill string and downhole assembly, which reduces friction forces at the formation,
- 5) Drives a down-hole drill motor for rock drilling,
- 6) Provides hydrostatic fluid pressure in the bore hole to offset ground formation pressures.

Drilling fluid is composed of a carrier fluid and solids. The selected carrier fluid for this crossing consists of water (approximately 96%) and an inorganic, bentonite clay (approximately 4%). The driller has access to several different brands of bentonite. The selection of which brand to use is typically based on price, availability and proximity to the proposed drill site. The following brands all have similar characteristics providing the same results as listed above.

ATTACHMENT

Potential Bentonite Brands - MSDS

- Max Gel
- Super-Gel X
- Bara-Kade

The bentonite will be mixed in a mud mixing tank of up to 5,000 gallons, depending on mud rig size, in accordance with manufacturer's recommendation. Approximately 15 to 20 pounds of powder bentonite will be mixed with 100 gallons of water (*Mud Composition*), and will be used throughout the entire drilling process to establish and maintain optimum drilling fluid properties. The driller will maintain fluid performance through the daily sampling, testing and recording of fluid properties during drilling operations. This provides the Mud Technician the information to make educated recommendations regarding maintenance of efficient drilling fluid rheology consistent with hole-stabilization and the limiting of inadvertent surface returns. Following is one of the tables used as a guideline by the Mud Technician referencing recommended fluid

consistencies targeted during typical testing. Consistencies of powder and water are varied to achieve these recommended viscosities.

Targeted Drilling Fluid Viscosities Recommended	
Sand	60-80 Viscosity
Silt	50-70 Viscosity
Clay	40-50 Viscosity
Rock	60-80 Viscosity
Gravel	70-90 Viscosity

Once the drilling fluid is thoroughly mixed to an acceptable consistency, it is pumped from the mud tank to the back end of the drill rig. From here it is injected under high pressure through the drill stem at a rate of between 300 to 800 gpm to the apex of the drill head. The spent drill fluid with mixed cuttings maintains a return flow back along the annular space created between the drill stem and the formation wall. Drill fluid returns to the entry pit where it is pumped by a 6hp submersible pump to the fluid recycle and processing system.

The first phase of the fluid processing system displaces solid returns at the shakers. Heavy solids are sifted out by a shaker with screens and deposited into a containment pit, from where they will be transported by dump truck to a site for disposal. The scalped cuttings containing medium fines and re-useable drilling fluid are pumped to the next phase of processing, which takes place at the desilter/mud cleaning unit. The heavier cuttings are again processed out for disposal while the recycled drilling fluid is pumped back and re-used in the drilling process.

If the driller does not foresee the need for additives; however, additives may be deemed necessary based on evaluations and recommendations made by the Mud Technician during drilling and hole-opening operations. If the need for drill fluid additives does arise, it is anticipated that one of the following additives may be required in order to maintain adequate fluid rheology down-hole:

ATTACHMENT - Potential Additives or Equal

Brand	Purpose	Environmental Effect If Spilled
Suspend-IT	Used in Rock Formation - Increase Gel Strength	Non-Toxic / Non-Hazardous
Drill_Terge	Used in Clay Formation – Prevents Clay Balling and Swelling	Non-Toxic / Non-Hazardous
InstaVis Plus	Used in Clay Formation – Improves Viscosity	Non-Toxic / Non-Hazardous
Rel-Pac Xtra Low	Used in Sand & Cobble - Control Fluid Loss	Non-Toxic / Non-Hazardous
Soda Ash	Increase Ph in Make-up Water	Non-Toxic / Non-Hazardous

II. PREVENTION - CONTAINMENT – COMMUNICATION - CONTROL

Prevention

Best management practices are utilized for spill prevention, containment and control. Containment of drilling fluids will be attained through various precautions implemented prior to positioning the major pieces of equipment on the proposed sites. Configuration considerations are made for site geology, topography, and storm water management and erosion control.

Preventative training is conducted periodically; drilling personnel are required to undergo pre-construction training to discuss preemptive measures and early response procedures and techniques specific to this project as identified below. This training introduces drilling personnel to the appropriate chain of communication leading up to suspending of drilling operations should that action become necessary.

The following topics will be addressed during the training session:

- Preventative Methods to Invoke Prior to and During Construction;
- Details of the Spill Plan and Inadvertent Return Contingency Plan;
- Environmental Protection;
- Mitigative Resources Available at the site for Environmental Protection;
- Site Specific Permit Conditions;
- Monitoring of HDD operations (Recognize the Potential Areas of Inadvertent Return);
- Chain of Authority and Responsibility;
- Chain of Communication;
- List of Contact names and phone numbers of governing agencies to be posted;
- Incidents that must be reported and the person to report them to,

Drilling personnel are trained in the safe handling and use of drill fluids and materials associated with directional drilling. Every drill project has a designated supervisory person responsible for implementation and execution of environmental policy, safety monitoring and reports, and implementation of mitigation plans. The Project Supervisor is well-versed in the written procedures and policy maintained and is responsible for carrying them out.

Depending on the topography, the drill site is generally graded flat over an area the size and configuration of which will accommodate the drill rig and ancillary equipment. The grade of the work area aids in preventing rapid runoff and provides a safe and level work area. Grading may also be required at the drill exit location depending on the equipment required for the installation. Drilling fluid supplied for the project is stored on-site in an area of safe containment. Containment barriers are positioned at various pieces of drilling equipment in the unlikely event of a spill during re-fueling, lubrication or equipment operation. Consistent monitoring is employed by personnel during handling, storage and transportation of fuels and lubricating oils.

At the entrance site, a pit is excavated to the approximate dimensions of 6'L x 6'W x 4'D for containment and processing of drilling returns. The exit sump pit will also be excavated to the approximate dimensions of 6'L x 6'W x 4'D to contain drilling fluids for re-cycle and re-circulation into the mud system.

Prevention of accidental spills of drilling fluid during HDD operations in the following areas is accomplished by the following actions. The responsible person follows proper protocol and established procedures for their particular job assignment:

Area of Potential Spill	Personnel	Preventative Action
Mud Containment Pits: <i>Potential Overflow -</i> Located at excavated entry & exit areas.	Driller: Closely monitor fluid returns in the drill entry pit in view of the drill survey trailer to maintain appropriate levels.	Response: Contain Area. If fluid level becomes high, run pump continuously in pit until safe level is achieved. Add multiple pumps if required.
Hoses: <i>Possible Leaks -</i> At the connection between tanks & sump pumps.	Mud Technician: Inspects hose connections every day for leaks & wear, maintains a full stock of replacement parts in the supply trailer.	Response: Contain Area. Repair leaks and replace worn out hoses and parts.
Containment Tanks: <i>Potential Overflow or Leak -</i> Soil separation, cutting containment and solids control tanks.	Mud Technician: Continuously observes & controls fluid levels & flow from a birds-eye view located on top deck of mud mixing/soil separation rig.	Response: Contain Area. If solid control tanks reach overflow point, pump down to manageable level. May have to pump excess fluid/cuttings to vac truck or other storage tank. Maintain exterior valves.
Frac Tanks: <i>Potential Overflow or Leak -</i> At temporary holding tank for drill cuttings and fluids. At exterior valve location	Mud Technician: Continuously observe levels and flow from a birds-eye view located on top deck of mud mixing/soil separation rig.	Response: Contain Area. If solid control tanks reach overflow point, pump down to manageable level. May have to pump excess fluid/cuttings to vac truck or other storage tank. Maintain exterior valves.
Vac Trucks/Dump Trucks: <i>Possible Leak or Release-</i> At valve location or worn hose.	Vac Truck Driver: Maintain equipment in proper working order and follow specific guidelines in operation of vacuum and valves.	Response: Contain Area. If solid control tanks reach overflow point, pump down to manageable level. May have to pump excess fluid/cuttings to vac truck

Note: All drilling personnel are trained in awareness of surroundings for observing and mitigating potential problems with equipment in the effort to avoid spills.

