CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
1515 CLAY STREET, SUITE 1400
OAKLAND, CA 94612

DRAFT
Initial Study/Mitigated Negative Declaration

Sediment Remediation Project, Piers 39 to 43½
San Francisco, CA

STATE CLEARINGHOUSE # TBD

October 2021

CONTENTS

[1] Note: Sensitive information on archaeological resources located within the vicinity of the Project Area may be redacted.

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ACRONYMS AND ABBREVIATIONS

μg/kg	microgram per kilogram
AB	Assembly Bill
AMM	avoidance and minimization measure
AMS	Alternative Management Standards
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
Basin Plan	San Francisco Bay Basin (Region 2) Water Quality Control Plan
Bay	San Francisco Bay
Bay Plan	San Francisco Bay Plan
BCDC	San Francisco Bay Conservation and Development Commission
BMP	best management practice
BRA	biological resource analysis
Btu	British thermal unit
CAL FIRE	California Department of Forestry and Fire Protection
CalEEMod	California Emissions Estimate Model
Cal/OSHA	California Division of Occupational Safety and Health
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH_4	methane
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society

CO	carbon monoxide
CO_2	carbon dioxide
CO_2eq	CO_2 equivalents
CWA	Clean Water Act
cy	cubic yard
CZMA	Coastal Zone Management Act
dBA	A-weighted decibel
DDT	dichlorodiphenyltrichloroethane
DMMO	Dredged Material Management Office
DPM	diesel particulate matter
DPS	Distinct Population Segment
DRET	dredge elutriate testing
DTSC	California Department of Toxic Substances Control
EFH	essential fish habitat
EPA	U.S. Environmental Protection Agency
ESU	Evolutionarily Significant Unit
FESA	federal Endangered Species Act
FMP	Fisheries Management Plan
FS/RAP	Feasibility Study and Remedial Action Plan
GHG	greenhouse gas
GWh	gigawatt-hour
Haley & Aldrich	Haley & Aldrich, Inc.
HAPC	Habitat Area of Particular Concern
IC	institutional control
IHA	Incidental Harassment Authorization
IPaC	Information for Planning and Consultation
IS	Initial Study
ITP	Incidental Take Permit
JMC	Johnson Marigot Consulting, LLC
kWh	kilowatt-hour
Ldn	day-night average sound level

LOS	level of service
LTMS	Long-Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region
MBTA	Migratory Bird Treaty Act
MGP	manufactured gas plant
MHF	material handling facility
MLLW	mean lower low water
mm Hg	millimeters of mercury
MMPA	Marine Mammal Protection Act
MND	Mitigated Negative Declaration
MPRSA	Marine Protection, Research and Sanctuaries Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
Muni	San Francisco Municipal Railway
NAHC	Native American Heritage Commission
NAPL	nonaqueous-phase liquid
ng/L	nanograms per liter
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NO_2	nitrogen dioxide
NOx	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O_3	ozone
OSHA	Occupational Safety and Health Administration
OUL	operational use limit
PAH	polycyclic aromatic hydrocarbon
PG&E	Pacific Gas and Electric Company
$PM_{2.5}$	fine particulate matter with a diameter less than 2.5 microns
PM_{10}	respirable particulate matter with a diameter less than 10 microns
ppm	parts per million
Port	Port of San Francisco

Project Area	Piers 39 to 43½
RAL	remedial action level
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
Regional Water Board	San Francisco Bay Regional Water Quality Control Board
RHA	Rivers and Harbors Act
ROG	reactive organic gas
SF Air Basin	San Francisco Bay Area Air Basin
SF-DODS	San Francisco Deep Ocean Disposal Site
SFCTA	San Francisco County Transportation Authority
SFDPH	San Francisco Department of Public Health
SFPUC	San Francisco Public Utilities Commission
TAC	toxic air contaminant
US 101	U.S. Highway 101
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
VHFHSZ	very high fire hazard severity zone
VMT	vehicle miles traveled
WDR	waste discharge requirement
WETA	Water Emergency Transportation Authority
WOTUS	waters of the United States/State

GLOSSARY

Aquatic disposal—The disposal of material to an aquatic environment (i.e., a water body). Disposal can only occur within a permitted area considered suitable for disposal.

Armoring—A permanent protective layer of rock or similar material over an area to prevent erosion.

Avoidance and minimization measures—Measures that aim to reduce potentially disruptive impacts on the environment.

Bathymetry survey—A measure of the underwater sediment surface elevations, similar to topographic contours above ground.

Beneficial reuse—Repurposing of waste materials for a new productive use. For example, dredged material reused for beach nourishment or wetland creation once tested and deemed acceptable for reuse.

Berths—Docking space for vessels.

Bioaccumulation—The accumulation of chemical substances in an organism. This occurs when the rate of absorption of harmful substances in the tissues (e.g., fat or muscle) of an organism is greater than the rate of expulsion.

Buffer—An area established around a work zone to prevent harm or reduce impacts to structures.

Capping—A cover that is placed on top of contaminated sediment to minimize further contact with or release of potentially toxic materials into the environment. Capping may include one or more of the following: natural materials (e.g., clean sand), engineered materials (e.g., geotextile), and/or amendments (e.g., activated carbon). A cap can also include one or more layers that provide "armoring" to prevent erosion (see above). Some layers can be designed to provide suitable habitat for aquatic life.

Coal tars—Thick, black liquid by-products of the production of coal gas or coke from coal.

Dewatering and conditioning—Processes by which dredged sediment with high water content is dried and stabilized for transport and landfill disposal.

Diver-assisted micro hydraulic dredging—A process by which a pump is operated by a diver to accomplish low volume sediment removal. This is not designed for large mass removal of sediment but does allow for more precision in smaller less accessible areas.

Dredging—Removal of material and sediment from the bottom of a water body.

Institutional controls—Administrative and legal measures, such as land use or activity restrictions, to reduce disturbance of remediated areas and the potential for exposure to contamination remaining in place.

Mechanical dredging—A process by which an excavator equipped with a bucket, clamshell, or other heavy equipment excavates out the bed of a body of water to remove sediment.

Operational use limits—Guidelines on maintenance dredging boundaries (lateral and vertical) to ensure functionality of access to and from berthing areas (adequate draft, turning basins, etc.) based on known or anticipated tenants or berth user requirements.

Overdredge allowance—The amount of additional depth of dredging (sediment removal) allowed below a defined level, to provide a buffer for dredging operations, or changes in physical conditions.

Pile—A long cylinder of a strong material such as concrete, steel, or wood that is installed in the ground or sediment to act as a support for structures built on top of it or attached to it, for example, a mooring pile.

Polycyclic aromatic hydrocarbons—Organic compounds containing only carbon and hydrogen in ring formations. These compounds occur in petroleum, coal tars and tar deposits, tar-based asphalt sealants, creosote, and soot from burning wood and fuel and can have adverse health effects on people and the environment.

Porosity and permeability—Terms to refer to the physical properties of the sediment, in relation to surrounding liquids and gases. Porosity is a measure of how much space exists between grains or within cracks or cavities of a material (such as sediment). Permeability is a measure of the ease with which a fluid (water in this case) or gas can move through a porous material.

Remedial action—To prevent, clean up, remove, reduce, or minimize the cause of damage to an environment.

Remedial action level—The contaminant-specific sediment concentration that triggers the need for remediation (i.e., dredging, capping).

Remedial action objective—Media-specific goals that remedial alternatives/remedies need to achieve for the protection of human health and the environment.

Remedial Investigation Report—A report that compiles data on site conditions, including the nature and extent of chemical contamination, in order to better understand risks to human health and the environment and determine the need for remedial action.

San Francisco Deep Ocean Disposal Site—A designated deep ocean area permitted for the disposal of dredged material near the Farallon Islands. The San Francisco Deep Ocean Disposal Site is the deepest and farthest off shore of any ocean disposal site in the U.S.

Scour holes—Areas of deeper mudline elevations (compared to surrounding areas) formed by the erosion of sediment caused by waves, currents, or vessels (or a combination thereof).

Seawall—A physical structure designed to protect human-inhabited areas from offshore processes (tides, tsunamis, waves, erosion).

Sediment/material handling and disposal—Processes related to safe dredged material management (e.g., drying, stabilization), transportation, and disposal of sediments.

Sensitive or special status species—Any species that is listed, or proposed for listing, as threatened or endangered by a federal or state agency; any species in a category implying potential endangerment or extinction. Their presence within a project area may warrant specific protective measures.

Slurrying—Creating a watery mixture of insoluble matter such as mud or sediment.

Soil Pinning—A slope stabilization technique involving inserting reinforcing elements (e.g., rods or pilings) vertically into the slope. Often referred to as "soil nailing."

Staging areas—Physical locations used for the temporary storage of construction material, equipment, supplies, and facilities for personnel.

Transloading—The process of transferring material from one mode of transportation (e.g., land- or water-based) to another.

Waste characterization—The process by which the composition of a waste stream or material is characterized for proper handling and disposal. Provides detailed information on the type of waste in a given waste stream, for example hazardous vs. non-hazardous.

Work windows—Periods of time within which in-water construction is permitted to occur, for example to accommodate movement or spawning of sensitive fish species.

The San Francisco Bay Regional Water Quality Control Board (Regional Water Board) has completed the following Initial Study (IS) and Mitigated Negative Declaration (MND) for remediation of offshore sediment (the Project) at Piers 39 to 43½ (the Project Area), within the Port of San Francisco (Port), in accordance with the requirements of the California Environmental Quality Act (CEQA) (California Public Resources Code, Division 13, Section 2100 et seq.) and CEQA Guidelines (Title 14, California Code of Regulations, Chapter 3, Section 15000 et seq.). The Regional Water Board is the CEQA Lead Agency for the Project. The Project sponsor and applicant is the Pacific Gas and Electric Company (PG&E), a former owner and operator of the former Beach Street Manufactured Gas Plant (MGP). The Port is the property owner and co-applicant.

Project information is provided below.

<table>
<tr><td colspan="3">PROJECT TITLE:
Sediment Remediation Project, Piers 39 to 43½, San Francisco, CA
GeoTracker ID: T1000007367 (RAS)
State Clearinghouse #: XXX</td></tr>
<tr><td>PROJECT ADDRESS:
Pier 39, the Pier 39 East and West Basins, and the intertidal and subtidal area between Pier 39 and Pier 43½ within San Francisco Bay, extending from the seawall to approximately 1,000 feet offshore</td><td>CITY:
San Francisco, CA 94133</td><td>COUNTY:
San Francisco</td></tr>
<tr><td>CEQA LEAD AGENCY:
San Francisco Bay Regional Water Quality Control Board (Regional Water Board)</td><td>CONTACT:
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San Ramon, CA 94583</td></tr>
<tr><td>CO-APPLICANT
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<tr><td colspan="3">APPROVAL ACTION UNDER CONSIDERATION:
The proposed action consists of approving and implementing a remedial action for impacted (i.e., contaminated) sediments.</td></tr>
</table>

The Regional Water Board issued orders that required the preparation and submittal of site investigation, monitoring, and other technical reports under California Water Code section 13267. The Regional Water Board will issue a Cleanup and Abatement Order under

California Water Code section 13304 to require and authorize the Project (i.e., the remediation of contaminated sediment within the Project Area). Based on the analysis presented in this IS, the Regional Water Board has determined that the Project, with implementation of the recommended mitigation measures, will not result in significant environmental impacts. The Project sponsor has agreed to include the recommended mitigation measures in the Project design. These measures would reduce all identified significant impacts to a less-than-significant level. Therefore, preparation of an Environmental Impact Report is not required, and an MND has been prepared for the Project.

1 PROJECT OVERVIEW AND PURPOSE

The purpose of the Project is to remediate (i.e., clean up) sediments impacted (i.e., contaminated) with polycyclic aromatic hydrocarbons (PAHs) within the Project Area to protect human health and the environment. Previous environmental investigations (summarized below) indicate that contaminants are present in offshore sediments within the Project Area and pose a risk to human health and the environment. Under California Water Code section 13304, where waste discharged into the waters of the state "creates, or threatens to create, a condition of pollution or nuisance, shall, upon order of the regional board, clean up the waste or abate the effects of the waste, or, in the case of threatened pollution or nuisance, take other necessary remedial action, including, but not limited to, overseeing cleanup and abatement efforts." The chemicals of concern have been identified as PAHs.

The recommended alternative for remediation is described in detail in the Feasibility Study/Remedial Action Plan (FS/RAP) prepared by Haley & Aldrich, Inc. (Haley & Aldrich) on behalf of PG&E (Haley & Aldrich 2021). The remedial action objective (RAO) provided in the FS/RAP describes the objective of the remediation as follows:

- Prevent toxicity to fish, birds, or humans exposed to PAHs through consumption of biota with PAH concentrations bioaccumulated in prey tissue via direct contact with sediments and associated pore water or through the aquatic food web.

The recommended remedial approach includes a combination of dredging (to remove a portion of the contaminated sediments) and capping of impacted sediments left in place to minimize or reduce exposure to the impacted sediment and erosion protection measures (also called "armoring") to mitigate scour caused by ferry and boat traffic and other foreseeable operational uses. This remedial approach would be coupled with long-term monitoring and institutional controls (ICs) (see Section 4 for the full project description). Contaminated sediments removed from the Project Area would be dewatered and conditioned (i.e., dried and prepared for transportation), loaded into trucks, and disposed of properly. Some of the sediments may be suitable for beneficial reuse.

2 SETTING

The Project Area consists of the Piers 39 to 43½ offshore sediment remediation area. The Project would also include a location for construction staging and material handling activities (including dredged material handling), which would be within an upland area. Staging and material management are anticipated to take place within the Port's Pier 96 marine terminal, or as an alternative option, at Berth 10 at the Port of Oakland. The Port's Pier 96 area is assumed to be the preferred material handling facility (MHF) and is the primary area evaluated herein. Berth 10 is evaluated as a secondary location. Various aspects of staging (e.g., equipment and material storage, parking for personnel, office facilities) may take place in multiple locations within the Port of San Francisco under a lease agreement.

2.1 Project Location

The Project Area encompasses Pier 39, both the Pier 39 East Basin and the Pier 39 West Basin, and the intertidal and subtidal area between Pier 39 and Pier 43½ along the margin of San Francisco Bay (the Bay) in San Francisco (Figure 2-1). Piers 39 to 43½ extend into the Bay to the north of The Embarcadero, a major road oriented east-west to the south of the Project Area, approximately between Taylor Street and Kearny Street. The seawall, which extends east-west along the entire Project Area and is located bayward of the historical natural shoreline (i.e., the shoreline that existed before filling of the Bay), serves as the southern boundary of the Project Area. The bayward limits of the Project Area extend approximately 1,000 feet offshore. The sediment investigation area extended west to Pier 45 and east to Pier 35 and encompassed approximately 47 acres of submerged land, but the results of the Remedial Investigation (Haley & Aldrich 2020a) eliminated the Pier 35 and Pier 45 areas from consideration for remediation.

The Project Area includes a small craft marina; multiple piers housing vessels for bay excursions, cruises, sailing, fishing, and ferry operations; and a high concentration of visitor-related commercial development (shops and restaurants). The adjacent upland area consists of densely developed commercial areas including parking lots, hotels, shops, restaurants, pedestrian and bicycle pathways, a playground, and some park areas. Additional commercial and high-density residential buildings are located three blocks south of the Project Area along Bay Street.

Pier 96 is located on the Port's southern waterfront approximately 6 miles south of the Project Area (Figure 2-1) and is proposed as the area to be used for equipment staging and handling of marine debris and dredge sediments required for the Project. Pier 96 is composed of asphalt- and concrete-covered land with pile-supported concrete wharf sufficient for vessel and barge mooring activities included in the Project. Pier 96 has been used in the past by the Port to handle marine debris and dredge material.