Containment

One of the main components in the containment and control of surface discharge is employee's early detection and quick response. Drilling personnel follow an established monitoring procedure listed in the accompanying text, which will be invoked by the

Drilling Superintendent in the event drilling fluid is being noticeably lost from the bore-hole. Technology and mitigative efforts employed by the driller will be the most current and accepted methods in the industry today (BACT). They take into account both personnel safety and preservation of the environment.

The driller will use an environmentally safe drilling fluid and drilling techniques that are proven to minimize the potential for adverse impact due to installation by directional drilling. The only potentially negative impact that directional drilling could have on the environment would be the inadvertent loss of drilling fluid from the bore-hole and its subsequent migration into sensitive areas. Such losses generally occur due to extreme porosity of the subsurface strata combined with gravitational and frictional forces that become greater than the ability of the drill fluid to return uphole to the excavated entry/exit pit. The use of conductor casing for the longer crossings helps eliminate the chance of the hole plugging off near the surface.

The use of drilling fluid is essential for successful completion of the drilled crossing; there is no alternative. Implementing Prevention, Containment and Control procedures will ensure that every effort will be made within the limitations of available construction technology to prevent or react to a spill or inadvertent loss of drilling fluid with full intention of minimizing adverse environmental impact.

Loss of drilling returns is a common occurrence during drilling operations. It does not necessarily indicate that the drilling fluid is being inadvertently returned to the surface or impacting the environment.

Communication Plan

Project contacts are as follows:

Contacts	Phone No.	Affiliation
Drilling Contractor <i>On-Site Representative</i> TBD Assistant Ops Manager		
Drilling Contractor <i>On-Site Representative</i> TBD Drill Superintendent-HDD RIG#1		
Drilling Contractor <i>On-Site Representative</i> TBD Drill Superintendent-HDD RIG#2 (If Needed)		
Drilling Contractor <i>Off-Site Representative</i> Tim McGuire Vice President - HDD Division		

1. In case of emergency, the driller will notify the on-site inspector who will invoke the communication plan in the following manner: The representative chain of communication is as follows;

Contacts	Phone No.	Affiliation
After Hours Contact		

2. The Owner's Field Representative will contact the following Organizations as needed;

Contacts	Phone No.	Affiliation

Also, as applicable, the following agencies may be notified in the event this contingency plan is implemented: Regional Water Quality Control Board (RWQCB), US Army Corps of Engineers (ACOE), US Fish and Wildlife Service (USF&WS), and other entities as appropriate (local fire department, Highway Patrol, Rail Road, etc.)

Inadvertent Return Response & Control

The absence of an open bore-hole conduit or the presence of a major formation fracture can lead to partial and potentially total loss of drilling fluid circulation. While it is impossible to determine the precise nature of this type of fluid loss, it is possible to accurately monitor for it by watching for a significant difference between the rates the fluid is being pumped down-hole and the rate it returns to the surface. The drilling fluid pumping rate and the rate of drilling fluid return to the surface is constantly monitored by the driller while the drilling is progressing. The driller will know immediately if an unusually high volume of drilling fluid is being lost down-hole, depending on the ground conditions encountered in the crossing and taking into account the volume used to fill the bore-hole. Should the driller believe that circulation is being completely lost he will implement the following procedures:

- 1) Temporarily cease drilling operations, including pump shut down;
- 2) Dispatch experienced observers as required to monitor the area in the vicinity of the crossing, for inadvertent returns of drilling fluid at the surface or in the river;
- 3) Identify the position of the drill head in relation to the point of entry
- 4) Re-start the pump and stroke the bore-hole up and down in stroke lengths up to 30 feet up to 6 times but no fewer than 2 in an effort to size the bore-hole annulus and re-open the circulation pathway.

In addition, the thixotropic properties of the drilling fluid may be thickened within the guidelines set forth by the manufacturer to aid in re-establishing circulation as required depending on bore-

hole conditions. Observers will continuously monitor for inadvertent fluid returns as long as the pump remains on. Occasionally, based on the driller's discretion, it may be useful to increase the stroke length up to 90 feet or past the point at which he believes circulation was lost.

If circulation is re-established, drilling will proceed as usual and monitoring for inadvertent fluid will take place once again if the rate of drilling returns progressively decreases at the fluid entry pit. If circulation is not re-established, monitoring for inadvertent fluid returns to the ground surface and river will continue and drilling will proceed.

If the amount of inadvertent returns is not great enough to allow practical collection, the affected area will be diluted with fresh water and allowed to dry and dissipate naturally back into the earth. If the amount of returns exceeds that which can be suitably contained with hand placed containment barriers, small collection sumps (less than 3.8 cubic meters) will be used to pump fluid back to the solids control system.

When drilling fluid returns are observed to be continuously surfacing above ground at an accessible location the following procedure will be followed:

- 1) Immediately cease pumping of drilling fluid;
- 2) Contain the location such that the drilling fluid cannot migrate across the ground surface;
Materials and equipment used for containment:
 - Straw Bales;
 - Silt Fence;
 - Check Dams;
 - Backhoe for Accessible Areas;
 - Shovels;
 - Portable Pumps;
 - 100 feet of Hose.
- 3) Excavate a small sump pit at the location and provide a means for the fluid to be returned to either the drilling operations or a disposal site (i.e. pump through hose or into tanker);
- 4) Notify on-site contractor supervisor and Owner representative as required by the communication plan;
- 5) Continue drilling operations, maintain the integrity of the containment measures, and monitor the fluid returns as required to ensure that no surface migration occurs;
- 6) Clean-up is carried out once inadvertent returns are contained/controlled;
 - Fluid pumped to a secure containment vessel;
 - Area is diluted with water;
 - Area is restored to original condition.

If inadvertent drilling fluid returns are observed to be surfacing above-ground at a location that is inaccessible, i.e. along the bed of a water body, or, into the water, the following procedures will be followed:

- 1) Ensure that all reasonable measures within the limitations of the technology have been taken to re-establish circulation;
- 2) Continue drilling with the minimum amount of drilling fluid required to penetrate the formation and successfully install the product line.

Typically lost circulation has the highest probability of occurring while the pilot hole is being drilled due to the smaller bore-hole annulus and the relatively large volume of solids being displaced and carried out in the drilling fluid. In the course of drilling the pilot hole, circulation will often be temporarily lost as the pilot bit is advanced through more permeable or less competent sections of the ground formation when fluid pressures are at a maximum. As the pilot bit advances beyond these sections of the bore-hole fluid pressure will fall and circulation within the bore-hole will naturally be re-established. Much of the fluid lost to the formation under the greater pressures will return back to the bore-hole as the pressures fall, in which case the drilling fluid is not likely to migrate to the surface or the river. It is also possible for the drilling fluid to leave the bore-hole and migrate in a direction other than the ground surface or the wetland, in which case it may never be observed even if circulation is lost for long periods of time.

It should be noted that frequently drill cuttings generated as a result of the drilling process will naturally bridge and subsequently seal fractures or voids as drilling progresses, thus providing another means of re-establishing circulation. This is especially likely during the reaming process as higher volumes of larger cuttings are typically generated. Therefore it is usually beneficial to proceed with the pilot hole even if circulation has not been re-established since it will likely be re-established at some point during the reaming process.

The use of an environmentally safe drilling fluid ensures that even in the unlikely event of fluid loss at sensitive areas, there will be no adverse environmental impact other than a temporary minor increase in turbidity until the drilling fluid dissipates. It is important to note that any temporary increase in turbidity as a result of inadvertent drilling fluid loss while directional drilling the crossing will be several orders of magnitude less than that of an open-cut crossing.

ATTACHMENT

BENTONITE BRANDS PRODUCT DATA SHEETS



Certified to
ANSI/NSF 60

MAX GEL™

MAX GEL viscosifier is a premium Wyoming bentonite blended with special extenders producing a viscosifier that will yield more than twice as much viscosity as regular Wyoming bentonite. MAX GEL is a high-yielding, easily mixed, superior mud making bentonite in fresh water.

APPLICATIONS

MAX GEL is used in the following applications to rapidly build mud viscosity and provide superior hole cleaning, as well as to help control lost circulation, formation sloughing and promote hole stability in unconsolidated formations.

- Potable water wells
- Mineral exploration (coring and rotary drilling)
- Horizontal directional drilling
- Blast holes
- Shaft drilling
- Monitor / observation wells
- Gel-foam air drilling applications

ADVANTAGES

- Yields more quickly than API-standard bentonite
- Non-toxic and proven suitable for use in drilling potable water wells
- Increased penetration rates are exhibited due to lower solids content than regular bentonite systems
- Transportation and storage costs are reduced due to lower treatment requirements as compared to bentonite

TYPICAL AMOUNTS OF MAX GEL ADDITIONS ADDED TO FRESH WATER

Drilling Application/Desired Results	lb/100gal	lb/bbl	kg/m3
Normal drilling	15 - 25	6 - 11	15 - 30
In gravel or other poorly consolidated formation	25 - 40	12 - 18	35 - 50
Lost circulation control	35 - 45	15 - 20	40 - 45
Added to freshwater mud to improve hole cleaning properties, increase hole stability and develop filter cakes	5 - 10	2 - 5	6 - 14

LIMITATIONS

- Loses effectiveness in water containing >7500 mg/l sodium chloride / 240 mg/l calcium
- If dispersants or thinners are to be used, they should be added sparingly, using 50% or less of the normal treatment

TYPICAL PHYSICAL PROPERTIES

Physical appearance..... Light tan / gray – green powder
Specific gravity 2.3 - 2.5
Approximate yield 220 bbl/ton

TOXICITY AND HANDLING

Bioassay information available upon request. No special requirements are necessary for handling and storage. Avoid inhalation of dust. A dust respirator and goggles are recommended if mixing in an enclosed area.

PACKAGING AND STORAGE

MAX GEL is packaged in 50 lb. (22.7-kg), multi-wall, paper sacks and is available in bulk. Store in a dry location (slip hazard when wet) and minimize dust (use dust-less systems for handling, storage and cleanup).

MATERIAL SAFETY DATA SHEET

MAX GEL

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME: MAX GEL

OTHER NAME: Bentonite

CHEMICAL CLASS: Naturally occurring mineral.

APPLICATIONS: Oil well drilling fluid additive. Viscosifier.

EMERGENCY TELEPHONE: 281-561-1600

SUPPLIER: Supplied by a Business Unit of
M-I L.L.C.
P.O. Box 42842, Houston, Texas 77242-2842
See cover sheet for local supplier.

TELEPHONE: 281-561-1509

FAX: 281-561-7240

CONTACT PERSON: Sam Hoskin - Manager, Occupational Health

2. COMPOSITION, INFORMATION ON INGREDIENTS

INGREDIENT NAME:	CAS No.:	CONTENTS :	EPA RQ:	TPQ:
Silica, crystalline, quartz	14808-60-7	2-15 %		
Bentonite	1302-78-9	70-95 %		
Silica, crystalline, Cristobalite	14464-46-1	2-12 %		
Silica, crystalline, Tridymite	15468-32-3	1-5 %		
Gypsum	13397-24-5	0-1 %		

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

CAUTION! MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. Avoid contact with eyes, skin and clothing. Avoid breathing airborne product. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

This product is a/an gray to tan powder. Slippery when wet. No significant immediate hazards for emergency response personnel are known.

ACUTE EFFECTS:

HEALTH HAZARDS, GENERAL:

Particulates may cause mechanical irritation to the eyes, nose, throat and lungs. Particulate inhalation may lead to pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma. Dermatitis and asthma may result from short contact periods.

INHALATION: May be irritating to the respiratory tract if inhaled.

INGESTION: May cause gastric distress, nausea and vomiting if ingested.

SKIN: May be irritating to the skin.

EYES: May be irritating to the eyes.

CHRONIC EFFECTS:

CARCINOGENICITY:

IARC: Not listed. NTP: Not listed. OSHA: Not regulated.

ATTENTION! CANCER HAZARD. CONTAINS CRYSTALLINE SILICA WHICH CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

IARC Monographs, Vol. 68, 1997, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or cristobalite from occupational sources causes cancer in humans. IARC classification Group 1.

ROUTE OF ENTRY:

Inhalation. Skin and/or eye contact.

TARGET ORGANS:

Respiratory system, lungs. Skin. Eyes.

4. FIRST AID MEASURES

GENERAL: Persons seeking medical attention should carry a copy of this MSDS with them.

INHALATION: Move the exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. Get medical attention.

INGESTION: Drink a couple of glasses water or milk. Do not give victim anything to drink of he is unconscious. Get medical attention.

SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.

EYES: Promptly wash eyes with lots of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES

AUTO IGNITION TEMP. (?F): N/D

FLAMMABILITY LIMIT - LOWER(%): N/D

FLAMMABILITY LIMIT - UPPER(%): N/D

EXTINGUISHING MEDIA:

This material is not combustible. Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:

No specific fire fighting procedure given.

UNUSUAL FIRE & EXPLOSION HAZARDS:

No unusual fire or explosion hazards noted.

HAZARDOUS COMBUSTION PRODUCTS:

Not relevant.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:

Wear proper personal protective equipment (see MSDS Section 8).