Berth 10 is located approximately 5.5 miles from the Project Area in the Port of Oakland's Outer Harbor. Berth 10 was constructed in 1995; the "purpose of the facility is to rehandle (i.e., dewater and otherwise prepare) dredged material prior to transportation to and disposal at a permitted landfill or, if determined suitable, beneficial reuse at an upland site" (Regional Water Board 2013). About half of the facility is constructed on a pile-supported concrete wharf and the remaining half is on asphalt-covered land. The 4.4-acre facility is enclosed by a system of gravel and earthen berms topped with concrete "K" rail. The Regional Water Board (2013) issued Waste Discharge Requirements authorizing the facility as a "multi-user dredged material rehandling facility, meaning that dredgers other than the Port may make arrangements with the Port to rehandle dredged material for eventual upland disposal or beneficial reuse."

2.2 Physical Setting

The largest tidal fluctuations along the northern waterfront are from approximately –1.5 to +7.0 feet mean low lower water (MLLW), but typical daily tidal variations are about half as large. The offshore area exhibits varying mudline elevations depending on currents, sedimentation rates, and vessel activities. Maintenance dredging is performed in portions of the Project Area every 3 to 5 years to ensure safe navigation for vessels. Depressions resulting from propeller wash ("scour areas") are observed in four locations (Figure 2-2): within the southwest corner of the Pier 39 West Basin where the Blue & Gold Fleet excursion vessels berth, at Pier 41½ where the San Francisco Bay Ferries berth, at Pier 43½ where the Red and White Fleet vessels berth, and on the eastern edge of the Pier 39 East Basin (near the entrance to that marina). These features suggest that the primary hydrodynamic driver near the shoreline of the Project Area is vessel operations.

Multi-beam bathymetric surveys show debris (e.g., wood, concrete, wood pile stubs, metallic items, and unidentifiable objects) on the seafloor of the Project Area with the highest density located within the footprint of the former Pier 43, demolished by the Port in 2008 (Figure 2 in Haley & Aldrich 2020a). In addition, unidentifiable objects are located farther offshore and closer to the Fisherman's Pier, nearshore within the Pier 39 West Basin, and within the footprint of the former Pier 37 within the Pier 39 East Basin.

The Remedial Investigation confirmed that the Project Area sediments are predominantly silt with varying amounts of sand and clay, consistent with the ubiquitous bay mud found throughout the Bay. The sediment at the mudline is generally soft with a high water content; however, with depth (approximately 2 to 3 feet below mudline), the sediment is more consolidated. Porosity and permeability generally decrease with depth below mudline.

As authorized by Port maintenance dredge permits, the Pier 96 berths are maintained at a depth of −40 feet MLLW to allow safe navigation and vessel berthing.

The Port of Oakland's Berth 10 is authorized to be maintained at a depth of –50 feet MLLW according to the Oakland Harbor Navigation Improvement Project (USACE 2020b).

3 BACKGROUND

3.1 History

The Pier 39 to Pier 43½ area and adjacent upland area were historically part of the Bay. Tidal mudflats were present adjacent to the natural shoreline. The first 11 sections of the seawall, from the Ferry Building to Taylor Street, were constructed between 1878 and 1894. By 1899, the seawall had been completed to Taylor Street, and an embayment existed west of Mason Street. A small area west of Mason Street was filled between 1899 and 1905. By

1913, the area behind the seawall had been completely filled. The seawall remains in place to this day. The current and historical shorelines are shown in Figure 2-2.

Between 1913 and 1917, Piers 29 to 41 were built along the waterfront (Corbett 2011). Pier 45 was constructed in 1929 (Corbett 2011), and Piers 43 and 43½ had been built by 1938. The only change between 1938 and 1968 was the shortening of Pier 43. Piers 39 and 41 were demolished in approximately 1976, and Pier 39 was redeveloped as a commercial destination, flanked by the East Basin and West Basin marinas, opening in 1978. Pier 43 was mostly demolished and the current Pier 41½ was constructed between 1980 and 2011. In 2013, the Port completed a project to improve public access along the waterfront by removing most of Pier 43½ and constructing a new pedestrian and bicycle promenade.

Commercial enterprises historically located in the area have been identified mainly using Sanborn maps. The 1899 Sanborn map shows the San Francisco Lumber Preserving Company occupying what subsequently became the location of the former Beach Street MGP. Shortly thereafter, the San Francisco Coke and Gas Company acquired the property and in June 1900 began coke and coal gas production (Coleman 1952). In 1907, the San Francisco Coke and Gas Company changed its corporate name to Metropolitan Light and Power Company and converted to carbureted water gas and oil gas production (San Francisco Superior Court 1907). PG&E purchased the former Beach Street MGP in 1911 and operated it until 1931, when natural gas became available in San Francisco and gas manufacturing ceased at this location (Treadwell & Rollo 1997).

Three different gasification processes are known to have been used at the former Beach Street MGP. Each of these gas generation processes produces somewhat different by-products, specifically nonaqueous-phase liquid (NAPL) coal tars and solid lampblack, all of which predominantly contain PAHs. Many of these by-products could be sold as fuel or for other uses. Raw materials, such as coal, and gasification by-products, such as NAPL tars and lampblack, were commonly transported over water in the Bay. Loading and offloading were a common source of spillage in the vicinity of docking areas. However, in the era prior to regulated waste management, it is also plausible that excess material may have been placed in the Bay along the shoreline and/or from historical piers that extended into the Bay.

In the mid-1950s, the property was sold and the gas holder and oil tanks were subsequently dismantled before the block was redeveloped for commercial use (PG&E 2016; EMG 1995; Treadwell & Rollo 1997). In 1963, a hotel and retail space were constructed (EMG 1995). Beginning in 1997, further actions were undertaken to characterize and mitigate contaminated soils at the Beach Street MGP.

Prior to 1900, other industrial uses in the vicinity of the Project Area included crystal salt water baths, metal working, a chemical company, lumber yards, a grain shipping and receiving facility, manufacturing, a gas company, and a pile preserving works (in addition to the San Francisco Timber Preserving Company). From 1905 to 1913, a wide variety of businesses operated in the vicinity of the Project Area including a fish salting and smoking business, tanning house, oil company, sawmill, box factory, pipe works, and cannery. By 1913, most of the Project Area had been filled in and developed predominantly with companies associated with the lumber industry. The Otis Elevator Company and Stauffer Chemical Company were also present in this era. The 1938 Sanborn map shows that the northern lumber yards had been removed and replaced by rail lines. The Otis Elevator Company and Stauffer Chemical Company remained, and the San Francisco Municipal Rail Yard and Kirkland Bus Yard were added by 1950.

3.2 Current Land Use

The Project Area is located on the Port's Northern Waterfront on the Bay adjacent to a densely developed tourist area. Figure 3-1 shows the Port's land uses, including tenants and their lease boundaries, the Port's stormwater lines and outfalls, and the San Francisco Public Utilities Commission (SFPUC) combined sewer outfall.

In general, the shoreline and piers surrounding the Project Area are zoned C-2 Community Business and P for plaza and park and have a high concentration of visitor-related commercial development, including more than 120 shops and other visitor attractions, including a carousel, an aquarium, and a 300-boat public marina at Pier 39. Fresh seafood restaurants, chowder houses, and crab shacks also occupy a substantial portion of the upland adjacent to the Project Area (Port of San Francisco 2019). Bay scenic cruise boats and ferry terminals and their supporting infrastructure are located on three piers within the Project Area. Pier 35 West (located at the eastern border but not part of the Project Area) is used for cruise ship calls or vessel layberthing.

There are no sensitive land uses (e.g., hospitals, schools, daycare centers, nursing homes) within ¼ mile of the Project Area. There are no residences immediately adjoining the Project Area, but as discussed above, there are hotels adjacent to the Project Area and apartment buildings within three blocks.

Although Dungeness crab and Pacific herring are commercially harvested from the Bay, these species are not likely to occur within the Project Area with any frequency given the busy marina traffic. For the same reason, sportfishing from boats is not commonly observed within the Project Area, but licensed fishing from piers does occur. The most commonly used fishing location is the narrow walking pier that forms the western breakwater of the Pier 39 West Basin, referred to as "the Fisherman's Pier."

3.2.1 Pier 43½

Pier 43½ is the westernmost structure within the Project Area. From Pier 43½, the Red and White Fleet operates landside concessions and provides sightseeing Bay cruises with several daily departures on vessels that average a 400-passenger carrying capacity. The Red and White Fleet normally offers cruises out to the Golden Gate Bridge and around Alcatraz

Island, a “Bridge to Bridge” cruise that is similar to the Golden Gate cruise but travels farther south to the Bay Bridge, and, occasionally, a twilight cruise. Special event cruises (e.g., Fourth of July and private cruises) are offered as well. Both landside and waterside renovation plans are under way for the Red and White Fleet area, as described in Section 4.2 below.

3.2.2 Pier 43

The Project Area contains one historic resource, the Pier 43 Ferry Arch/Car Ferry Headhouse. The following is a description of the resource excerpted from the Cultural Resources Assessment prepared by Alta Archaeological Consulting (2020).

The Pier 43 Ferry Arch/Car Ferry Headhouse is within the Port of San Francisco Embarcadero Historic District (P-38-004890) and a contributing resource to the namesake National Register of Historic Places (NRHP) (District #06000372). Built in 1914, the headhouse originally consisted of two principal parts: (1) a portion of a pier or dolphin (marine structure that extends above the water level and is not connected to shore) that was built as part of a railcar ferry slip, and (2) a headhouse with a mechanism that once lifted a hinged ramp for the loading and unloading of railcars.

The pier originally had a car slip formed by two dolphins (east and west). Of its original features, only the headhouse remains on the rebuilt stub of the east dolphin, known as Pier 43. The architectural features of the headhouse were rehabilitated according to the Secretary of the Interior’s Standards in 2002–2003 after being damaged by fire in 1998.

The headhouse is a heavy timber structure that houses mechanical hoisting equipment. The structure consists of two towers spanned by a truss over a hinged ramp. On either side of the frame of the headhouse are small engine houses. By means of cables and wheels inside, the engines originally provided power to raise and lower the hinged ramp so that the ramp could be aligned with the deck of an incoming car ferry at varying tides.

The structure is clad in stucco and decorated as a neoclassical gateway. At the center is a round arched opening with a coved molding. The structure is articulated by a classical order with pilasters of quoins at the corners supporting an entablature with a dentilled cornice. The entablature is angled in a shallow gable over the center of the arch.

3.2.3 Pier 41½

The Blue & Gold Fleet provides regular ferry service to Sausalito, Tiburon, and Angel Island, and through its contract with the Water Emergency Transportation Authority (WETA), service to Vallejo, Alameda/Oakland, Harbor Bay, South San Francisco, and Richmond. Blue & Gold Fleet operates a fleet of 21 vessels. There are normally several departures per day.

3.2.4 Pier 39

Pier 39 is a 45-acre waterfront complex with about 15 million visitors annually. It first opened in 1987 and currently houses 14 full-service restaurants, 90+ retail shops, and attractions including the Aquarium of the Bay, a 5-acre waterfront park, and a 300-berth small craft marina.

3.2.4.1 Pier 39 West Basin

The Blue & Gold Fleet operates two regular cruise routes, with additional cruises for holiday and private events added occasionally. These Bay cruises depart from the Pier 39 West Basin docks. The San Francisco Bay cruise is a cruise around the Bay, and "Escape from the Rock" takes visitors around Alcatraz Island and back to the Pier 39 West Basin. Boat capacity ranges from 300 to 787 passengers. July and August are the busiest months for excursions, with June, September, and October also relatively busy.

California sea lions began occupying K Dock in the Pier 39 West Basin shortly after the Loma Prieta earthquake in October 1989. The sea lion population changes with the season, food supply, and natural migration patterns, but the all-time high population in November 2009 was 1,701 sea lions. The animals are protected by the Marine Mammal Protection Act, making it unlawful for unauthorized people to feed, handle, or harass them (Pier 39 2020).

The Pier 39 West Basin also hosts guest docking of boats up to 60 feet long and a small number of liveaboard boats (Pier 39 Marina 2020).

J Dock in the Pier 39 West Basin is home to seasonal commercial business including Adventure Cats, a charter sailing company that offers sailing trips as well as private charters. May through September is the busy season at the J Dock, and there are generally no daily sailing trips between the end of November and mid-February.

San Francisco Bay Boat Cruises is based out of I Dock in the Pier 39 West Basin and offers wine tasting tours and other excursions.

3.2.4.2 Pier 39 East Basin

The Pier 39 East Basin, comprising a 300-berth small craft marina, leases long-term and visitor boat slips, accommodating boats up to 85 feet long. The Pier 39 East Basin also leases a small number of liveaboard boat residents.

A Dock houses San Francisco Whale Tours and Empress Events luxury charter cruises. The whale tours operate year-round, offering whale tours, plus special tours for New Year's Eve and Fourth of July. Empress Events hosts up to 150 people on its luxury yachts. The easternmost pier at A Dock houses the America's Cup sailboat, which offers public and private charters from February through November.

A water taxi concession handles passengers throughout the day at B Dock.

B and C Docks host Emerald Lady and Bay Voyager excursions. These excursions operate year-round, depending on weather.

San Francisco Sailing Company out of F Dock is a sailing school and charter company with numerous boats operating year-round. It offers up to five sailing trips per day in addition to private charters and classes.

3.2.4.3 Upland Areas South of Piers 39 to 43½

The upland areas to the south of the Project Area are composed of densely developed commercial and residential areas (Figure 2-2). The location of the former Beach Street MGP, in the block bounded by Jefferson, Mason, Beach, and Powell Streets, is now occupied by a variety of commercial businesses, including the Hotel Zephyr, restaurants, and tourist shops.

3.2.5 Port of San Francisco Pier 96

Located on the Port's Southern Waterfront on the Bay, Pier 96 was developed in the early 1970s and used for container ships and handling operations until the late 1990s. Since the departure of container handling operations, the Port maintains vessel berthing capacity along Pier 96 and the adjacent wharf areas to support berthing use, non-container general cargo operations, and maritime public trust uses. A large portion of the adjacent Pier 94 terminal is used by Hanson Aggregates for vessel berthing, aggregate unloading, and dry bulk handling operations. Portions of the Pier 96 terminal are used by numerous maritime operators for vessel berthing, loading/unloading, and landside material staging and handling operations. Areas of Pier 96 are used for marine debris and construction demolition recycling and dredged material management and disposal. Portions of the Pier 96 terminal, to the south, include a steel warehouse used by Recology for the City and County of San Francisco's Blue Bin and commercial recycling; the Pier 96 Maintenance and Repair building; and Heron's Head Park, which includes the Eco-Center built in 2010.

Pier 96 is surrounded by other Port cargo terminals, facilities with access to freight rail, facilities to serve maritime and non-maritime uses, and the Illinois Street Bridge and highways.

The closest residential properties are approximately 0.5 mile to the southwest of Pier 96 off Keith Street and Middle Point Road. The Bayview neighborhood spreads out to the southwest beyond this point, with residential properties within 1 mile of Pier 96. Rise University Preparatory (an independent Christian middle and high school) is the closest school, located about 0.7 mile southwest of Pier 96 off Evans Avenue. Additional schools within a 1-mile radius include the main location of Rise University Preparatory on Galvez Avenue, KIPP Bayview Elementary, KIPP San Francisco College Preparatory, and the

Evans Center (part of City College of San Francisco). The area also contains one daycare center (Ideal Daycare on La Salle Avenue), and a few assisted living centers (CCHNC Providence Senior Housing, Northridge Cooperative, and Providence Senior Housing). However, none of these uses is located along the haul route to landfills, between Pier 96 and highways (Interstate 280 and U.S. Highway 101 [US101]).

3.2.6 Port of Oakland Berth 10

Berth 10 at the Port of Oakland is permitted for dredged material handling and management and is composed of asphalt and concrete. Surrounding land uses are all industrial, consisting of large warehouses, tug services, and ship loading operations. The western side of the berth is bordered by the Bay.

The nearest residential properties are the Station House Oakland Condos on Frontage Road between 16th and 14th Streets, about 0.7 mile southeast of Berth 10. Beyond this point, a large residential area extends to the southeast to Interstate 880. There are no daycare centers, schools, or nursing homes within a 1-mile radius, including along the haul route from Berth 10 to Interstate 880.

3.3 Remedial Investigations and Remedial Planning

3.3.1 Remedial Investigation

Haley & Aldrich prepared the Remedial Investigation Report under the oversight of the Regional Water Board (2017), to address the following objectives within the Project Area (Haley & Aldrich 2020a):

- Characterize the extent of PAH-impacted sediment
- Identify potential historical and ongoing sources of PAHs in sediment
- Evaluate potential impairment of beneficial uses of the waterway associated with PAHs in sediment
- Identify portions of the Project Area where remedial alternatives should be evaluated to address potential PAH-related impairment of the beneficial uses of the waterway.

Results presented in the Remedial Investigation Report suggested that site-specific impairment of the beneficial uses of the waterway may occur for bulk sediment PAH-25 concentrations between 100,000 and 400,000 μg/kg, with the weight of evidence suggesting the upper end of that concentration range is more likely. To be conservative, a bulk sediment PAH-25 concentration of 100,000 μg/kg was chosen as the site-specific screening threshold to preliminarily identify sediment response areas.

When evaluating future risk and preliminarily identifying the remedial response areas, the Port's current maintenance dredge permit bottom elevations and lateral boundaries (Regional Water Board 2014) were considered. The significance of those permitted dredge elevations and boundaries was to identify areas where dredging to permitted elevations, including the 2-foot overdredge allowance, could encounter conditions posing potential risk within the newly exposed post-dredge sediment surface or within a conservative depth beneath the newly exposed sediment surface.

Only those areas where PAH concentrations exceeded the screening threshold were carried through the feasibility study evaluation. The majority of the surface and shallow sediments with PAH concentrations greater than the screening threshold are found within five areas, deemed remedial response areas, encompassing nearshore areas between Pier 43½ and Pier 41½, on the eastern side of the scour area north of Pier 41½, in the southwest corner of the Pier 39 West Basin and along the western rim of the scour feature, and in the central and eastern portions of the Pier 39 East Basin.

A pre-design investigation (Haley & Aldrich 2020b) was conducted in 2020 to confirm the extent of concentrations of PAHs above the screening threshold and collect additional data to assist in development of the remedial design. The pre-design investigation did not result in any major changes to the understanding of the extent of contamination and did not alter the conceptual site model provided in the Remedial Investigation Report.

3.3.2 Feasibility Study/Remedial Action Plan

Haley & Aldrich prepared the FS/RAP under the oversight of the Regional Water Board (2020). Based on the results of the Remedial Investigation, the 100,000 μg/kg PAH-25 concentration in bulk sediment was chosen as the remedial action level (RAL), the following five remedial response areas, where the RAO will be applied, were identified (Figure 3-2):

- Area A—Pier 43½ offshore area and western limit of the response areas, just to the east of Pier 45
- Area B—Pier 43 offshore area
- Area C—Pier 41½ offshore area (Area C2) and the area under Pier 41½ (Area C1)
- Area D—Pier 39 West Basin
- Area E—Pier 39 East Basin. This is the eastern limit of the response areas.

Applying the RAO considers current shallow sediment, future shallow sediment that could become exposed by dredging, and the occurrence of PAHs above the RAL at any depth.

During the development of the FS/RAP, the Port initiated the renewal process of its Maintenance Dredge Program permits to reflect updated plans for periodic dredging of berths and piers along the Port's 7.5-mile jurisdiction. In an effort to reduce overall dredging, the Port identified berth and pier areas where reconfiguration is feasible such that either the overall dredge boundary and/or design depth has been revised.

Updates to the Port's 2014 permitted dredge plans for Pier 39 East and West Basins, Pier 41½ and Pier 45 East were developed by the Port and its tenants based on current and planned navigation and operational needs. As described in the FS/RAP, it is understood that these new dredge plans for Pier 39 East Basin, Pier 39 West Basin, Pier 41½, and Pier 43½ will be implemented in the near future. These new dredge plans, including revised lateral boundaries and bottom elevations, are referred to as operational use limits (OULs). These OULs are shown with the response area on Figure 3-2.

The FS/RAP evaluated three alternatives for each of the remedial response areas identified for remedial evaluation: (1) No Action; (2) Focused Dredge, Capping, Armoring, Monitoring, and Institutional Controls[2]; and (3) Maximum Dredge, Residuals Management, and Limited Capping, Monitoring, and Institutional Controls. These alternatives were individually evaluated and compared using several criteria, including overall effectiveness, implementability, estimated costs, regulatory and community acceptance, sustainability, and sea level risk resiliency.

The FS/RAP recommended remedial alternative 2, which satisfied the evaluation criteria, including compliance with specific plans and policies related to remediation and ability to meet the RAO. Only the recommended remedial alternative (Alternative 2) is evaluated herein, which achieves the RAO as follows:

- Dredging removes sufficient sediment to accommodate a cap and also allow for Port and tenant operational uses to continue.
- Capping effectively isolates contaminants to prevent bioaccumulation of PAHs and armoring protects the cap and ensures it will remain in place.
- Monitoring and ICs ensure the long-term effectiveness and protectiveness of the remedy.

The conceptual cap design is based on the approach outlined in the U.S. Environmental Protection Agency (EPA) "Guidance for In-Situ Subaqueous Capping of Contaminated Materials" (USEPA 1998) and "Contaminated Sediment Remediation Guidance for Hazardous Waste Sites" (USEPA 2005). The typical cap design process, as stated in EPA's guidance, consists of a three-component approach to designing a sediment capping system. The three components, and their purpose in the design, are described as follows:

- Physical Isolation—The function of this cap component is to act as a physical barrier to prevent direct contact between benthic organisms and/or potential future recreational users and the underlying contaminated sediment.

[2] Considers the current and future dredge footprints, or OULs.

- Chemical Isolation—The function of the chemical isolation cap component is to address the contaminant fate and transport processes occurring within the cap system over its design life, including advection, diffusion, and reaction.
- Erosion Protection—The function of the erosion protection component is to protect the cap materials from erosional forces exerted on the cap due to water currents and tides, wind currents, ice or debris scouring, and/or propeller wash.

As evidenced by the presence of existing soft sediment in portions of the remediation area, natural accretion is anticipated to take place following cap placement, leading to the natural re-establishment of benthic colonies in newly formed soft scape habitat areas. In addition, a habitat layer could be incorporated as part of the cap design, if required by the Agencies and could consist of:

- A sand layer placed above the capping system (referred to as a habitat layer) to promote accretion of fine-grained sediments and benthic recolonization.
- Additionally, in some locations the top layer of the cap may be modified to create a more structurally complex habitat (referred to as hardscape habitat) through installation of a mix of different sized stone and rock that create a variety of crevice sizes, thus providing shelter and/or foraging for fish of different sizes.

4 PROJECT DESCRIPTION

As discussed above, based on the results of the studies conducted for the Remedial Investigation and FS/RAP, which characterized the extent and magnitude of PAH-impacted sediments, five remedial response areas were identified. Overall, the Project is designed to minimize impairment of beneficial uses of the waterway by dredging and capping to address the RAO and ensure that Port and tenant operational requirements can be met within each remedial response area.

Specific remediation measures are proposed for each of the remedial response areas. These measures include dredging and/or capping, with erosion protection, as necessary. The remedial response areas depicted in Figure 3-2 are shown as polygons defined by the available sampling data. The actual remedial footprint would be refined during remedial design; the boundaries of the polygons will be adjusted as warranted constructability considerations.

The sections below describe the proposed remedial action and the overall approach and general methods for implementation of the action; more details are provided in the FS/RAP. Prior to implementation of the remedy, remedial design documents would be developed and provide a refined design for the remedy and more specific construction methods. The contractor(s) selected to implement the Project would further define remedy implementation means and methods. The approach and methods provided below contain enough detail to evaluate the potential impacts of the Project and develop mitigation measures. In certain places, assumptions have been made that encompass a "reasonable worst case" for the analysis of potential environmental impacts herein.

4.1 Overview of Proposed Remedial Action

The recommended comprehensive remedial alternative identified in the FS/RAP is Alternative 2: Focused Dredge, Capping, Armoring, Monitoring, and Institutional Controls, shown in Figure 3-2. This alternative includes the following components (described in more detail in the sections below):

- Removal of sediment with PAH concentrations greater than the RAL to depths up to 4 feet below the anticipated future maintenance dredging elevation within OULs and/or 3 feet below current sediment surface outside of OULs to accommodate cap and armor layer thicknesses.[3]
  - When removal has been completed, a cap and/or armor layer (where necessary to protect the cap from erosion) would be placed within removal areas to isolate potentially impacted sediment left in place (blue polygons in Figure 3-2).
  - This remedy would also include (1) placement of riprap (stone), where needed, within the existing shoreline riprap area where visual observation indicates riprap cover is missing; and (2) placement of a strip of armor to tie in the capping remedy to the existing shoreline riprap area (described below as the "shoreline zone erosion protection") (brown hatched area in Figure 3-2).
- Removal of sediments with PAH concentrations greater than the RAL without capping (yellow polygons in Figure 3-2).
- Installation of a cap (with an armor layer, where necessary) to isolate impacted sediment under Pier 41½ in Area C1, where dredge equipment access is limited or infeasible (tan polygons in Figure 3-2).
- Implementation and maintenance of ICs across all remedial response areas, including those areas where no dredging or capping is necessary (i.e., where impacted sediment remains in place underneath a sufficient layer of existing sediment cover; green polygons in Figure 3-2).

The remedy in all cases is designed to provide a layer of unimpacted material that serves as a protective barrier to any impacted sediments that would remain in place. The ICs, as well as a monitoring program, would ensure that the remedy remains protective. The following describes each of the basic components of the remedy (with additional details provided in each section below):

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[3] Following removal, a thin layer of clean material (likely sand) may be placed for residuals management (i.e., dredged sediment fines that may settle to the bottom of a completed dredge area) if capping does not immediately follow dredging or if capping is not required following removal (in areas where impacts exist underneath existing sediment cover or impacts are fully removed).

- **Dredging:** Physical removal of impacted sediment (and debris) using dredges (e.g., clamshell, conventional bucket, or environmental buckets), which requires dewatering. Micro-hydraulic dredging (e.g., handheld suction hose by divers to hydraulically remove sediments) could be used in small areas inaccessible by other dredging technologies (e.g., under the piers/wharfs along the seawall/shoreline structure).
- **Capping**: Physical/chemical isolation of impacted sediment by placing clean material on the existing sediment or post-dredge surfaces. The cap can have multiple layers and would be constructed based on engineering analysis of chemical isolation and other factors. Cap layers and thicknesses (Figure 4-1) would be defined during the remedial design phase of the Project. As discussed in Section 3.3.2, "conventional" caps can consist primarily of natural materials (e.g., sand) but additional cap components/layers may include:
  - **Reactive Cap**: Enhancement of conventional cap materials using reactive amendments, such as activated carbon or organoclay, to reduce and/or impede chemical transport through the cap.
  - **Armoring**: Structural elements (e.g., stone, marine mattresses), as necessary, that would be used to protect the cap from damage by erosion, scouring, heavy equipment, or other forces.
- **Shoreline Zone Erosion Protection:** Placement of a strip of armoring along the shoreline zone adjacent to the soft sediment (i.e., where there is a gap between the existing shoreline armor and adjacent remedial areas subject to dredging and/or capping) to tie in the capping remedy to the existing shoreline zone habitat and addition of stone to the existing shoreline riprap revetment where visual observation indicates existing hard cover is missing.
  - Within an approximately 20-foot-wide strip (covering an area of approximately 30,000 square feet) parallel to the shoreline, armoring would be placed to transition the capped/armored remedial response areas into the existing shoreline zone revetment (brown cross-hatched area identified as the "transition zone" in Figure 3-2).
  - The shoreline zone is bounded landward by the seawall and bayward by existing debris/riprap revetment. The existing revetment (riprap), which covers approximately 147,000 square feet, reduces the potential for erosion of underlying fill material into the ferry terminals and marinas. Within this shoreline zone, there are small areas, estimated to be approximately 400 square feet, where riprap is visibly deficient; these "bare spots" would be filled in with riprap.
- **Institutional Controls**: ICs would likely include restrictions on site activities and uses such as the maritime uses contemplated in the Port's definition of the operational uses. ICs could include restrictions on the use of anchors in select areas,

creation of no-wake zones, and limits to future maintenance dredging beyond the currently anticipated OULs.

The following are additional assumptions and details regarding Project components:

- Temporary containment structures, turbidity curtains, and/or other sediment transport barriers would be required to isolate the area to be dredged from the rest of the work area and prevent adverse impacts on water quality and contamination of adjacent areas during removal.
- Debris and remnants of historical piers are present within the Project Area. Where applicable, debris would be removed prior to or concurrent with dredging operations primarily in areas subject to remediation.
- Removal in Area E would necessitate the replacement (or removal and temporary storage) of floating docks to facilitate access to the areas to be dredged. There may be a need to move or remove and replace some docks or other infrastructure in other remedial response areas to gain access, but that is expected to be minimal. There also may be a need to improve erosion protection around the combined sewer overflow outfall located at Pier 39 East.
- To protect the integrity of existing structures during dredging and capping, a buffer (i.e., a "safe offset") would be established around the structures (e.g., piers, seawall, breakwaters, fishing pier in Area C). The remedial design would evaluate slope stability near these structures, and refine offset buffers and/or sloping requirements to mitigate damage to these structures during construction and under post-construction conditions. It is possible that temporary sheet pile would need to be put in place to protect structures.
- Within the offset buffers from structures, where necessary to address impacts in the surface sediments, best efforts would be made to remove up to 3 feet of sediment. The extent of dredging would depend on obstructions caused by the adjacent structure and/or the need to protect the structure's integrity.
- Where applicable, the OUL represents the outer edge of the removal footprint and provides a starting point for excavation slopes from the top down.
- Dredging side slopes are assumed to be 3 (horizontal):1 (vertical) for areas where 3 feet or more of dredging is identified. These slopes would be further assessed during remedial design. Capping and armoring would extend up the slope to prevent contaminated sediment exposure at boundaries of the dredge extent. Removal areas with less than 3 feet of elevation change from the surrounding grade are assumed not to require sloping.
- A 6-inch overdredge allowance (see glossary) to account for differences in the accuracy of dredging; it is assumed that some dredging beyond the design dredge depths could occur across the footprint of the proposed removal limit, and this additional volume is included in the volume estimates.

In some areas, vessel operations have induced scour below dredging elevations. Where scour holes are below the OUL-specific elevations, capping and/or armoring could be installed without dredging. No removal is assumed for scour holes or for sediment areas where the existing grade is more than 3 feet below the allowable OUL-specific removal depth, because the scouring has created sufficient clearance to accommodate an engineered cap that would remain below the OUL elevation. In addition, areas with sediment below the RAL within 3 feet below the estimated dredge may require only placement of backfill material for grading purposes (i.e., to transition to the surrounding grades) rather than chemical isolation.

Final remedial response area boundaries and elevations (i.e., dredge prisms) and the cap and/or armor thickness requirements and composition would be refined and determined during the remedial design phase based on the results of additional pre-design investigations and constructability considerations.

The estimated removal volume (which includes debris) and cap/armor volume for each remedial response area are shown in Table 4-1 below. The total dredging and debris removal volume is assumed to be 100,000 cubic yards (cy) or less, and the total amount of cap/armor material installed would be approximately 52,000 cy. Volumes will be refined during the design process.

The Project would not result in any net fill because the overall Project removal volume would significantly exceed the fill installed (by approximately 35,000 cy, a net loss of fill). In Area C, there is a "net fill" estimated due to the placement of the cap directly over the sediment surface (i.e., no dredging/removal) in the under-pier area, Area C1. The total area that would be disturbed by work activities including removal and capping/armoring activities is approximately 10 acres.