SPILL CLEAN-UP PROCEDURES:

Avoid generating and spreading of dust. Shovel into dry containers. Cover and move the containers. Flush the area with water. Do not contaminate drainage or waterways. Repackage or recycle if possible.

7. HANDLING AND STORAGE**HANDLING PRECAUTIONS:**

Avoid handling causing generation of dust. Wear full protective clothing for prolonged exposure and/or high concentrations. Eye wash and emergency shower must be available at the work place. Wash hands often and change clothing when needed. Provide good ventilation. Mechanical ventilation or local exhaust ventilation is required.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area. Keep in original container.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

INGREDIENT NAME:	CAS No.:	OSHA PEL:		ACGIH TLV:		OTHER:		UNITS:
		TWA:	STEL:	TWA:	STEL:	TWA:	STEL:	
Silica, crystalline, quartz	14808-60-7	*		0.1				mg/m3 resp.dust
Bentonite	1302-78-9	5		3				mg/m3 resp.dust
Silica, crystalline, Cristobalite	14464-46-1	*		0.05				mg/m3 resp.dust
Silica, crystalline, Tridymite	15468-32-3	*		0.05				mg/m3 resp.dust
Gypsum	13397-24-5	15						mg/m3 total dust

INGREDIENT COMMENTS:

* OSHA PELs for Mineral Dusts containing crystalline silica are 10 mg/m3 / (%SiO₂+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite.

PROTECTIVE EQUIPMENT:**ENGINEERING CONTROLS:**

Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to reduce air contamination and keep worker exposure below the applicable limits.

VENTILATION: Supply natural or mechanical ventilation adequate to exhaust airborne product and keep exposures below the applicable limits.

RESPIRATORS: Use at least a NIOSH-approved N95 half-mask disposable or reusable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or reusable particulate respirator. For exposures exceeding 10 x PEL use a NIOSH-approved N100 Particulate Respirator.

PROTECTIVE GLOVES:

Use suitable protective gloves if risk of skin contact.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

PROTECTIVE CLOTHING:

Wear appropriate clothing to prevent repeated or prolonged skin contact.

HYGIENIC WORK PRACTICES:

Wash promptly with soap and water if skin becomes contaminated. Change work clothing daily if there is any possibility of contamination.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE:	Powder, dust.	
COLOR:	Grey. to Tan.	
ODOR:	Odorless or no characteristic odor.	
SOLUBILITY DESCRIPTION:	Insoluble in water.	
DENSITY/SPECIFIC GRAVITY (g/ml):	2.3-2.6	TEMPERATURE (?F): 68
BULK DENSITY:	67 lb/ft ³ ; 1068 kg/m ³	
VAPOR DENSITY (air=1):	N/A	
VAPOR PRESSURE:	N/A	TEMPERATURE (?F):

10. STABILITY AND REACTIVITY

STABILITY: Normally stable.

CONDITIONS TO AVOID:
N/A.

HAZARDOUS POLYMERIZATION:
Will not polymerize.

POLYMERIZATION DESCRIPTION:
Not relevant.

MATERIALS TO AVOID:
N/A

HAZARDOUS DECOMPOSITION PRODUCTS:
No specific hazardous decomposition products noted.

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION:
No toxicological data is available for this product.

12. ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION:
Contact M-I Environmental Affairs for ecological information.

13. DISPOSAL CONSIDERATIONS

WASTE MANAGEMENT:
This product does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc, may render the resulting materials hazardous. Empty containers retain residues. All labeled precautions must be observed.

DISPOSAL METHODS:

Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that containers are empty by RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION

PRODUCT RQ:	N/A
U.S. DOT:	
U.S. DOT CLASS:	Not regulated.
CANADIAN TRANSPORT:	
TDGR CLASS:	Not regulated.
SEA TRANSPORT:	
IMDG CLASS:	Not regulated.
AIR TRANSPORT:	
ICAO CLASS:	Not regulated.

15. REGULATORY INFORMATION**REGULATORY STATUS OF INGREDIENTS:**

NAME:	CAS No:	TSCA:	CERCLA:	SARA 302:	SARA 313:	DSL(CAN):
Silica, crystalline, quartz	14808-60-7	Yes	No	No	No	Yes
Bentonite	1302-78-9	Yes	No	No	No	Yes
Silica, crystalline, Cristobalite	14464-46-1	Yes	No	No	No	Yes
Silica, crystalline, Tridymite	15468-32-3	Yes	No	No	No	Yes
Gypsum	13397-24-5	Yes	No	No	No	Yes

US FEDERAL REGULATIONS:

WASTE CLASSIFICATION: Not a hazardous waste by U.S. RCRA criteria. See Section 13.

REGULATORY STATUS:

This Product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):

SECTION 313: This product does not contain toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR Part 372.

SARA 311 Categories:

- 1: Immediate (Acute) Health Effects.
- 2: Delayed (Chronic) Health Effects.

The components of this product are listed on or are exempt from the following international chemical registries:

TSCA (U.S.)
DSL (Canada)
EINECS (Europe)

STATE REGULATIONS:

STATE REGULATORY STATUS:

This product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):

None.

PROPOSITION 65: This product contains the following chemical(s) considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 as causing cancer or reproductive toxicity, and for which warnings are now required: Silica, crystalline

**CANADIAN REGULATIONS:
LABELS FOR SUPPLY:**



REGULATORY STATUS:

This Material Safety Data Sheet has been prepared in compliance with the Controlled Product Regulations.

Canadian WHMIS Classification: D2A - Other Toxic Effects: Very Toxic Material

16. OTHER INFORMATION

NPCA HMIS HAZARD INDEX:

* 1 Slight Hazard

FLAMMABILITY:

0 Minimal Hazard

REACTIVITY:

0 Minimal Hazard

NPCA HMIS PERS. PROTECT. INDEX:

E - Safety Glasses, Gloves, Dust Respirator

USER NOTES:

N/A = Not applicable N/D = Not determined

INFORMATION SOURCES:

OSHA Permissible Exposure Limits, 29 CFR 1910, Subpart Z, Section 1910.1000, Air Contaminants.

ACGIH Threshold Limit Values and Biological Exposure Indices for Chemical Substances and Physical Agents (latest edition).

Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans, Silica, Some Silicates, Coal Dust, and para-Aramid Fibrils, Vol. 68, World Health Organization, Lyon, France, 1997.

Product information provided by the commercial vendor(s).

PREPARED BY:

Sam Hoskin/bb

REVISION No.:

0

MSDS STATUS:

Approved.

DATE:

June 1, 1999

DISCLAIMER:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.



Super Gel-X ***High Yield Bentonite***

DESCRIPTION:

- Super Gel-X is a 200 mesh, high viscosity 200-bbl yield, sodium bentonite for use in all freshwater drilling conditions.

RECOMMENDED USE:

- May be used for all types of freshwater mud rotary drilling.

CHARACTERISTICS:

- Highly concentrated for maximum yield.
- Fast and easy mixing.
- Reduces solids and increases lifting power.
- Removes cuttings.
- Cools and lubricates bit.
- Stabilizes bore holes.