Table 4-1. Approximate Quantities and Areas for Remedy Components

Description	Area A	Area B	Area C1	Area C2	Area C Subtotal	Area D	Area E	Total
				Volumes (in cy)				
Dredging & Debris Removal	10,000	5,500	0	13,000	13,000	8,000	51,500	88,000
Cap/Armor Installation	5,500	5,000	3,500	10,000	13,500	6,500	21,000	51,500
Shoreline Erosion Protection	140	150	880	230	1,110	210	90	1,700
Net Fill Volume	*–4,360*	*–350*	*4,380*	*–2,770*	*1,610*	*–1,290*	*–30,410*	*–34,800*
				Areas (in acres)				
Dredge/Cap/Armor	0.8	0.8	--	1.3	1.3	0.7	4.1	7.7
Cap/Armor Only	0.02	--	0.7	0.2	0.9	0.3	0.2	1.4
Shoreline Erosion Protection	0.03	0.1	0.3	0.06	0.4	0.06	0.08	0.7
Total Fill Area	*0.85*	*0.9*	*1*	*1.56*	*2.6*	*1.06*	*4.38*	*9.8*
Removal Only	--	0.2		0.07	0.07	--	--	0.3
Institutional Controls	0.2	0.2	--	1.5	1.5	0.5	1.6	4.0

Definitions:

- Dredge & Debris Removal Volume: The sum of material that would be removed (i.e., dredged) from each area (the yellow polygons and a portion of the blue polygons in Figure 3-2). Debris volumes are estimated to be approximately 21,000 cy of material within the total removal volume (21 to 34 percent of each area, site-wide average of 24 percent of all removal).
- Cap/Armor Installation Volume: The sum of the volume of cap materials (clean sand, amendments, and armor where needed) that would be installed in each removal area (the blue and tan polygons in Figure 3-2). Includes Area C1 where removal would not be performed but a cap is required.
- Shoreline Erosion Protection: The volume of fill material for the shoreline erosion protection portion of the remedy (brown cross-hatched “transition zone” in Figure 3-2), which includes placement of a strip of armor over approximately 27,000 square feet. The armor placement area would be refined during the design process.
- Net Fill: The difference between the Removal Volume and the Cap/Armor Volume. A negative number means more material is being removed than placed.
- Dredge/Cap/Armor Area: The surface area for each area where (1) dredging would occur, (2) a cap, which may include armor, would be installed, and (3) ICs would be administered (a portion of the blue polygons in Figure 3-2).
- Cap/Armor Only Area: The surface area for each area where a cap only (without removal), which may include armor, would be installed. These areas are predominantly under docks (the tan polygon, Area C1, in Figure 3-2), where the performance of removal is not feasible, and scour areas where a cap/armor would be placed with no pre-dredging beforehand (a portion of the blue polygons in Figure 3-2).
- Total Fill Area: Sum of Dredge/Cap/Armor acreage, Cap/Armor Only acreage, and Shoreline Erosion Protection acreage.
- Removal Only Area: The surface area for each area where only removal (i.e., dredging) would occur (i.e., no cap is necessary) and ICs would be administered (yellow polygons in Figure 3-2).
- Institutional Controls Area: The area in which only ICs would be administered to ensure protectiveness.

Notes:

- Total column = (A+B+$C_{subtotal}$ +D +E).
- Table does not include fill area and volume for replacing deficient riprap in the existing riprap area along the shoreline (approximately 29 cy over 400 square feet).

A majority of dredged material (and debris) removed from the Project Area would be transported by barge to the MHF, dewatered and conditioned, properly characterized, and loaded into trucks for disposal at a licensed landfill. A limited quantity of material from Area E is likely to qualify as suitable for beneficial reuse or would be clean enough to be disposed of at the San Francisco Deep Ocean Disposal Site (SF-DODS). Sediment handling and disposal options are discussed in more detail below. Following the completion of work, there would be equipment demobilization and restoration of the Project Area and MHF.

A number of plans, control measures, and avoidance and minimization measures would be required to limit the impact of the remediation on biological resources, water quality, air quality, and public health. Post-remediation monitoring would be required to verify remedy effectiveness and permanence. The plans and control measures are discussed in Section 4.10 and compiled in Attachment A.

4.2 Construction Schedule

Remediation is proposed to occur in phases, over a 5- to 7-year period. The construction schedule provided below (Table 4-2) shows work proceeding from west to east along the waterfront, where each remedial response area would be constructed in 1 year or less, except for Area E, which could take up to 2 years. Construction is planned to begin in 2023 to accommodate the planned Red and White Fleet waterside renovation plans. If the planned start dates and sequencing are maintained, the recommended remedial alternatives would be completed in 2029.

Table 4-2. Estimated Construction Schedule

<table>
<tr><th>Year</th><th>Estimated Calendar Year</th><th>Primary Area</th><th>Secondary Area</th><th>Additional Notes</th></tr>
<tr><td>1</td><td>2023</td><td>Area A</td><td>Area B</td><td>Area A is scheduled first to accommodate the planned Red and White Fleet berth expansion. Area B planned for same season due to size and proximity to ferry operation locations.</td></tr>
<tr><td>2</td><td>2024</td><td>Area C</td><td>Area D</td><td>Area C is scheduled for the second year to minimize future disruption near ferry operation locations (Area A, Red and White Fleet, and Area C, Blue & Gold Fleet). Prioritizing the completion of Area C over Area D will enable the completion of work between the two main ferry operation locations as well as completion of the planned remedial areas west of the breakwater that defines the Pier 39 West Basin.</td></tr>
<tr><td>3</td><td>2025</td><td colspan="2">Alternate Project</td><td rowspan="2">No work is scheduled during these years. Given the anticipation of a separate sediment remediation project that may need to use the MHF, the current sequencing includes a 2-year placeholder preventing work at the Project Area to accommodate the other project.</td></tr>
<tr><td>4</td><td>2026</td><td colspan="2">Alternate Project</td></tr>
<tr><td>5</td><td>2027</td><td>Area D</td><td>Area E</td><td>Areas east of the breakwater that defines the Pier 39 West Basin would have priority after the 2-year placeholder.</td></tr>
</table>

Year	Estimated Calendar Year	Primary Area	Secondary Area	Additional Notes
6	2028	Area E	None	Given the volume of material anticipated to be dredged in Area E, the work in that area would be split into two phases spread out over two construction seasons.
7	2029	Area E	None	If Area E is complete in 2028, work in Year 7 would not be needed.

Notes:

- Primary Area: Area that would drive the schedule for the designated year.
- Secondary Area: Area that would be started, or completed if started during the prior year, if time is available after completion of the Primary Area.

Ultimately, the quantities of dredging and capping and the associated logistical constraints for each remedial response area would dictate the sequence for addressing each area and the construction duration for each phase. Remedial work could be expedited in other ways, with some remedial response areas combined within a single construction season/year; others could take more than 1 year to complete. The maximum activities that could be performed in a single year can be represented by combining Areas B and C into a single year/construction season. This maximum scenario would represent the maximum intensity of work, trucking and hauling trips, equipment usage, and workdays.

Upland work can take place year-round. As such, site preparation and improvements to the MHF would start earlier than 2023. Other activities, such as material acquisition and contractor document submittals, may occur prior to mobilization. However, in-water work is generally restricted to "work windows" for the Bay, which run from June 1 through November 30 each year to protect sensitive species (USACE 2020a). Some in-water construction activities may be authorized (during the permitting process) to take place outside the in-water work windows. These activities include but are not limited to:

- Installing protection for structures, establishing staging areas, and deploying navigation aids
- Removing, relocating, and/or replacing docks and other infrastructure
- Removing piles, installing piles to support turbidity control features, and replacing piles[4]
- Placing backfill, riprap, and/or armor in some areas

To implement the remedy, current berthing, vessel traffic and other tenant uses (primarily tourist excursions and ferry service) would need to be temporarily halted for certain periods or modified in phases to facilitate safe equipment access and remedy implementation logistics. Construction impacts would be minimized by temporarily

[4] Vibratory methods may be utilized outside the herring spawning season (between December 1 and March 15). Year-round work assumes the California Department of Fish and Wildlife is able to issue a herring waiver and herring spawning is not observed. All impact pile-driving would need to be conducted within the work windows. Control and avoidance and minimization measures are provided in Attachment A.

relocating ferry operations and excursions to alternate piers and/or modifying schedules. In Area E, portions of the Pier 39 East Basin would be affected; vessels that berth within the dredge area and adjacent areas needed for equipment access would need to be relocated during construction. Minimal impacts on access to the Pier 39 West Basin slips are expected.

As discussed above, some in-water construction activities would likely be restricted to 6-month work windows (June 1 to November 30). Other work that takes place primarily in the upland environment, including site preparation and sediment management, as well as some limited in-water work could proceed outside the work windows if approved by the permitting agencies. Table 4-3 provides an estimated schedule for a typical construction season by work phase.

Table 4-3. Typical Year Construction Phase Schedule

Phase	Start Month	Finish Month	Duration (months)
Mobilization/Site Preparation	March	July	5
Sediment and Debris Removal	June	October	4
Backfilling/Capping/Armoring	July	November	4
Sediment Dewatering/Conditioning	July	December	5
Transportation/Disposal	July	January	6
Demobilization	December	February	3–6

Work is assumed to take place Monday through Saturday (6 days per week) for 10 hours per day, on average. Hours would generally be 7 a.m. to 6 p.m. (10 working hours per day) but some work could occur after hours and/or during nighttime, with appropriate permits and approvals. See Section 4.9 for more details.

4.3 Remedial Design

As part of the remedial design process, several pre-design studies would be required before construction begins. Likely pre-design studies would include but are not limited to the following:

- Surveys on land and in water, as well as structural and existing condition surveys
- Additional sediment sampling and geotechnical analyses[5]
- Sediment stability testing

[5] Sediment investigations often require push/vibratory methods. Geotechnical test borings could require sonic drilling and impact hammer techniques.

- Hydrodynamic studies, including the collection of information on winds and waves (e.g., velocity profilers or water pressure sensors)
- Hydrodynamic, cap, and scour modeling
- Treatability study(ies) for sediment dewatering/decant water discharge evaluations
- Borrow source evaluation, including cap source identification and geotechnical and chemical analyses
- Capping and sediment partitioning study (for cap effectiveness and performance)
- Waste characterization testing to assess disposal options.

The final remedial design is not likely to vary significantly from that described herein and would be subject to approval by the Regional Water Board and the permitting agencies (see Section 4.9) prior to implementation.

4.4 General Implementation Sequencing

The sequence of implementing the remedial action elements is anticipated to include the following general elements (described in more detail in the sections below):

- Preparing management areas for dredged material and debris processing (licensed area within the Port's Pier 96 or the Port of Oakland's Berth 10). This work may include various improvements.
- Mobilizing dredging equipment and infrastructure.
- Installing temporary enclosures (containment booms, silt curtain or similar along with temporary piles to support, as needed) to facilitate dredging and cap placement and minimize the release and resuspension of contaminated sediment.
- Infrastructure management activities (e.g., pile removal, moving docks).
- Performing pre-dredging demolition and debris removal.
- Dredging sediment within the dredge limits and transporting the dredged materials via barge scows to the MHF for dewatering and conditioning.
- Installing slope stabilization.
- Importing, handling, and processing capping materials.
- Transporting and placing capping materials.
- Completing progress surveys (at stages of the dredging and cap placement) and final as-built surveys.
- Managing dredged material to dewater and condition it for transport.
- Loading and transporting dewatered sediments and debris to an offsite landfill.

- Restoring the Project Area and MHF area, including temporarily closing the MHF between construction seasons, and restoring it at the conclusion of sediment remediation.

4.5 Site Preparation

For each phase of construction, the following site preparation activities are anticipated (see additional details in FS/RAP Section 10.4):

- Acquire materials and mobilize.
- Prepare or maintain staging areas for materials and supplies and support areas for personnel.
- Prepare or maintain the MHF (including any water treatment and stormwater controls), stockpile areas, loading areas, truck ingress and egress, decontamination areas, etc. (see additional details in Section 4.7 below).
- Establish areas for barge and equipment staging.
- Protect structures.
- Improve site access, including temporary removal or relocation of floating docks and other structures.
- Place security controls (i.e., fencing) to restrict public access, as needed, and place wildlife protections as needed.
- Remove marine debris and piles, and install temporary piles and turbidity curtains.

Preparation of the landside staging area would include constructing staff parking (existing lots would be used where available), establishing access, and staging construction equipment and material. Planned staging areas are anticipated to occupy a total of approximately 6 to 8 acres. Staging will take place at Pier 96, and other ancillary facilities within the Port's jurisdiction under a lease agreement between PG&E and the Port. In-water staging would be areas for barge and other waterside equipment anchoring.

Potential construction components associated with turbidity curtain installation include, but are not limited to, anchor barges, submerged anchor points, and temporary steel piles. Temporary piles would be driven at key locations around each remedial response area to facilitate installation of turbidity curtains. The piles, along with temporary anchoring locations (such as an anchor barge), would be installed to allow for shifting curtain configurations as work progresses through each area. These temporary piles associated with turbidity controls would be removed upon completion of work. No permanent piles would be added to the site as part of the Project; all "new" piles would be temporary. Up to 50 temporary piles would be installed for the turbidity curtains; up to 50 fender piles would be installed as part of improvements at Pier 96.[6] Given the nature of the project and current state of the design, it is difficult to define the pile type. Possible pile types include wood, steel, composite, and concrete.

Removal of existing piles would be necessary where existing piles may interfere with dredging access (this will be minimized) or for debris removal (i.e., as compensatory mitigation). Piles (concrete, steel, or wood) that may be removed and reinstalled include those within dredge prisms and additional piles within the "buffer zone" (defined as a "safe offset" from structures). Approximately 859 piles are within the work area and buffer zone, but the majority of these would be left in place as they include piles that provide structural support for the piers. Approximately 226 wood piles within Area E may need to be temporarily removed to facilitate remediation and replaced[7] after dredging is completed and before or during cap placement. The total number of piles that would need to be removed, as well as the number of temporary piles that would need to be installed, would be refined based on the final remedial design.

In general, vibratory methods would be used to remove piles; both vibratory and impact hammer methods will be considered to install piles, although alternative methods (only if deemed suitable and approved by the resource and permitting agencies) may also be considered. In other cases, when complete pile removal is not feasible, piles may be cut at the mudline and not completely removed.

4.6 Construction Methods

With the exception of sediment handling/conditioning and offsite transport, construction activities would primarily be conducted from the water. Some work could take place from land adjacent to the Project Area, but only where access from the water side is not possible. The amount of work conducted from the land would be minimal and short in duration to minimize any impacts on tenant uses and public access.

In-water staging of construction equipment and material would occur on barges temporarily moored adjacent to the proposed remedial areas. A crane would be onsite to facilitate unloading of any large and/or heavy equipment or materials. More details on construction methods are provided in the FS/RAP and would be refined during remedial design and by the contractor.

[6] This work could be completed separately under an existing permit or under a separate permit from the remediation as part of overall facility improvements.
[7] Some existing piles are creosote-treated. Replacement piles would be made of an acceptable product (not creosote or treated piles, unless of a type seemed suitable and approved by the resource and permitting agencies). See Attachment A for details.

4.6.1 Dredging Activities

Sediment removal would be performed using mechanical dredging. Depending on logistical needs, mechanical dredging would be performed in open-water areas and would occur primarily from water-based equipment consisting of a barge-mounted crane or excavator, typically outfitted with an environmental clamshell bucket when feasible. For dredging of contaminated sediments, environmental or closed buckets are used to minimize the loss of sediment upon bucket retrieval, thus minimizing the loss of excavated materials to the water column. Mechanical dredging equipment removes sediment near its *in situ* condition; however, in so doing, some additional surface water can be entrained within the bucket, especially for shallow dredge cuts. Sediment would be placed into barge scows, with excess water entrained, and transported to a restoration project site for beneficial reuse or to the MHF area for handling, dewatering/conditioning, and landfill disposal (see additional discussion below).

Sediment removal underneath piers, wharves, and overhanging docks with minimal clearance would likely require specialized equipment. Diver-assisted micro (hydraulic) dredging, land-based excavation using a mini-excavator, and/or manual labor could be used to perform removal in areas beneath docks, piers, or wharves that are inaccessible to water-based mechanical dredge equipment. In such cases, sediment would be removed and deposited into barge scows and transported to the MHF for handling and disposal.

4.6.2 Debris Removal

Debris removed before or during dredging operations would be loaded into a debris barge and transported to the MHF, where it would be offloaded, sorted and processed for recycling or landfill disposal. The surface area with observable surface debris varies by remedial response area; for example, there is a large “debris field” at Area B (approximately 30,000 square feet), whereas Area D has very little observable surface debris (less than 1,500 square feet). As noted in Table 4-1 above, debris volume is estimated to be approximately 21,000 cy of the total removal volume.

4.6.3 Capping and/or Armoring

Cap materials would be placed using barge-mounted cranes or excavators, using broadcasting equipment (e.g., conveyors, impellers), or by pumping as a slurry, depending on access. Mechanical placement with excavators or cranes would allow cap material to be lowered through the water column before the material is released, in order to control water quality impacts (e.g., increase in turbidity). Mechanical placement in this fashion may also enable thinner and more evenly distributed lifts of cap material to be placed. Cap materials may also be released mechanically at the water surface. In these instances, special considerations would be made to decrease the rate of release and monitor any changes in water quality. Material broadcasting or slurry-based technologies would allow capping materials to be deployed under piers, docks, wharves, or other limited-access areas.

Capping over Area C1, where necessary, would be conducted by hand during low tide and/or by broadcasting/slurry methods. In the unlikely event that the pier and structures overhead of Area C1 are removed before implementation of this remedial action, the area would instead be addressed similar to the other remedial response areas (i.e., through removal, with or without capping and/or armoring after removal). Installation of capping material without dredging may result in fill placed above the high tide line or mean high water, although this is unlikely.

The conceptual cap design elements, including materials and thicknesses, have been evaluated using a model to simulate cap performance and evaluate conceptual sediment cap compositions and thicknesses. Conventional surface cap material options include granular cap media (e.g., sand), bay mud, and/or beneficial reuse of clean dredged materials from the Bay, which are generally a mixture of bay mud and coarser grained sediments (silts and sands). Engineered cap layers could include synthetic and/or reactive materials (e.g., granular activated carbon), where needed. An evaluation would be conducted during the design process to evaluate preferred/suitable capping materials, including chemical testing in accordance with the California Department of Toxic Substances Control (DTSC) "Information Advisory, Clean Imported Fill Material" (DTSC 2001b) and the Regional Water Board's draft staff report "Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines" (Regional Water Board 2000).

Information collected during this evaluation would be used in the engineering evaluation of the cap layers and cap placement and construction considerations. The availability of borrow sources may depend on the timing of the construction projects and may dictate subsequent evaluations performed closer to construction.

Model results presented in Appendix D of the FS/RAP suggest that a cap with a chemical isolation layer consisting of 6 inches of sand amended (i.e., blended/mixed) with 1 percent granular activated carbon will effectively isolate PAHs for at least 100 years in each of the areas, except for a portion of Area B, which may require a higher percentage of the reactive component. Isolation capping requirements and compositions, as well as placement techniques and thicknesses, would be further evaluated in the remedial design. Figure 4-1 shows options for cap design, including the isolation layer and erosion protection features.

A preliminary scour assessment was performed to assess the materials necessary to withstand anticipated erosive forces at the Project Area such as tidal flow, wind and wave action, and propeller-generated scour. In this instance, propeller-generated scour is preliminarily considered to be the greatest influence warranting armoring. The results suggest that armoring will effectively protect against erosional forces in the Project Area with only minimal armor stone movement required outside of the propeller-generated scour areas; underlying capping materials would be protected and maintained in place. The scour modeling would be refined in the remedial design process.

The surface sediment in many of the remedial response areas is disturbed as a result of vessel scour and other erosive forces, except in Area E and portions of other areas, which are relatively undisturbed. A habitat layer will be incorporated into the final cap layer where necessary, required by the agencies as part of the permitting process, and where feasible.

4.6.4 Slope Stabilization

Based on pre-design investigations, field observations, and preliminary geotechnical evaluations completed in support of remedy design, slope stabilization will be necessary in certain areas of the Project. An analysis of the existing sediment characteristics and strength properties suggests that when modeled with design level seismic forces, select dredged and capped areas may be prone to either rotational or sliding failure. A method known as "soil pinning" could be used to promote slope stability pending further design evaluations. If warranted, as part of the design process, soil pinning would include the installation of an array of approximately 12-inch-diameter tapered piles (e.g., timber) at approximately 7-foot centers across the face of select areas of the slopes to improve the connection between the various soil horizons and tie the slope to deeper sediment units with improved strength. These permanent piles would be installed vertically to a depth of approximately 50 feet below the post-dredge surface elevation, using impact or vibratory methods. The piles would be driven such that the butt (or top) of the pile would be embedded below the post-dredge surface before placement of cap materials and armor stone. The top of the pile would be 3 to 4 feet below the finished elevation of the restored bay floor. Preliminary design estimates suggest up to 1,200 piles (installed across the construction period) may be necessary. Final installation details, material types, and total pile counts will be developed during the design process.

4.6.5 Shoreline Zone Erosion Protection

As discussed above, the existing revetment reduces the potential for erosion of underlying fill material and sediment into the ferry terminals and marinas, and also provides the epibenthic habitat that is predominant in the shoreline zone. Portions of the shoreline zone are under structural piers, wharves, and overhanging docks. A photographic survey identified deficiencies in the riprap revetment. Suitably sized riprap would be added only in those areas where visual observation indicates the fill/sediment underneath is exposed (Figure 4-2).

After the removal and capping in the remedial response areas, there would be a gap between the edge of the removal/capped areas and the existing shoreline revetment. Where there is a gap, armor (i.e., riprap) would be placed over exposed sediment to tie the sediment remedy areas to the existing shoreline revetment (Figure 4-3). The methods for placement of the erosion protection would be the same as those described for capping.

4.6.6 Other Considerations

Because the response areas are located within areas of active commercial and recreational uses (e.g., ferries, excursions, recreational boating), the remedial work would disrupt activities within these areas. Ferry and excursion vessel operations would be affected, which could require either modifications to ferry and excursion vessel schedules or temporary relocation of these operations. Some infrastructure associated with the commercial vessel operations (e.g., docks, gangways) may need to be temporarily removed and either relocated or stored during the remedial activities to allow access by construction equipment.

Recreational boating would be affected as well. Some piles would need to be removed and docks and gangways floated away temporarily. Boats berthed in these areas would need to be relocated during the remedial activities.

These areas would require restoration after the remedial actions are completed. Any infrastructure (including piles) damaged or removed during the project would need to be repaired or replaced.

Work on land is not anticipated, but protective barriers (e.g., fencing) may be placed along the waterfront to provide a barrier for entry to work areas.

4.7 Material Handling and Management

Most of the dredged material is not anticipated to be suitable for beneficial reuse or aquatic disposal, but would instead be placed into barge scows and transported to the MHF for handling/conditioning and eventual disposal at a landfill. Any dredged sediment managed through disposal at SF-DODS or beneficially reused would be directly barged to the site for disposal or reuse.

Because of the relatively minor volumes of sediment associated with Areas A, B, C, and D that are anticipated to qualify for beneficial reuse or disposal at SF-DODS, coupled with the difficulty in accessing, segregating, and handling such small volumes based on its location and depth, it is assumed that alternate disposal options are feasible only for Area E. Based on the extent of areas and thicknesses of material that appear suitable for beneficial reuse or disposal at SF-DODS, it is assumed that 20 percent of Area E removal volumes may qualify. During the remedial design, additional disposal options would be evaluated, and the remedial design would consider the feasibility of the *in situ* segregation of Area E sediment that could be suitable for beneficial reuse or disposal at SF-DODS.

Sediment not suitable for beneficial reuse, or those materials that qualify for beneficial reuse but are too closely comingled with non-beneficial reuse materials, would be transferred to the selected dredged material management area, dewatered, and transported to a landfill for disposal. Once at the MHF, dredged material and debris would be segregated by type and waste classification. Sediment to be disposed of at an upland landfill would be dried and amended, as necessary, with Portland cement or similar additive; stockpiled; loaded into trucks; and transported to the appropriate offsite disposal facility, based on its waste classification. Decant and dewatering effluent would be collected, tested, treated (if necessary), and disposed of appropriately (i.e., under permit) through discharge to the sanitary sewer, discharge to the Bay, and/or transport and disposal offsite. Debris would be preferably recycled (if it meets requirements) or otherwise disposed of at an appropriate landfill.

As discussed above, staging and material management and handling activities are anticipated to take place at the Port's Pier 96 (Figure 4-4). As an alternative, handling activities may take place at the Port of Oakland's Berth 10 (Figure 4-5). If Berth 10 is used for handling, staging would still be at Pier 96 and/or other ancillary facilities within the Port's jurisdiction under a lease agreement between PG&E and the Port. The location(s) for sediment management could depend on availability of the offsite facilities at the time of the work. However, based on the condition, layout, and size of potential transload facilities, Pier 96 would be preferred. Additional evaluation of potential transload facilities would be conducted during the remedial design.

4.7.1 Debris Management

Marine debris and remnants of historical piers are present in portions of the Project Area. Where applicable and feasible, marine debris (i.e., wood, concrete, metal) would be removed before or during dredging operations and managed at the MHF using the same material processing equipment and dewatering pads as used for sediment. Debris would be segregated and decontaminated (i.e., cleaned such that it is suitable for reuse), if possible. Decontaminated debris would be staged for disposal at an appropriate facility. Concrete and metal debris would be decontaminated and recycled if feasible.

4.7.2 Sediment Dewatering and Conditioning

Sediment removal methods identified in the FS/RAP primarily consist of mechanical dredging. Mechanical dredging methods remove sediment at near *in situ* water content, although some additional surface water is entrained as a result of incomplete bucket fill during the dredging activity. Selected process options for sediment dewatering and conditioning include gravity dewatering and addition of a dewatering amendment to aid dewatering and to improve strength characteristics. The selected landfill(s) would determine acceptable moisture content of the materials. Bench-scale testing of sediment dewatering may be conducted as part of the remedial design to assess effectiveness of various dewatering amendments and recommended amendment dosage for achieving landfill requirements. The approach to gravity dewatering and conditioning depends on the amount and layout of space for dewatering operations.

Differences in sediment dewatering, conditioning, and water treatment operations at the Berth 10 facility and Pier 96 are discussed in the sections below.

4.7.2.1 Pier 96

Pier 96 would offer larger and less constrained space for sediment handling operations. Following offloading of sediment from barges to the upland area, sediment would be transported to a dewatering pad. Sediment would be placed within segmented cells constructed of prefabricated concrete blocks and allowed to gravity drain. Dewatering cells would be constructed to allow for 5 days of dewatering based on the anticipated dredge production rate. During the dewatering process, sediments may be mechanically dewatered ("farmed") using dozers, loaders, or similar equipment. Dewatering amendment (e.g., Portland cement, cement kiln dust, or quicklime) would be used in small percentages, as needed, to further enhance drying. Figure 4-6 presents a conceptual layout of a dewatering and conditioning pad at the Pier 96 facility.

Although Pier 96 berthing, wharves, and terminal areas are maintained and used for maritime operations, some improvements to the infrastructure may be needed, including in-water work, which could require driving of fender piles. These improvements would need to be made prior to the initiation of remedial work and have utility beyond the scope of the Project. It could therefore be completed separately under an existing permit or under a separate permit from the remediation, as part of overall facility improvements.

4.7.2.2 Berth 10

The current condition of the Berth 10 transload facility would provide a limited area for sediment dewatering and conditioning and improvements (i.e., infrastructure upgrades to the facilities would likely be necessary). Following offloading of sediment from barges to the upland, sediment would be transported to a dewatering pad. Sediment would be placed within segmented cells constructed of prefabricated concrete blocks and allowed to gravity drain. Due to space constraints, a faster sediment throughput would be required to accommodate dredging activities. Therefore, dewatering amendment (e.g., Portland cement, cement kiln dust, or quicklime) would be used, as needed, to further enhance drying. Higher quantities of dewatering amendment may be required to maintain the desired throughput. Figure 4-5 presents a conceptual layout of a dewatering and conditioning pad at the Berth 10 facility.

4.7.3 Decant Water Treatment

Decant water generated during sediment dewatering would be collected, stored, and, as required, treated by a temporary wastewater treatment system established at the MHF. The following are permits that may be required:

- National Pollutant Discharge Elimination System (NPDES) Permit—Needed for water discharges related to processing of treated water discharged directly to the Bay, which could be conducted under the General Permit (Order R2-2015-0035, NPDES Permit CAG982001) for discharges from aggregate mining, marine sand washing, and sand offloading facilities; the general permit may apply for decant water produced during sediment dewatering processes to surface waters, or an individual permit may be required.

- Spill Prevention, Control, and Countermeasure Plan—May be needed to outline the activities that would be undertaken to prevent spills or in the event of a spill at the MHF.
- Waste Discharge Permit—Would be required if decant water is discharged to the sewer. The SFPUC issues Wastewater Discharge Permits for industrial operations and Batch Wastewater Discharge Permits for activities that generate non-routine, episodic, or other temporary discharges through non-industrial processes.

Where discharge back to the Bay or to a sewer is not possible, treated water may be transported offsite for disposal.

4.7.4 Transportation to Landfills

4.7.4.1 Waste Characterization

A waste profile would be generated using representative waste characterization data as required by the selected disposal facilities. The frequency of sampling would be determined based on landfill requirements. Based on waste characterization results, sediment may be classified as one of three potential waste types:

- Non-hazardous waste
- California hazardous waste (i.e., non-Resource Conservation and Recovery Act [RCRA] hazardous waste)
- RCRA hazardous waste.

Waste characterization sampling would be conducted as part of the remedial design. Based on the known nature and extent of existing sediment impacts, it is anticipated that sediment would be characterized as non-hazardous waste.

4.7.4.2 Transportation Plan

A Waste Management and Transportation Plan, as described in Attachment A, would be developed to provide specific approaches for managing materials in a way that reduces impacts on human health and the environment and minimizes impacts on local traffic, business, and residents near the MHF and along designated haul routes. The Waste Management and Transportation Plan would be prepared in accordance with DTSC Guidance for Developing Transportation Plans for Removal or Remedial Actions (DTSC 2001a). Transportation routes to the selected MHF and disposal facilities would be refined in the Waste Management and Transportation Plan.

Once dewatered and approved for disposal, sediment would be transported by trucks that are watertight and sift-proof and meet U.S. Department of Transportation (USDOT) standards (as applicable). If necessary to prevent material from adhering to or loss from truck beds, truck containers may be lined with 6-mil polyethylene, built-in liner or coating, configured with sealed tailgate, or similarly protected. Trucks will be covered with a soft pull-tarp cover or similar for off-site transport. The tarp would extend over the side of the truck or rail container and will be secured in accordance with USDOT and California Highway Patrol standards. The estimated number of truck trips from the MHF, days of transportation, average truck trips per day, and total average truck trips per day for sediment and debris generated and material imports as part of remediation are shown below in Table 4-4.