**MIXING AND
APPLICATION:**

- Mixing ratios are based on 200-bbl yield material using freshwater. Level of water purity will affect bentonite performance.
- Super Gel-X mixing ratio in lbs. per 100 gallons of water:

Normal conditions	15 to 25 lbs.
Sand and gravel	25 to 35 lbs.
Fluid loss controls	35 to 40 lbs.

PACKAGING:

- 50 pound, multi-wall, non-tear, waterproof bags, 48 bags per pallet, and all pallets are stretch-wrapped.

MATERIAL SAFETY DATA SHEET

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200.
 Standard must be consulted for specific requirements.

69101/69101

Page 1 of 3

PRODUCT NAME: SUPER GEL-X™

Section I MANUFACTURER'S INFORMATION

MANUFACTURER'S NAME & ADDRESS:

Date Prepared: June 1, 2002

CETCO – Drilling Products Group
 1500 West Shure Drive
 Arlington Heights, IL 60004

Telephone Number: 847-392-5800 Fax 847-506.6150
EMERGENCY CONTACT: CHEMTREC 800-424-9300
E-mail: www.cetco.com

Section II HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

HAZARDOUS COMPONENTS:

(Specific Chemical Identity: Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Crystalline Quartz: CAS# 14808-60-7			*	< 6%
Respirable Crystalline Quartz:			NIOSH	< 2%
Present (TWA)	0.1 mg/m ³	0.1 mg/m ³	50 ug/m ³	
Proposed (TWA)		50.0 ug/m ³		
Nuisance Dust:				
Respirable	5 mg/m ³	5 mg/m ³		
Total Dust	15 mg/m ³	10 mg/m ³		

* **WARNING:** This product contains a small amount of crystalline silica, which may cause delayed respiratory disease if inhaled over a prolonged period of time. Avoid breathing dust. Use NIOSH/MSHA approved respirator where TLV for crystalline silica (Quartz) may be exceeded. IARC Monographs on the evaluation of the Carcinogenic Risk of Chemicals to Humans (volume 68, 1997) concludes that crystalline silica is carcinogenic to humans in the form of quartz. IARC classification 1.

The small quantities of crystalline silica (quartz) found in this product are, under normal conditions, naturally coated with an unremovable layer of amorphous silica and/or bentonite clay. IARC (vol. 68, 1997, pg. 191-192) has stated that crystalline silica (quartz) can differ in toxicity depending on the minerals with which it is combined, citing studies in IARC (vol. 42, 1987, p. 86) which stated that the toxic effect of crystalline silica (quartz) is reduced by the "protective effect...due mainly to clay minerals..."

National Institute for Occupational Safety and Health (NIOSH) has recommended that the permissible exposure limit be changed to 50 micrograms respirable free silica per cubic meter of air (0.05 mg/ m³) as determined by a full shift sample up to a 10 hour working day, 40 hours per week. *See:* 1974 NIOSH criteria for a recommended Standard for Occupational Exposure to Crystalline Silica should be consulted for more detailed information.

PEL - OSHA Permissible Exposure Limit.

TLV - American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value.

TWA - 8 hour time weighted average

Note: The Permissible Exposure Limits (PEL) reported above are the pre - 1989 limits that were reinstated by OSHA June 30, 1993 following a decision by the United States Circuit Court of Appeals for the 11th Circuit. Federal OSHA is now enforcing these PELs. More restrictive exposure limits may be enforced by some other jurisdictions.

PRODUCT IDENTIFICATION:

Chemical Name: Dry Mixture of Inorganic Mineral Compounds.

NFPA/HMIS: Health - 2, Fire - 0, Reactivity - 0, Specific Hazard - *See Section VI.*

Shipping Class: Not Regulated (DOT / 49CFR, IMDG, ICAO / IATA).

Section III PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: Not Applicable.

Specific Gravity (H₂O = 1): 2.5

Vapor Pressure (mm Hg.): Not Applicable.

Melting Point: 1400°F

Vapor Density (AIR = 1): Not Applicable.

Evaporation Rate (Butyl Acetate = 1): Not Applicable.

Solubility in Water: Negligible.

Appearance and Odor: Tan or beige to light gray colored powder to fine granules, odorless.

PRODUCT NAME: SUPER GEL-X™

Section IV FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used): Not Available. **Flammable Limits:** Not Available. **LEL - NA.** **UEL - NA.**
Extinguishing Media: Not Applicable. **Special Fire Fighting Procedure:** Not Applicable.
Unusual Fire/Explosion Hazards: Product may pose possible dust explosion under *extremely rare* circumstances or conditions.

Section V REACTIVITY DATA

Stability: Stable **Conditions to Avoid -** None Known.
Incompatibility (Materials to Avoid): Powerful oxidizing agents such as fluorine, chlorine trifluoride, manganese trioxide, etc.
Hazardous Decomposition or By-products: Silica will dissolve in hydrofluoric acid producing a corrosive gas, silicon tetrafluoride.
Hazardous Polymerization: Will Not Occur **Conditions to Avoid -** None Known.

Section VI HEALTH HAZARD DATA

Route(s) of Entry: Inhalation? Yes Skin? No Ingestion? No

Health Hazards (Acute and Chronic):

Inhalation: Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may have the following serious chronic health effects:
Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness and reduced pulmonary function. Smoking exacerbates this disease. Individuals with silicosis are predisposed to develop tuberculosis.
Cancer Status: The International Agency for Research on Cancer has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1 - carcinogenic to humans). Refer to *IARC Monograph 68, Silica, Some Silicates and Organic Fibers* (published in June 1997) in conjunction with the use of these materials. The National Toxicology Program classifies respirable crystalline silica as “reasonably anticipated to be a carcinogen”. For further information *See:* “Adverse effects of Crystalline Silica Exposure” published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, page 761-765, 1997.

Other Data with Possible Relevance to Human Health: The small quantities of crystalline silica (quartz) found in this product are, under normal conditions, naturally coated with an unremovable layer of amorphous silica and/or bentonite clay. IARC (Vol. 68, 1997, pg. 191-192) has stated that crystalline silica (quartz) can differ in toxicity depending on the minerals with which it is combined, citing studies in IARC (Vol. 42, 1987 pg. 86) which stated that the toxic effect of crystalline silica (quartz) is reduced by the “protective effect...due mainly to clay minerals...”

Carcinogenicity: NTP? No IARC Monographs? Yes OSHA Regulated? No

Signs and Symptoms of Exposure: Excessive inhalation of generated dust may result in shortness of breath and reduced pulmonary function.

Medical Conditions Generally Aggravated by Exposure: Individuals with respiratory disease, including but not limited to, asthma and bronchitis, or subject to eye irritation should not be exposed to respirable crystalline silica (quartz) dust.

Emergency and First Aid Procedures:

Eyes & Skin: Flush with water.
 Gross Inhalation of Dust: Remove to fresh air; give oxygen or artificial respiration if necessary; seek medical attention.
 Ingestion: If large amounts are swallowed, get immediate medical attention.

Section VII PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken in Case Material is Released or Spilled: Vacuum if possible to avoid generating airborne dust. Avoid breathing dust. Wear an approved respirator. Avoid adding water; product will become slippery when wet.