Table 4-4. Estimated Number of Truck Trips for Sediment and Debris and Materials Imports Needed for Each Phase of Work

	Sediment/Debris Trucks			Materials Imports[a]			
Area	Number of Trucks (round trip)[b]	Days of Transportation	Average Trips per Day	Number of Trucks (round trip)	Days of Transportation[c]	Average Trips per Day	Total Average Trips per Day (Sediment/ Debris and Materials Import)
A	530	76	7.0	1,347	123	11.0	18
B	286	46	6.2	591	92	6.4	13
C	706	108	6.5	1,253	167	7.6	14
D	440	75	5.9	724	125	5.9	12
E	2,243	381	5.9	1,867	428	4.4	12

Notes:
[a] Materials imports include backfilling, cap/armoring, offload/stabilization, mobilization, and water treatment materials.
[b] The estimate assumes that each truck would carry 22 tons of material per trip on average.
[c] Days of transportation are equivalent to the work phase days. It is assumed that transportation of materials imports would occur throughout the duration of the project phase.

The actual number of total trucks per day that enter and leave the MHF may be higher for Area A and Area B, which are planned for the same season. However, it is assumed that a maximum of approximately 21 trucks would enter or leave the MHF on any given day, ultimately determined by the availability of trucks and constraints at the site and landfills.

Material being transported would be wetted before being loaded to reduce the potential for dust generation during loading and transportation activities, in accordance with the Dust, Vapor, and Odor Control Plan. Before leaving the site, each truck would be inspected after filling to ensure that the affected soil or material is securely covered and that the tires and haul trucks are free of accumulated contaminated soil. Trucks would not stage on public streets.

4.7.4.3 Municipal and Permitted Non-hazardous and Hazardous Waste Landfills

Several landfills are located within 250 miles of the Project Area. While disposal facilities would be selected for the Project during the remedial design, the following landfills were identified as having the capacity and ability to accept dredged material, depending on its chemical characteristics:

- Non-hazardous landfills: Potrero Hills Landfill, Keller Canyon Landfill, Vasco Road Landfill, Altamont Landfill, Ox Mountain Landfill, and Hay Road Landfill
- California hazardous waste landfills: Kettleman Hills Landfill, Buttonwillow Landfill.

Figures 4-7 and 4-8 show potential transportation routes and distances from the Pier 96 and Berth 10 transload facilities, respectively. These potential transportation routes represent the most direct routes, which avoid passing nearby schools and limit transport through residential areas. The total number of vehicles and number of trips required per day would depend on the selected disposal facility and availability of equipment.

4.7.5 Other Disposal Alternatives

Potential alternative disposal and placement options include offshore ocean disposal and beneficial reuse at wetland restoration projects. For these alternatives, material would not need to be transferred to an upland handling facility for dewatering prior to disposal or placement. Segregating excavated materials within barges during dredging operations would be technically feasible but may not be cost-effective. Alternative disposal options are described below and those locations are shown in Figure 4-9.

4.7.5.1 Offshore Ocean Disposal

Offshore ocean disposal of sediment entails transportation of the dredged material via a barge to a permitted open ocean disposal site (SF-DODS) located 64 miles west of the Project Area. Under the Marine Protection, Research and Sanctuaries Act (MPRSA) and Section 404(b)(1) of the Clean Water Act, the U.S. Army Corps of Engineers (USACE) is the federal agency that manages permits authorizing the ocean disposal of dredged materials. There are specific testing requirements to determine whether the material is suitable for unconfined aquatic disposal at SF-DODS. USACE must obtain concurrence from EPA for any disposal at SF-DODS before it can approve a permit. The likelihood of obtaining an MPRSA permit for offshore ocean disposal is uncertain.

4.7.5.2 Beneficial Reuse

Beneficial reuse of sediment for wetlands habitat restoration entails loading and transporting dredged material via a barge to a permitted beneficial reuse site where it is then typically offloaded by slurrying and hydraulically pumping to areas within the site.

Beneficial reuse acceptance criteria for sediment are established in the Draft Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines (Regional Water Board 2000). The San Francisco Bay Dredged Material Management Office (DMMO) evaluates dredged material suitability for beneficial reuse. The DMMO is a joint program of the following agencies: USACE, EPA, Regional Water Board, San Francisco Bay Conservation and Development Commission (BCDC), and the State Lands Commission. The California Department of Fish and Wildlife (CDFW), the National Marine Fisheries Service (NMFS), and the U.S. Fish and Wildlife Service (USFWS) also provide input to the program. The beneficial reuse screening values are subject to modification with site-specific waste discharge requirements issued under permits to any new beneficial reuse site. While it would be technically feasible to segregate dredged material that would meet the beneficial reuse acceptance criteria (Regional Water Board 2000), it may not be cost-effective or work within the critical path schedule.

There are currently two beneficial reuse sites permitted to receive material: the Montezuma Wetlands Restoration Project and the Cullinan Ranch Restoration Project. In addition, there are four beneficial reuse sites that are expected to be permitted to receive dredged material in the near future (Figure 4-9).

4.8 Demobilization and Site Restoration

Following completion of work, site restoration would take place at the Project Area and the MHF. Temporary items such as security controls, structure protection, wildlife protections, and aids to navigation would be removed. Temporary piles installed for turbidity curtains would be removed using the techniques described in Section 4.5. Restoration activities in the Project Area would include replacement and repair of any necessary infrastructure removed or damaged during remediation. Replaced piles would be steel, wood, composite, or concrete and typically installed with vibratory methods. Pile installation using an impact hammer is not anticipated to be necessary for the majority of the piles that are being replaced; a limited number of piles may require an impact hammer, where they are considered load-bearing and as dictated by the Port engineers.

Relocated or removed docks would be returned when dredging and capping activities have been completed within the respective remediation areas. Alternatively, docks may be repurposed at the discretion of the Port and its tenants.

In Area E, the floating docks that would be relocated and stored during construction would be returned when dredging and capping activities have been completed within the respective remediation areas. If docks are damaged during relocation, docks would be repaired or replaced in kind as appropriate upon completing the dredging and capping activities. Alternatively, docks may be replaced or repurposed at the discretion of the Port and its tenants. The overall dock configuration and capacity (i.e., total floating cover area, post-remedy, within the marina would not be increased beyond the current acreage).

4.9 Permits, Approvals, and Notifications

It is anticipated that implementation of the Project could require actions and approvals from the regulatory agencies listed in Table 4-5.

Table 4-5. Permits and Approvals

Agency	Permit/Approval
Primary Permits and Approvals	
USACE	Clean Water Act Section 404 and Rivers and Harbors Act Section 10 permits for work in Waters of the U.S. associated with debris removal, dredging, and capping, placing of armor and riprap, and temporary fill associated with temporary pilings and other structures.
USFWS and NMFS	Consultation in compliance with the federal Endangered Species Act (Section 7 consultation), preparation of an essential fish habitat assessment under the Magnuson-Stevens Fishery Conservation and Management Act, and an Incidental Harassment Permit pursuant to the Marine Mammal Protection Act.
State Office of Historic Preservation	Section 106 consultation and approval under the National Historic Preservation Act in connection with the Section 404 permit from USACE.
Regional Water Board[8]	Approval of the FS/RAP, approval of the CEQA IS/MND, and issuance of a Clean Water Act Section 401 Water Quality Certification/Waste Discharge Requirements.
CDFW	Documentation of compliance with the state Endangered Species Act; an Incidental Take Permit would be required prior to any take of species listed as threatened or endangered under the California Endangered Species Act that are not also considered “fully protected” species by the State of California. A herring waiver could be requested concurrently to conduct activities outside of the work window.
BCDC	A permit (pursuant to the McAteer-Petris Act) for work in open water, marshes, and mudflats of the greater Bay and 100 feet inland from the shoreline around the Bay.
Other Permits and Approvals	
DMMO	Concurrence for dredged material that qualifies for beneficial reuse. For any disposal at SF-DODS, USACE would need concurrence from the EPA.

[8] A Notice of Intent to comply with the State Water Resources Control Board’s NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities, and preparation of a stormwater pollution prevention plan required for any construction project that disturbs more than 1 acre of land is not likely to be necessary, but a water pollution control plan should be developed.

Agency	Permit/Approval
Bay Area Air Quality Management District (BAAQMD)	Permits (as needed) for construction equipment (likely Authority to Construct and Permit to Operate).
NPDES (or pre-treatment permit)	Permit for discharge of decant water; if water goes to the sanitary sewer, a pre-treatment permit may be needed from SFPUC. Could be conducted under Regional Water Board Order R2-2015-0035, NPDES Permit CAG982001 for discharges from aggregate mining, marine sand washing, and sand offloading facilities.
Port of San Francisco Engineering Division Building Permit Group	Approval of building and/or encroachment permit applications for new construction or altered construction on Port property per the Port Building Code. A permit may be required for temporary construction of the MHF at Pier 96. The Port permit process includes review of project regulatory agency permits and authorizations and review and confirmation of documentation of compliance including but not limited to Traffic and Pedestrian Control Plans; Night Noise Permit; San Francisco Public Health, Article 22A (Maher); San Francisco Public Health, Article 22B (Air Quality/Dust); Erosion and Sediment Control Plan; Stormwater Pollution Prevention Plan; San Francisco Clean Construction Ordinance; San Francisco Environment Code: Construction & Demolition Debris Recovery Program.
Port, Real Estate Division	License Agreement between PG&E and the Port for 1) remediation and construction activities the Project Area 2) Lease Agreement for any Port property used for staging and the MHF; 3) Berthing Agreement for vessel berthing at Pier 96.

4.10 Control Measures and Monitoring Plans

Numerous control measures, also known as avoidance and minimization measures (AMMs), would be incorporated into the Project Contract Documents to address environmental and public health and safety concerns. Control measures are procedures known to further reduce the potential for impacts based on regulatory agency requirements, standards in the industry, and construction and operating experiences of the design engineer.

During construction, temporary controls would be implemented to mitigate the temporary impact of construction on the surrounding community and environment. Such controls would include, but not be limited to, turbidity curtains to control potential release of resuspended sediment outside the work area and containment booms and sorbent booms to contain and remove potential sheens. Controls could include odor-suppressing foam or other measures to mitigate odors associated with exposed sediments, misting with water to control potential release of airborne particulates, and other engineering and/or operational best management practices (BMPs). A bubble curtain sound attenuation system or isolation casing may be required during the use of an impact hammer on steel piles.

Several monitoring and management plans would be developed and an Environmental Compliance Management Plan would be implemented to provide compliance monitoring during construction, to guide the development and implementation of construction controls, and to document conformance with the details provided in the plans and specifications of the remedial design. The Environmental Compliance Management Plan would also contain the monitoring and reporting requirements associated with applicable federal, state, and local rules and regulations and would be prepared in general accordance with PG&E's "Environmental Compliance Management Plan for Construction Projects" guidance (PG&E 2013).

The monitoring program would include elements such as surveying, structural and geotechnical monitoring, and monitoring of potential environmental impacts to demonstrate compliance with CEQA mitigation and permit requirements (i.e., based on agency approvals, permit submittals, and/or specific permit conditions). The environmental component of the monitoring program would include but not be limited to AMMs and elements such as biological surveys and monitoring, where required; monitoring for sheens; water quality (e.g., turbidity) monitoring to measure resuspended sediment during dredging; air monitoring to measure airborne particulates; and qualitative evaluation of odor and noise. Biological and cultural resources technical reports have been completed, and these technical reports identify measures that would be included in the Project Contract Documents to address potential impacts.

Compliance and monitoring plans that would be developed and implemented for the Project include those for:

- Site/construction management and construction quality assurance
- Dredge and cap operations
- Dust and vapor control, including air monitoring
- Surface water quality
- Stormwater and erosion control
- Biological resources (e.g., marine mammals, invasive species)
- Hazardous materials and waste management
- Health and safety
- Sustainability
- Sediment processing (e.g., dewatering and water management)

- Noise, vibration, and sound attenuation
- Transportation management.

Attachment A provides a list of the control measures and AMMs as well as a description of the compliance, monitoring, and management plans that would be developed and implemented.

4.11 Post-Construction Activities

Once the recommended remedial alternative has been completed in each area, a Remedial Action Completion Report would be prepared to provide documentation of the implemented remedial actions.

A Risk Management and Monitoring Plan would be developed to prescribe the methods of monitoring the cap's integrity and remedy performance, identify conditions warranting cap maintenance/repair, identify areas where sediments with PAH concentrations exceeding the RAL remain in place, and articulate standards for preventing the post-construction engineered caps from being disturbed. Components of the Risk Management and Monitoring Plan may include requirements for the following:

- Monitoring the engineered sediment caps for physical integrity and design performance
- Maintaining, repairing, or adaptively managing the capping elements and/or other engineering controls
- Identifying activities, ranging from vessel traffic to infrastructure improvements, that may disturb constructed caps, or cap armor, and require cap restoration
- Identifying activities that may disturb sediment that provides existing cover for impacted sediment left in place
- Process for notifying, consulting with, and submitting applications to the Regional Water Board, the Port, and PG&E for projects that have the potential to impact or undermine the physical integrity or design performance of the constructed remedy.

ICs would be implemented in areas where sediment impacts are capped or sediment with PAH concentrations exceeding the RAL remain in place underneath existing sediment. Consistent with its regulatory requirements, the Regional Water Board may consider requesting a Land Use Covenant and Environmental Restriction to apply to some or all of response areas. If such a covenant cannot be recorded, the Risk Management and Monitoring Plan document may become the means by which the ICs are communicated to and implemented by the current and future owners, occupants, and lessees.

5 INITIAL STUDY CHECKLIST AND DISCUSSION

This section evaluates the potential environmental impacts associated with implementation of the Project. The format follows the Initial Study Checklist of the CEQA Guidelines, Appendix G, where each topic (e.g., land use, geology) is identified and a determination is made with regard to the impact's significance. An explanation is provided to support the finding of impact significance. Mitigation measures are provided, as applicable, for potentially significant impacts.

The wildfire impact analysis section is not applicable to the Project because it is not located in a state responsibility area or a very high fire hazard severity zone (VHFHSZ). The California Department of Forestry and Fire Protection (CAL FIRE) has a legal responsibility to provide fire protection on all state responsibility area lands, which are defined based on land ownership, population density, and land use. CAL FIRE does not have responsibility for densely populated areas, incorporated cities, agricultural lands, or lands administered by the federal government. All of the Project Area (including the MHFs) is located in a local responsibility area, and not a state responsibility area (CAL FIRE 2019). San Francisco County has no VHFHSZs, and Berth 10 is not located in or near a VHFHSZ (CAL FIRE 2020).

References:

1. CAL FIRE. 2019. California State Responsibility Areas for Fire Protection Map Image Layer (Last Modified June 20, 2019). Accessed at https://www.arcgis.com/home/item.html?id=5ac1dae3cb2544629a845d9a19e83991
2. CAL FIRE. 2020. California Fire Hazard Severity Zone Viewer (updated January 2020). Accessed at: https://gis.data.ca.gov/datasets/789d5286736248f69c4515c04f58f414

5.1 Aesthetics

Would the project:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings and historic buildings within a State scenic highway?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
c. Substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d. Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

Project Activities Likely to Create an Effect:

- In-water construction activities (e.g., debris removal, dredging, pile driving/removal, and capping/armor placement)
- Material handling
- Night work (use of light)

Existing Environmental Conditions:

The Project Area is located mostly within the subtidal and intertidal zone of the Bay between Piers 39 and 43½.The Project would also include activities at MHF sites in existing maritime use and industrial areas of San Francisco or Oakland.

The uplands adjacent to the Project Area are in a densely developed popular tourist area. In general, the shoreline and piers surrounding the Project Area are zoned for and have a high concentration of visitor-related commercial development, including more than 120 shops and other visitor attractions, such as the carousel, aquarium, and 300-boat public marina at Pier 39. Fresh seafood restaurants, chowder houses, and crab shacks also occupy a substantial portion of the upland adjacent to the Project Area (Port of San Francisco 2019). Pier 35 West (which is located at the eastern border but is not part of the Project Area) is used for cruise ship calls.

Bay scenic cruise boats and ferry terminals and their supporting infrastructure are located on two piers within the Project Area. There are also some grassy park areas along The Embarcadero as well as parking lots to support the commercial businesses. Figure 3-1 shows the Port's land uses, including tenants and their lease boundaries.

In addition to tourist-related businesses, the area supports a robust commercial fishing industry and other maritime businesses. As such, dredging and maintenance activities occur regularly.

Regulatory Framework:

San Francisco Land Use Plans

The **City and County of San Francisco's Northeastern Waterfront Area Plan** states that the visual character where piers are still intact (such as the Project Area) is dominated by the continued operation of shipping and related maritime uses. The plan encourages commercial and recreational maritime operations as well as the fishing industry in nearby areas, with possible expansion. The goal is to integrate the waterfront with the rest of the city to create an "authentic maritime character" (San Francisco Planning Department 2003a). The following objectives and policies are related to aesthetic resources:

- OBJECTIVE 10: To develop the full potential of the northeastern waterfront in accordance with the unusual opportunities presented by its relation to the Bay, to the operating port, fishing industry, and downtown; and to enhance its unique aesthetic qualities offered by water, topography, views of the City and Bay, and its historic maritime character.
  - POLICY 10.2: Preserve and create view corridors which can link the City and the Bay.
  - POLICY 10.5: Permit non-maritime development bayward of the sea wall only if the following qualifications are met:
    - Maximum feasible public access is provided to the water's edge.
    - Important Bay and waterfront views along the Embarcadero and level inland streets are preserved and improved. Minor encroachment into the view corridors from level inland streets may be permitted: (1) where the encroaching element has a distinct maritime character and adds variety to the views along the waterfront; (2) where minor structures (such as kiosks) are desirable to provide public amenities contributing to a continuity of interest and activity along the waterfront; (3) where essential maritime facilities cannot reasonably be located and designed to avoid view blockage; and (4) where the public enjoyment of the Bay will be enhanced by providing a place of public assembly and recreation, which allows unique vistas and overviews that include portions that are publicly accessible during daytime and evenings consistent with ensuring public safety.
- OBJECTIVE 11 (applicable to the Fisherman's Wharf Subarea [Municipal Pier through Pier 39]): To maintain and enhance the maritime character of the Fisherman's Wharf area, and enhance the area as a center for the commercial fishing industry.

The Urban Design Element includes the following policy related to aesthetic resources:

- City Pattern Objective 1, Policy 1.1 aims to "recognize and protect major views in the city, with particular attention to those of open space and water" (San Francisco Planning Department 2003b).

Port of San Francisco Waterfront Land Use Plans

The Fisherman's Wharf Subarea Plan applies to Piers 39 to 43½ and is consistent with the San Francisco General Plan in that it promotes a variety of fishing and other maritime uses in the Project Area (Port of San Francisco 2009). It includes the following development standards related to aesthetics:

- For the Pier 39 Open Space area (extending from Pier 41 to Pier 35, along The Embarcadero):
  - Continue to provide high quality, well-landscaped open space.
  - Improve views of the marina and the Bay, where feasible.

- For the Pier 43½ and the Triangle/Seawall Lot 300 and 301:
  - Consistent with the Waterfront Design and Access Element, design the plaza and any new retail buildings with "transparent" design to provide views through the building to the Bay.
  - Any expansion of building space at Pier 43½ should not block Bay views from the Mason Street view corridor.

In 2015, the Port began a comprehensive three-part public process to update the Waterfront Plan (Port of San Francisco 2019); the draft plan is undergoing public review and is expected to be complete by 2022. Components relevant to the Fisherman's Wharf area include investing in infrastructure improvements that maintain public safety and economic vitality; and adapting to sea level rise; and managing transportation to maintain viable industrial and loading access for fishing industry and commercial businesses, reduce single-occupant vehicle use, increase public transit service levels, enhance the pedestrian and bicycle experience, and support efficient parking operations.

The Southern Waterfront Subarea Plan applies to the area from Pier 70 to India Basin, including Pier 96. This subarea is currently used for the most of the Port's cargo and ship repair operations. The plan promotes expansion of cargo and heavy industrial maritime support uses (Port of San Francisco 2009). The draft Waterfront Plan update (Port of San Francisco 2019) seeks to improve and enhance Blue Greenway open space and public access areas that do not compromise maritime operations or sensitive environmental habitat areas, and provide education to promote public safety among maritime, small boating, and recreational water users. For the Pier 90–94 Backlands, the draft plan promotes pursuit of industrial warehouse facilities that are compatible with cargo terminal operations and provide maritime support uses, generate economic value and benefits to the Port and community, and productively improve land to support a stable industrial base in San Francisco.

Evaluation of Environmental Effects:

a. Have a substantial adverse effect on a scenic vista? (***Less Than Significant Impact***)

As summarized above, the Project Area's visual character is dominated by the commercial businesses of Piers 39 to 43½ (restaurants, commercial fishing operations, working docks, and other boating activities). The main scenic vistas are views of the Bay and the Pier 43 Ferry Arch (a historic resource discussed in detail in Section 5.5) from the plaza area adjoining Piers 39 to 43½. Construction activities for the Project would introduce additional equipment for sediment and debris removal, pile removal, and capping in the Project Area that could possibly block some views on a temporary basis. However, the public would continue to enjoy the existing views from this area during and after construction of the Project (i.e., no permanent visual elements or obstructions would be introduced to the Project Area).

Project-related equipment would be compatible with the surrounding maritime operations (which periodically require pier repairs, maintenance dredging and other activities using barges and heavy equipment) and the objectives of the City and County of San Francisco and Port plans for the area. Land-based construction within the Pier 39 to 43½ area is unlikely; any such construction would be very limited in duration and only in those areas inaccessible via water-based equipment.

Because the Project would not result in permanent changes to views of the Bay or the Pier 43 Ferry Arch, and the construction activities are similar to those ongoing in the Project Area, which include periodic pier repairs and maintenance dredging, the impact on a scenic vista would be less than significant.

b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway? **(*No Impact*)**

The Project Area and MHFs do not contain any trees or rock outcroppings and no trees in adjacent areas will be affected by the work. There are no currently designated State scenic highways in or around the Project Area. The Pier 43 Ferry Arch (a historic resource that is part of the viewshed) is located in the adjacent uplands and would not be affected by the Project, as explained in the Cultural and Tribal Cultural Resources section (Section 5.5). Therefore, the Project would not damage any scenic resources.

c. Substantially degrade the existing visual character or quality of the site and its surroundings? **(*Less Than Significant Impact*)**

As described in section (a) above, Project activities would be compatible with the visual character of the Project Area and adjacent areas, and any changes to views would be temporary. Therefore, the impact of the Project on the existing visual character or quality of the site and its surroundings would be less than significant.

d. Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area? **(*Less Than Significant Impact*)**

The Project would not result in any new, permanent sources of light or glare. Most remediation activities would occur during the day and would not use new sources of light. Some portions of sediment removal and cap installation may require minimal nighttime work that would require lighting. Additional details on nighttime work will be developed as part of the remedial design. As described in Attachment A, a control measure would be implemented to reduce the impact of light on residences, nighttime commercial properties, and oncoming traffic lanes during nighttime work. Any necessary lighting would be temporary and focused on activities within the Project Area. To avoid illuminating the surrounding areas, the lighting would not be directed toward adjacent businesses.

With implementation of the control measure described above, substantial light and glare would be minimized and the Project impact on day and nighttime views in the area would be less than significant.

References:

1. Port of San Francisco. 2009. Waterfront Land Use Plan, Revised version, October 2009. Accessed at: https://sfport.com/waterfront-land-use-plan-chapters

2. Port of San Francisco. 2019. Waterfront Plan, Draft for Public Comment and Review, December 2019. Accessed at: https://sfport.com/sites/default/files/Waterfront%20Plan_1.pdf.

3. San Francisco Planning Department. 2003a. San Francisco General Plan, Northeastern Waterfront Area Plan. Available at: https://generalplan.sfplanning.org/NE_Waterfront.htm.

4. San Francisco Planning Department. 2003b. San Francisco General Plan, Urban Design Element. Available at: https://generalplan.sfplanning.org/I5_Urban_Design.htm#URB_CPN_1.

5.2 Agricultural and Forestry Resources

Would the project:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	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 Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b. Conflict with existing zoning or agriculture use, or a Williamson Act contract?	☐	☐	☐	☒
c. Conflict with existing zoning for, or cause rezoning of, forestland (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Codes section 51104(g))?	☐	☐	☐	☒
d. Result in the loss of forestland or conversion of forestland to non-forest use?	☐	☐	☐	☒
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland, to non-agricultural use or conversion of forestland to non-forest use?	☐	☐	☐	☒

Project Activities Likely to Create an Effect:

None.

Existing Environmental Conditions:

The Project Area is located in the waters of the Bay adjacent to Piers 39 to 43½, in a densely developed tourist area zoned for a high concentration of visitor-related commercial development. The MHF sites are surrounded by industrial uses. According to the San Francisco and Oakland zoning maps, no agricultural or forest lands exist within these cities (San Francisco Planning Department 2020; City of Oakland 2015).

Regulatory Framework:

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 CAL FIRE regarding the state's inventory of forestland, including the Forest and Range Assessment Project and the Forest Legacy Assessment project, and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board (CARB).

Evaluation of Environmental Effects:

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? **(*No Impact*)**

The Project Area and MHF sites do not contain any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as defined by the Farmland Mapping and Monitoring Program (California Department of Conservation 2019a). Therefore, the Project would have no impact on Farmland.

b. Conflict with existing zoning for agricultural use, or a Williamson Act contract? (***No Impact***)

There is no agricultural use zoning in the Project Area or surrounding areas, so the Project would not conflict with existing zoning for agriculture use. San Francisco County is a "non-participating" county for Williamson Act contracts (California Department of Conservation 2019b). The portion of Alameda County where Berth 10 is located is not eligible for Williamson Act contracts because it does not contain agricultural land. There is no agricultural land in the Project Area. Therefore, the Project would not conflict with agricultural zoning or Williamson Act contracts.

c. Conflict with existing zoning for, or cause rezoning of, forestland (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))? (***No Impact***)

There is no forestland use zoning in the Project Area or surrounding areas. Therefore, the Project would not conflict with existing zoning or cause rezoning of forestland or timberland.

d. Result in the loss of forestland or conversion of forestland to non-forest use? (***No Impact***)

The Project Area and surrounding areas do not contain forestland. Therefore, the Project would not result in the loss of forestland or conversion of forestland to non-forest use.

e. Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of farmland, to non-agricultural use or conversion of forestland to non-forest use? **(*No Impact*)**

The Project Area and surrounding areas do not contain farmland or forestland, and therefore, the Project would have no other impacts on farmland or forestland. The Project Area is surrounded by lands that are already developed, approved for development, or designated as parkland area; therefore, the Project would not increase development pressure on agricultural lands by extending infrastructure into agricultural areas.

References:

1. California Department of Conservation. 2019a. Farmland Mapping and Monitoring Program – Alameda County. Accessed at: https://www.conservation.ca.gov/dlrp/fmmp/Pages/Alameda.aspx.
2. California Department of Conservation. 2019b. The Williamson Act Status Report 2016-17. Accessed at: https://www.conservation.ca.gov/dlrp/wa/Documents/stats_reports/2018%20WA%20Status%20Report.pdf.
3. City of Oakland. 2015. City of Oakland General Plan Designations Map. Accessed at: https://cao-94612.s3.amazonaws.com/documents/General-Plan-Designations-20150519.pdf.
4. San Francisco Planning. 2020. Zoning Use Districts Map. Accessed at: https://sfplanninggis.s3.amazonaws.com/hub/BIGmap.pdf.
5. San Francisco Planning Department. 2020. Zoning Use Districts Map. Accessed at: https://sfplanninggis.s3.amazonaws.com/hub/BIGmap.pdf.

5.3 Air Quality

Would the project:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b. Result in cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c. Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d. Result in other emissions (such as those leading to odors adversely affecting a substantial number of people)?	☐	☐	☒	☐

Project Activities Likely to Create an Effect:

- In-water construction activities (e.g., debris removal, dredging, pile driving/removal, capping/armor placement, and slope stabilization)
- Barge transport of materials and transport of workers

- Trucking/transportation of dredged material and debris to landfills and other disposal facilities
- Import of materials to Project Area
- Material handling

Existing Environmental Conditions:

The Project is located in San Francisco County, part of the nine-county San Francisco Bay Area Air Basin (SF Air Basin). Federal, state, and regional agencies regulate air quality in the SF Air Basin. At the federal level, EPA is responsible for overseeing implementation of the federal Clean Air Act (CAA). CARB is the state agency that regulates mobile sources throughout the state and oversees implementation of the state air quality laws and regulations, including the California CAA. The local air quality regulatory agency responsible for the SF Air Basin is the BAAQMD.

Local Climate and Air Quality

The air quality of the SF Air Basin is a product of sources of air pollution within the basin, transport of pollutants to and from surrounding areas, local and regional meteorological conditions, and the surrounding topography. Air quality is described by the concentration of various pollutants in the atmosphere. Units of concentration are generally expressed in parts per million or micrograms per cubic meter. The significance of a pollutant concentration is determined by comparing the concentration to an appropriate ambient air quality standard. The standards represent the allowable pollutant concentrations and are intended to protect public health and welfare. The standards are designed to include a reasonable margin of safety to protect the more sensitive individuals in the population.

As defined by BAAQMD's current air quality planning document, the 2017 Clean Air Plan/Regional Climate Protection Strategy, San Francisco is located in the peninsula climatological subregion. The peninsula region extends from northwest of San Jose to the Golden Gate. The Santa Cruz Mountains run up the center of the peninsula, with elevations exceeding 2,000 feet at the southern end and decreasing to 500 feet in South San Francisco. Coastal towns experience a high incidence of cool, foggy weather in the summer. Cities in the southeastern peninsula experience warmer temperatures and fewer foggy days because the marine layer is blocked by the ridgeline to the west. San Francisco lies at the northern end of the peninsula. Because most of San Francisco's topography is below 200 feet, marine air flows easily across most of the city, making its climate cool and windy.

At the northern end of the peninsula in San Francisco, where the Project will be located, pollutant emissions are high, especially from motor vehicle congestion. Localized pollutants, such as carbon monoxide (CO), can build up in "urban canyons." Winds are generally fast enough to carry the pollutants away before they can accumulate (BAAQMD 2017a).

Criteria Air Pollutants

The federal and California CAAs have established ambient air quality standards for common pollutants. The ambient air quality standards are intended to protect human health and welfare. At the federal level, national ambient air quality standards have been established for criteria pollutants. These criteria pollutants include CO, ozone (O_3), nitrogen dioxide (NO_2), respirable particulate matter with a diameter less than 10 microns (PM_{10}), fine particulate matter with a diameter less than 2.5 microns ($PM_{2.5}$), sulfur dioxide, and lead.

The State of California has adopted ambient air quality standards that are, in general, more stringent than the national ambient air quality standards, and include pollutants not regulated at the federal level (sulfates, hydrogen sulfide, and vinyl chloride).

National and state ambient air quality standards are shown in Table 5-3.1. Both the national and state ambient air quality standards have been adopted by BAAQMD.