Waste Disposal Method: Bury in an approved sanitary landfill, in accordance with federal, state and local regulations.

Precautions to Be Taken in Handling and Storing: Avoid breathing dust, use NIOSH/MSHA approved respirator where TLV limits for Crystalline Silica may be exceeded.

Other Precautions: Slippery when wet.

PRODUCT NAME: SUPER GEL-X™

Section VIII CONTROL MEASURES

Respiratory Protection: Use appropriate respiratory protection for respirable particulate based on consideration of airborne workplace concentration and duration of exposure arising from intended end use. Refer to the most recent standards of ANSI (z88.2) OSHA (29 CFR 1910.134), MSHA (30 CFR Parts 56 and 57) and NIOSH Respirator Decision Logic.

Ventilation: Use local exhaust as required to maintain exposures below applicable occupational exposure limits (*See Section II*). See also ACGIH "Industrial Ventilation – A Manual for Recommend Practice", (*current edition*).

Protective Gloves: Not Required. **Eye Protection:** Recommended.

Other Protective Clothing or Equipment: None. **Work/Hygienic Practices:** Use good housekeeping practices.

Section IX REGULATORY INFORMATION

SARA 311/312: Hazard Categories for SARA Section 311/312 Reporting: Chronic Health

SARA 313: This product contains the following chemicals subject to annual release reporting requirements under the SARA section 313 (40 CFR 372): None

CERCLA section 103 Reportable Quantity: None

California Proposition 65: *This product contains the following substances known to the state of California to cause cancer and/or reproductive harm: This product contains crystalline silica (respirable); however, the user should note that the small quantities of crystalline silica (quartz) found in this product are, under normal conditions, naturally coated with an unremovable layer of amorphous silica and/or bentonite clay. IARC (Vol. 68, 1997, pg. 191-192) has stated that crystalline silica (quartz) can differ in toxicity depending on the minerals with which it is combined. Citing studies in IARC (Vol. 42, 1987, p. 86) which stated that the toxic effect of crystalline silica (quartz) is reduced by the "protective effect....due mainly to clay minerals..."*

Toxic Substances Control Act: All of the components of this product are listed on the EPA TSCA Inventory or are exempt from notification requirements.

Canadian Environmental Protection Act: All the components of this product are listed on the Canadian Domestic Substances List or exempt from notification requirements.

European Inventory of Commercial Chemical Substances: All the components of this product are listed on the EINECS Inventory or exempt from notification requirements. (The EINECS number for Quartz: 231-545-5)

European Community Labeling Classification: Harmful (Xn)

European Community Risk and Safety Phrases: R40, R48, S22

Japan MITI: All the components of this product are existing chemical substances as defined in the Chemical Substance Control Law.

Australian Inventory of Chemical Substances: All the components of this product are listed on the AICS Inventory or exempt from notification requirements.

Canadian WHMIS Classification: Class D, Division 2, Subdivision A (Very Toxic Material causing other Toxic Effects)

NF-PA Hazard Rating: Health: 2 Fire: 0 Reactivity: 0

HMIS Hazard Rating: Health: * Fire: 0 Reactivity: 0

***Warning** - Chronic health effect possible - inhalation of silica dust may cause lung injury/disease (silicosis). Take appropriate measures to avoid breathing dust. *See Section II*.

REFERENCES: Registry for Toxic Effects of Chemical Substances (RTECS), 1995.

Patty's Industrial Hygiene and Toxicology.

NTP Seventh Annual Report on Carcinogens, 1994.

IARC Monograph Volume 68, Silica, Some Silicates and Organic Fibers, 1997.

The information herein has been compiled from sources believed to be reliable and is accurate to the best of our knowledge. However, CETCO cannot give any guarantees regarding information from other sources, and expressly does not make any warranties, nor assumes any liability, for its use.



MATERIAL SAFETY DATA SHEET

Product Trade Name: **BARA-KADE® BENTONITE**

Revision Date: 31-Mar-2005

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Trade Name: BARA-KADE® BENTONITE
Synonyms: None
Chemical Family: Mineral
Application: Additive
Manufacturer/Supplier: BPM Minerals LLC
3000 N Sam Houston Parkway East
Houston, TX 77032
Telephone: (281) 871-7900
Fax: (281) 871-7940
Emergency Telephone: (800) 666-9260 or (713) 753-3000
Prepared By: Chemical Compliance
Telephone: 1-580-251-4335

2. COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE	CAS Number	PERCENT	ACGIH TLV-TWA	OSHA PEL-TWA
Crystalline silica, cristobalite	14464-46-1	0 - 1%	0.05 mg/m ³	1/2 x 10 mg/m ³ %SiO ₂ + 2
Crystalline silica, tridymite	15468-32-3	0 - 1%	0.05 mg/m ³	1/2 x 10 mg/m ³ %SiO ₂ + 2
Crystalline silica, quartz	14808-60-7	1 - 5%	0.05 mg/m ³	10 mg/m ³ %SiO ₂ + 2
Bentonite	1302-78-9	60 - 100%	Not applicable	Not applicable

More restrictive exposure limits may be enforced by some states, agencies, or other authorities.

3. HAZARDS IDENTIFICATION

Hazard Overview

CAUTION! - ACUTE HEALTH HAZARD

May cause eye and respiratory irritation.

DANGER! - CHRONIC HEALTH HAZARD

Breathing crystalline silica can cause lung disease, including silicosis and lung cancer. Crystalline silica has also been associated with scleroderma and kidney disease.

This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposures below recommended exposure limits. Wear a NIOSH certified, European Standard EN 149, or equivalent respirator when using this product. Review the Material Safety Data Sheet (MSDS) for this product, which has been provided to your employer.

4. FIRST AID MEASURES

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Skin	Wash with soap and water. Get medical attention if irritation persists.
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
Ingestion	Under normal conditions, first aid procedures are not required.
Notes to Physician	Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flash Point/Range (F):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (F):	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined

Fire Extinguishing Media All standard firefighting media.

Special Exposure Hazards Not applicable.

Special Protective Equipment for Fire-Fighters Not applicable.

NFPA Ratings: Health 0, Flammability 0, Reactivity 0
HMIS Ratings: Flammability 0, Reactivity 0, Health 0*

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures Use appropriate protective equipment. Avoid creating and breathing dust.

Environmental Precautionary Measures None known.

Procedure for Cleaning / Absorption Collect using dustless method and hold for appropriate disposal. Consider possible toxic or fire hazards associated with contaminating substances and use appropriate methods for collection, storage and disposal.

7. HANDLING AND STORAGE

Handling Precautions	This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposure below recommended exposure limits. Wear a NIOSH certified, European Standard En 149, or equivalent respirator when using this product. Material is slippery when wet.
Storage Information	Use good housekeeping in storage and work areas to prevent accumulation of dust. Close container when not in use. Do not reuse empty container.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits listed in Section 2.
Respiratory Protection	Wear a NIOSH certified, European Standard EN 149, or equivalent respirator when using this product.
Hand Protection	Normal work gloves.
Skin Protection	Wear clothing appropriate for the work environment. Dusty clothing should be laundered before reuse. Use precautionary measures to avoid creating dust when removing or laundering clothing.
Eye Protection	Wear safety glasses or goggles to protect against exposure.
Other Precautions	None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Color:	Various
Odor:	Odorless
pH:	8-10
Specific Gravity @ 20 C (Water=1):	2.65
Density @ 20 C (lbs./gallon):	Not Determined
Bulk Density @ 20 C (lbs/ft3):	50-70
Boiling Point/Range (F):	Not Determined
Boiling Point/Range (C):	Not Determined
Freezing Point/Range (F):	Not Determined
Freezing Point/Range (C):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	Not Determined
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Insoluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (lbs./gallon):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistrokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur

Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	Hydrofluoric acid.
Hazardous Decomposition Products	Amorphous silica may transform at elevated temperatures to tridymite (870 C) or cristobalite (1470 C).
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Inhalation	<p>Inhaled crystalline silica in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (IARC, Group 1). There is sufficient evidence in experimental animals for the carcinogenicity of tridymite (IARC, Group 2A).</p> <p>Breathing silica dust may cause irritation of the nose, throat, and respiratory passages. Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may also have serious chronic health effects (See "Chronic Effects/Carcinogenicity" subsection below).</p>
Skin Contact	May cause mechanical skin irritation.
Eye Contact	May cause eye irritation.
Ingestion	None known
Aggravated Medical Conditions	Individuals with respiratory disease, including but not limited to asthma and bronchitis, or subject to eye irritation, should not be exposed to quartz dust.
Chronic Effects/Carcinogenicity	<p>Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis.</p> <p>Cancer Status: The International Agency for Research on Cancer (IARC) has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources can cause lung cancer in humans (Group 1 - carcinogenic to humans) and has determined that there is sufficient evidence in experimental animals for the carcinogenicity of tridymite (Group 2A - possible carcinogen to humans). Refer to <u>IARC Monograph 68, Silica, Some Silicates and Organic Fibres</u> (June 1997) in conjunction with the use of these minerals. The National Toxicology Program classifies respirable crystalline silica as "Known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2).</p> <p>There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by scarring of the lungs, skin, and other internal organs) and kidney disease.</p>

Other Information For further information consult "Adverse Effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, pages 761-768 (1997).

Toxicity Tests

Oral Toxicity: Not determined
Dermal Toxicity: Not determined
Inhalation Toxicity: Not determined
Primary Irritation Effect: Not determined
Carcinogenicity Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997).
Genotoxicity: Not determined
Reproductive / Developmental Toxicity: Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air) Not determined
Persistence/Degradability Not determined
Bio-accumulation Not Determined

Ecotoxicological Information

Acute Fish Toxicity: TLM96: 10000 ppm (Oncorhynchus mykiss)
Acute Crustaceans Toxicity: Not determined
Acute Algae Toxicity: Not determined

Chemical Fate Information Not determined
Other Information Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method Bury in a licensed landfill according to federal, state, and local regulations.
Contaminated Packaging Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

DOT
Not restricted

Canadian TDG
Not restricted

ADR Not restricted

Air Transportation

ICAO/IATA Not restricted

Sea Transportation

IMDG

Not restricted

Other Shipping Information

Labels: None

15. REGULATORY INFORMATION

US Regulations

US TSCA Inventory All components listed on inventory.

EPA SARA Title III Extremely Hazardous Substances Not applicable

EPA SARA (311,312) Hazard Class Acute Health Hazard
Chronic Health Hazard

EPA SARA (313) Chemicals This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).

EPA CERCLA/Superfund Reportable Spill Quantity For This Product Not applicable.

EPA RCRA Hazardous Waste Classification If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

California Proposition 65 The California Proposition 65 regulations apply to this product.

MA Right-to-Know Law One or more components listed.

NJ Right-to-Know Law One or more components listed.

PA Right-to-Know Law One or more components listed.

Canadian Regulations

Canadian DSL Inventory All components listed on inventory.

WHMIS Hazard Class D2A Very Toxic Materials (Crystalline silica)

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS
Not applicable

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****



MATERIAL SAFETY DATA SHEET

Product Trade Name: **BARA-KADE® BENTONITE**

Revision Date: 31-Mar-2005

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Trade Name: BARA-KADE® BENTONITE

Synonyms: None

Chemical Family: Mineral

Application: Additive

Manufacturer/Supplier: BPM Minerals LLC
3000 N Sam Houston Parkway East
Houston, TX 77032

Telephone: (281) 871-7900

Fax: (281) 871-7940

Emergency Telephone: (800) 666-9260 or (713) 753-3000

Prepared By: Chemical Compliance
Telephone: 1-580-251-4335

2. COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE	CAS Number	PERCENT	ACGIH TLV-TWA	OSHA PEL-TWA
Crystalline silica, cristobalite	14464-46-1	0 - 1%	0.05 mg/m ³	1/2 x 10 mg/m ³ - %SiO ₂ + 2
Crystalline silica, tridymite	15468-32-3	0 - 1%	0.05 mg/m ³	1/2 x 10 mg/m ³ - %SiO ₂ + 2
Crystalline silica, quartz	14808-60-7	1 - 5%	0.05 mg/m ³	10 mg/m ³ - %SiO ₂ + 2
Bentonite	1302-78-9	60 - 100%	Not applicable	Not applicable

More restrictive exposure limits may be enforced by some states, agencies, or other authorities.

3. HAZARDS IDENTIFICATION

Hazard Overview

CAUTION! - ACUTE HEALTH HAZARD

May cause eye and respiratory irritation.

DANGER! - CHRONIC HEALTH HAZARD

Breathing crystalline silica can cause lung disease, including silicosis and lung cancer. Crystalline silica has also been associated with scleroderma and kidney disease.

This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposures below recommended exposure limits. Wear a NIOSH certified, European Standard EN 149, or equivalent respirator when using this product. Review the Material Safety Data Sheet (MSDS) for this product, which has been provided to your employer.

4. FIRST AID MEASURES

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Skin	Wash with soap and water. Get medical attention if irritation persists.
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
Ingestion	Under normal conditions, first aid procedures are not required.
Notes to Physician	Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flash Point/Range (F):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (F):	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined

Fire Extinguishing Media All standard firefighting media.

Special Exposure Hazards Not applicable.

Special Protective Equipment for Fire-Fighters Not applicable.

NFPA Ratings: Health 0, Flammability 0, Reactivity 0
HMS Ratings: Flammability 0, Reactivity 0, Health 0*

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures Use appropriate protective equipment. Avoid creating and breathing dust.

Environmental Precautionary Measures None known.

Procedure for Cleaning / Absorption Collect using dustless method and hold for appropriate disposal. Consider possible toxic or fire hazards associated with contaminating substances and use appropriate methods for collection, storage and disposal.

7. HANDLING AND STORAGE

Handling Precautions	This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposure below recommended exposure limits. Wear a NIOSH certified, European Standard En 149, or equivalent respirator when using this product. Material is slippery when wet.
Storage Information	Use good housekeeping in storage and work areas to prevent accumulation of dust. Close container when not in use. Do not reuse empty container.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits listed in Section 2.
Respiratory Protection	Wear a NIOSH certified, European Standard EN 149, or equivalent respirator when using this product.
Hand Protection	Normal work gloves.
Skin Protection	Wear clothing appropriate for the work environment. Dusty clothing should be laundered before reuse. Use precautionary measures to avoid creating dust when removing or laundering clothing.
Eye Protection	Wear safety glasses or goggles to protect against exposure.
Other Precautions	None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Color:	Various
Odor:	Odorless
pH:	8-10
Specific Gravity @ 20 C (Water=1):	2.65
Density @ 20 C (lbs./gallon):	Not Determined
Bulk Density @ 20 C (lbs/ft3):	50-70
Boiling Point/Range (F):	Not Determined
Boiling Point/Range (C):	Not Determined
Freezing Point/Range (F):	Not Determined
Freezing Point/Range (C):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	Not Determined
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Insoluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (lbs./gallon):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistrokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data:	Stable
Hazardous Polymerization:	Will Not Occur

Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	Hydrofluoric acid.
Hazardous Decomposition Products	Amorphous silica may transform at elevated temperatures to tridymite (870 C) or cristobalite (1470 C).
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Inhalation	<p>Inhaled crystalline silica in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (IARC, Group 1). There is sufficient evidence in experimental animals for the carcinogenicity of tridymite (IARC, Group 2A).</p> <p>Breathing silica dust may cause irritation of the nose, throat, and respiratory passages. Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may also have serious chronic health effects (See "Chronic Effects/Carcinogenicity" subsection below).</p>
Skin Contact	May cause mechanical skin irritation.
Eye Contact	May cause eye irritation.
Ingestion	None known
Aggravated Medical Conditions	Individuals with respiratory disease, including but not limited to asthma and bronchitis, or subject to eye irritation, should not be exposed to quartz dust.
Chronic Effects/Carcinogenicity	<p>Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis.</p> <p>Cancer Status: The International Agency for Research on Cancer (IARC) has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources can cause lung cancer in humans (Group 1 - carcinogenic to humans) and has determined that there is sufficient evidence in experimental animals for the carcinogenicity of tridymite (Group 2A - possible carcinogen to humans). Refer to <u>IARC Monograph 68, Silica, Some Silicates and Organic Fibres</u> (June 1997) in conjunction with the use of these minerals. The National Toxicology Program classifies respirable crystalline silica as "Known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2).</p> <p>There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by scarring of the lungs, skin, and other internal organs) and kidney disease.</p>

Other Information For further information consult "Adverse Effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, pages 761-768 (1997).

Toxicity Tests

Oral Toxicity: Not determined
Dermal Toxicity: Not determined
Inhalation Toxicity: Not determined
Primary Irritation Effect: Not determined
Carcinogenicity Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997).
Genotoxicity: Not determined
Reproductive / Developmental Toxicity: Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air) Not determined
Persistence/Degradability Not determined
Bio-accumulation Not Determined

Ecotoxicological Information

Acute Fish Toxicity: TLM96: 10000 ppm (Oncorhynchus mykiss)
Acute Crustaceans Toxicity: Not determined
Acute Algae Toxicity: Not determined

Chemical Fate Information Not determined
Other Information Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method Bury in a licensed landfill according to federal, state, and local regulations.
Contaminated Packaging Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

DOT
Not restricted

Canadian TDG
Not restricted

ADR Not restricted

Air Transportation

ICAO/IATA Not restricted

Sea Transportation

IMDG

Not restricted

Other Shipping Information

Labels: None

15. REGULATORY INFORMATION

US Regulations

US TSCA Inventory All components listed on inventory.

EPA SARA Title III Extremely Hazardous Substances Not applicable

EPA SARA (311,312) Hazard Class Acute Health Hazard
Chronic Health Hazard

EPA SARA (313) Chemicals This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).

EPA CERCLA/Superfund Reportable Spill Quantity For This Product Not applicable.

EPA RCRA Hazardous Waste Classification If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

California Proposition 65 The California Proposition 65 regulations apply to this product.

MA Right-to-Know Law One or more components listed.

NJ Right-to-Know Law One or more components listed.

PA Right-to-Know Law One or more components listed.

Canadian Regulations

Canadian DSL Inventory All components listed on inventory.

WHMIS Hazard Class D2A Very Toxic Materials (Crystalline silica)

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS
Not applicable

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

ATTACHMENT

ADDITIVES PRODUCT DATA SHEETS

TYPICAL - DRILLING FLUID PRODUCTS LIST
MI HDD Mining Products or EQUAL

Note: Typical drilling fluid product list is as follows. Driller will utilize various brands of drilling fluid products based on: functionality, economics, geographic-location to supplier, and type of formation anticipated on encountering. The brand represented below is MI HDD MINING & WATERWELL brand. An equal brand of products may be supplied as an alternative.

1. **High Yield Bentonite:** is an easy-to-mix, finely ground (200-mesh), premium-grade, high-yielding Wyoming sodium bentonite. MAX-GEL/Pargel-220 imparts viscosity, fluid loss control and gelling characteristics to freshwater-based drilling fluids.
Quantity - As Required

2. **Poly-Pac R** is a non fermenting cellulosic polymer, provides filtration control in water based drilling fluids with out substantially increasing the viscosity of the drilling fluid pressures. This product is a primary drilling fluid rheology enhancing additive.
Quantity - minimum 10 (25 lb bags)

3. **Poly Plus (Emulsion Liquid Polymer)** is used primarily as a borehole stabilizer to prevent reactive shale and clay from swelling and sloughing. It is also used to increase lubricity, fluid viscosity, and to improve cuttings carrying capacity.
Quantity - minimum 10 (5-gallon containers)

4. **Duo-Vis/Super-Vis** is used to increase viscosity for cuttings transport and suspension. Works to provide an optimized rheological profile with elevated low-shear-rate viscosity and highly shear-thinning characteristics with low “n” values.
Quantity – minimum 10 (2-gallon containers)
Quantity – minimum 10 (25-lb bags)

5. **DrilPlex** is used for increased yield point and gel strength. Allows the formulation of fluids with exceptional shear-thinning properties.
Quantity – minimum 5 (40-lb bag)

6. **Soda Ash** is used to increase Ph in the make-up water. Primarily used to reduce soluble calcium in water-based drilling muds and make-up waters. Calcium is present in many make-up waters and formations.
Quantity – minimum 5 (40-lb bag)

7. **Smooth Grout 20** is a one sac borehole plugging and grouting material. It is commonly used in grouting of water well applications. This product will be used to plug excessive losses.
Quantity - minimum 20 (50-lb bags)

8. **Smooth Bore/Maxbore HDD** is a single sack, premium grade, Wyoming sodium **bentonite** designed for fast, easy mixing. Smooth Bore/Maxbore HDD imparts superior suspension properties and filtration control to freshwater fluids. Although designed for use in horizontal directional drilling, it can be used in Water Wells in unconsolidated formations or when additional gel strengths are required to compensate for low annular velocity.
Quantity - As Required