Table 5-3.1. State and National Air Quality Standards and Summary of Measured Air Quality Exceedances in the Project Area (2017–2019)

Pollutant/Averaging Period	Primary Standard State	Primary Standard National	Year	Maximum Concentration [a]	Days Exceeding State/National Standard
Ozone 1-hour	0.09 ppm	none	2017	0.087	6/0
			2018	0.065	2/0
			2019	0.091	6/0
Ozone 8-hour	0.70 ppm	0.70 ppm	2017	0.054	6/6
			2018	0.049	2/3
			2019	0.073	9/0
Carbon Monoxide 1-hour	20 ppm	35 ppm	2017	2.4	0/0
			2018	1.9	0/0
			2019	1.2	0/0
Carbon Monoxide 8-hour	90 ppm	9 ppm	2017	1.4	0/0
			2018	1.6	0/0
			2019	1	0/0
Nitrogen Dioxide 1-hour	0.18 ppm	0.100 ppm	2017	0.073	0/1
			2018	0.069	0/0
			2019	0.061	0/0
Nitrogen Dioxide Annual	0.030 ppm	0.053 ppm	2017	0.011	0/0
			2018	0.011	0/0
			2019	0.01	0/0
Sulfur Dioxide 1-hour	none	0.075 ppm	2017	Not monitored at this site	0/0
			2018		0/0
			2019		0/0
Sulfur Dioxide 24-hour	0.04 ppm	none	2017	Not monitored at this site	0/0
			2018		0/0
			2019		0/0
Respirable Particulate Matter (PM_{10}) 24-hour	50 μg/m^3	150 μg/m^3	2017	77	6/0
			2018	43	6/1
			2019	42	5/0
Respirable Particulate Matter (PM_{10}) Annual	20 μg/m^3	none	2017	22	0/0
			2018	20.1	0/0
			2019	14.7	0/0
Fine Particulate Matter ($PM_{2.5}$) [a] 24-hour	None	35 μg/m^3	2017	49.9	0/18
			2018	177.4	0/18
			2019	25.4	0/1

Table 5-3.1. State and National Air Quality Standards and Summary of Measured Air Quality Exceedances in the Project Area (2017–2019)

Pollutant/Averaging Period	Primary Standard State	Primary Standard National	Year	Maximum Concentration [a]	Days Exceeding State/National Standard
Fine Particulate Matter ($PM_{2.5}$) [a] Annual	12 µg/m^3	12.0 µg/m^3	2017	9.7	0/0
			2018	11.7	0/0
			2019	7.7	0/0

Source: BAAQMD (2019)

Notes
µg/m^3 = micrograms per cubic meter
ppm = parts per million

[a] All pollutant concentrations were measured at the San Francisco monitoring station located at 10 Arkansas Street, Suite N, San Francisco, CA 94107 (4 miles south of Pier 39 and 3 miles north of Pier 96).

Ambient concentrations of criteria pollutants are monitored in the SF Air Basin by BAAQMD. The San Francisco station is the closest to the Project Area and the only station in San Francisco County. Table 5-3.1 includes a summary of the monitored maximum concentrations and the number of occurrences of exceedances of the state and national ambient air quality standards for the 3-year period from 2017 through 2019.

Table 5-3.1 shows that over the last 3 years the following exceedances were reported: the 1-hour state O_3 standard was exceeded 14 times and the 8-hour state and national O_3 standards were exceeded 17 and 9 times, respectively; the 1-hour national NO_2 standard was exceeded once; the 24-hour state and national PM_{10} standards were exceeded 17 times and 1 time, respectively; and the 24-hour national $PM_{2.5}$ standard was exceeded 37 times.

Toxic Air Contaminants

In addition to “criteria” air pollutants, there is another group of substances found in ambient air; this group is referred to as toxic air contaminants (TACs). These contaminants tend to be localized and are found in relatively low concentrations in ambient air. However, they can result in adverse chronic health effects including cancer. Sources of TACs include industrial processes such as petroleum refining and manufacturing, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. One of the TACs of greatest concern in California is diesel particulate matter (DPM), which is classified as a carcinogen (i.e., causes cancer). TACs are regulated at the local, state, and federal levels.

Regulatory Framework

Federal Air Quality Regulations

The federal CAA requires CARB, based on air quality monitoring data, to designate portions of the state where the national ambient air quality standards are not met as “nonattainment areas.” Because of the differences between the national and state ambient air quality standards, the designation of nonattainment areas is different under the federal and state legislation. Areas that meet the air quality standards are considered to be in attainment of the standards. Areas where there are no monitoring data available or insufficient data to classify the area are considered unclassified, which for regulatory purposes is treated as an attainment area.

The Bay Area as a whole does not meet national ambient air quality standards for O_3 and $PM_{2.5}$. EPA has classified the region as marginal nonattainment for 8-hour O_3. In October 2009, EPA designated the Bay Area as a nonattainment area for the 24-hour $PM_{2.5}$ standard. The Bay Area is considered as attainment or unclassifiable with respect to the national air quality standards for all other pollutants. EPA requires states that have areas that are not in compliance with the national standards to prepare and submit air quality plans showing how the standards would be met. If the states cannot show how the standards would be met, then they must show progress toward meeting the standards. These plans are referred to as the State Implementation Plans. On January 9, 2013, EPA issued a final rule to determine that the Bay Area has attained the national 24-hour $PM_{2.5}$ air quality standard. This action suspends federal State Implementation Plan planning requirements for the Bay Area. BAAQMD has permit authority over stationary sources, acts as the primary reviewing agency for environmental documents, and develops regulations that must be consistent with or more stringent than federal and state air quality laws and regulations.

California Air Quality Regulations

The California CAA outlines a program for areas in the state to attain the California ambient air quality standards by the earliest practical date. The California CAA set more stringent air quality standards for most of the pollutants covered under national standards, and additionally regulates other pollutants. If an area does not meet the California ambient air quality standards, CARB designates the area as a nonattainment area. With respect to the state air quality standards, the Bay Area is a nonattainment area for O_3 and particulate matter (PM_{10} and $PM_{2.5}$), and either attainment or unclassified for other pollutants. The California CAA requires local air pollution control districts to prepare air quality attainment plans for pollutants, except for particulate matter, that are not in attainment with the state standards. These plans must provide for district-wide emission reductions of 5 percent per year averaged over consecutive 3-year periods or if not, provide for adoption of "all feasible measures on an expeditious schedule."

Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles

This plan represents the state's comprehensive blueprint for substantially reducing diesel particulate emissions throughout the state (CARB 2000). The plan contains the following components:

- New regulatory standards for all new on-road, off-road, stationary diesel-fueled, and marine engines to reduce DPM emissions by about 90 percent overall from year 2000 levels
- New retrofit requirements for existing on-road, off-road, and stationary diesel-fueled engines and vehicles, where determined to be technically feasible and cost-effective
- Voluntary application of diesel particulate filters for commercial marine vessels
- New Phase 2 diesel fuel regulations to reduce the sulfur content levels of diesel fuel to no more than 15 ppm to provide the quality of diesel fuel needed by the advanced DPM emission controls.

These plan elements have been implemented through the adoption of new regulations.

In-Use Off-Road Diesel Vehicle and Large Spark Ignition Fleet Regulations

On July 26, 2007, CARB adopted In-Use Off-Road Diesel Vehicle and Large Spark Ignition Fleet Regulations to reduce DPM and oxides of nitrogen (NOx) emissions from off-road heavy-duty diesel vehicles in California. The Off-Road Regulation (1) limits idling of off-road equipment to 5 minutes; (2) restricts the adding of older vehicles into fleets starting on January 1, 2014; and (3) requires fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing Verified Diesel Emission Control Strategies (i.e., exhaust retrofits).

Truck and Bus Regulation

On December 12, 2008, CARB approved the Truck and Bus Regulation to significantly reduce particulate matter and NOx emissions from existing diesel vehicles operating in California with a gross vehicle weight rating greater than 14,000 pounds. The regulation was amended by CARB on April 25, 2014. The regulation requires upgrade of older diesel engines to newer models in accordance with a schedule based on the age of the original engine. The regulation provides a variety of flexibility options tailored to fleets operating low use vehicles, fleets operating in selected vocations like agriculture and construction, and small fleets of three or fewer trucks. By 2023, most diesel-powered trucks and buses will be required to have 2010 model year or newer engines.

Commercial Harbor Craft Regulation

On November 15, 2007, CARB approved a regulation to reduce emissions from diesel engines on commercial harbor craft vessels. The regulation became effective January 1, 2009, and included requirements for both new and in-use diesel engines used on commercial harbor craft operating in Regulated California Waters including internal, estuarine, and coastal waters. The regulation required the following:

- Commercial harbor craft owner/operators are required to keep records for each vessel, install a non-resettable hour meter on each engine, submit an initial report to CARB by February 28, 2009, and keep a copy of yearly records on the vessel or in a central dockside location to be made available upon request by CARB staff.
- The engines on all new commercial harbor craft vessels are required to meet the EPA marine engine emission standards in effect at the time the vessel is acquired.
- Existing Tier 1 and earlier auxiliary and propulsion engines on in-use ferries, excursion vessels, tugboats, towboats, and multipurpose harbor craft must meet EPA Tier 2 or Tier 3 standards in effect at the time of regulation compliance. The schedule for compliance is based on the engine model year and hours of operation and is designed to replace the oldest, highest use engines first.

Regional Air Quality Regulations and Planning

Air quality in the Project region is regulated by BAAQMD. BAAQMD regulates stationary sources (with respect to federal, state, and local regulations), monitors regional air pollutant levels (including measurement of toxic air contaminants), develops air quality control strategies, and conducts public awareness programs.

Clean Air Plan

The most recent air quality air plan is the 2017 Clean Air Plan that was adopted by BAAQMD in April 2017 (BAAQMD 2017b). The 2017 Clean Air Plan provides a regional strategy to protect public health and protect the climate. To protect public health, the plan describes how BAAQMD will continue making progress toward attaining all state and federal air quality standards and eliminating health risk disparities from exposure to air pollution among Bay Area communities. The 2017 Clean Air Plan includes a wide range of control measures designed to decrease emissions of the air pollutants that are most harmful, such as particulate matter, O_3, and toxic air contaminants; and to decrease emissions of carbon dioxide (CO_2) by reducing fossil fuel combustion. The 2017 Clean Air Plan represents the Bay Area’s most recent assessment of the region’s strategy to attain the state and national ozone and $PM_{2.5}$ standards.

The 2017 Clean Air Plan’s control measures for construction equipment, on-road trucks, and marine vessels are to reduce emissions by:

1) Providing cash incentives to retrofit diesel engines with DPM filters or upgrade to Tier 4 engines
2) Working with CARB and the California Energy Commission to develop more fuel-efficient off-road engines and drive trains

3) Working with local communities, contractors, and developers to encourage the use of renewable alternative fuels in applicable equipment

CEQA Air Quality Guidelines

BAAQMD has also developed CEQA Air Quality Guidelines that establish significance thresholds for evaluating new projects and plans and provide guidance for evaluating air quality impacts of projects and plans (BAAQMD 2017a). The Air Quality Guidelines provide procedures and significance thresholds for evaluating potential construction-related impacts during the environmental review process consistent with CEQA requirements.

Evaluation of Environmental Effects:

a. Conflict with or obstruct implementation of the applicable air quality plan? **(*Less Than Significant Impact*)**

The Project Area is in an area currently designated as nonattainment for the California 1-hour and 8-hour O_3 standards, nonattainment for the state 24-hour and annual PM_{10} standards, and nonattainment for the state annual $PM_{2.5}$ standard. It is also designated as nonattainment for the national 8-hour O_3 standard. To meet planning requirements related to these standards, BAAQMD has developed a regional air quality plan, the Bay Area 2017 Clean Air Plan. A significant impact would occur if a project conflicted with the plan by not being consistent with the population growth and vehicle miles traveled assumptions of the plan.

Construction activities associated with the Project would be short term and temporary, and the Project would use on-road vehicles, off-road construction equipment, and marine harbor craft vessels and equipment that would comply with current BAAQMD and state/local plans and regulations. For these reasons, implementation of the Project would not conflict with or obstruct implementation of any applicable air quality plan. A detailed analysis of the potential emissions associated with the Project is described below in subsection (b). Based on the discussion above and the analysis provided below, this impact would be less than significant.

b. Result in cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard? **(*Less Than Significant Impact*)**

The Project would involve construction activities associated with remediation (e.g., removing sediments and debris, placing cap and armoring, trucking) that would result in temporary increases in air pollutant emissions. These emissions would be generated primarily from construction equipment exhaust, marine harbor craft vessels, and other remediation-related construction activities, and construction worker and other construction-related vehicle trips to and from the Project construction areas. Implementation of the Project would result in emissions of ozone precursors (reactive organic gases [ROG] and NOx), and particulate matter from (1) fugitive dust emissions, including road dust, from on-road vehicles, (2) off-road construction equipment, and (3) harbor craft exhaust[1] as a result of the burning of diesel or gasoline fuels.

BAAQMD has identified CEQA thresholds of significance for exhaust emissions from construction-related activities. Table 5-3.2 lists the significance thresholds for daily and annual criteria air pollutant emissions from construction (BAAQMD 2017a).

[1] On-road vehicles refer to vehicles that are permitted and registered for use on public roads and highways. Off-road construction equipment refers primarily to heavy-duty diesel-fueled construction equipment.

Table 5-3.2. Criteria Air Pollutant Thresholds of Significance

Criteria Air Pollutants and Precursors	Construction-Related Average Daily Emissions (pounds/day)
ROG	54
NOx	54
PM_{10}	82 (exhaust)
$PM_{2.5}$	54 (exhaust)

Source: BAAQMD (2017a)

Construction would potentially occur over a 5- to 10-year period in which remedial response areas would be constructed in phases. In general, each remedial response area would be constructed in a single construction season in a single year, except for Area E, which could take up to 2 years. However, remedial work could be expedited, with some remedial response areas combined within a single construction season or year; areas other than Area E could be spread over more than 1 year. The maximum activities that could be done in a single year can be represented by combining Areas B and C into a single year or construction season. This maximum scenario would represent the maximum intensity of work, trucking and hauling trips, equipment usage, and work days. To be conservative, air quality emission estimates were evaluated for (1) Areas B and C (the maximum scenario), and (2) Area E. This approach provides an assessment of upper-bound emissions.

Construction emissions of ozone precursors ROG and NOx, and PM_{10} and $PM_{2.5}$, were estimated based on information obtained from the design engineers (Haley & Aldrich) and using the California Emissions Estimate Model (CalEEMod, Version 2016.3.2), an air quality modeling program that estimates air pollutant emissions in tons per year. Project-specific inputs to CalEEMod include Project land use types; size in acres and square feet; start and end dates of construction phases; heavy-duty equipment types and operating hours; volumes of structures to be demolished; and haul, material, and worker trips. Emissions from marine harbor craft vessels and equipment were estimated based on the type of marine vessel and estimation of the operating time of the propulsion and auxiliary engines using CARB's methodology (CARB 2012) and emission factors (CARB 2011). Note that the assumptions used in this analysis are based on planning-level information; actual equipment types and numbers, worker trips, and other aspects of construction would be determined by the contractor. The assumptions and resulting emission estimates provided herein are likely conservative (i.e., overestimates).

The detailed calculations are included in Attachment B and the results are summarized in Table 5-3.3 below, which summarizes the combined average daily emissions of all remediation-related emissions for landside and marine construction emissions for Areas B and C and Area E.

Table 5-3.3. Daily Project Construction Emissions

	Estimated Average Daily Criteria Pollutant Emissions (pounds/day)			
Remedial Response Area	ROG	NOx	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Landside Emissions				
Area B and C	0.64	7.86	0.22	0.20
Area E	1.90	18.23	0.54	0.50

Table 5-3.3. Daily Project Construction Emissions

Remedial Response Area	Estimated Average Daily Criteria Pollutant Emissions (pounds/day)			
	ROG	NOx	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
Marine Emissions				
Area B and C	2.55	20.66	1.11	1.11
Area E	2.02	16.87	0.90	0.90
Total				
Area B and C	3.19	28.52	1.33	1.31
Area E	3.92	35.10	1.44	1.40
Threshold of Significance	54	54	82	54
Exceedance of Threshold?	No	No	No	No

Air pollution is largely a cumulative impact. No single project is sufficient in size to result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant (BAAQMD 2017a).

The thresholds of significance developed by BAAQMD represent the levels at which a project's individual emissions of criteria air pollutants (or precursors) for which the SF Air Basin is in nonattainment would result in a cumulatively considerable contribution. The estimated emissions of ozone precursors ROG and NOx and particulate matter PM_{10} and $PM_{2.5}$ (Table 5-3.3) are below the threshold of significance for construction-related emissions (Table 5-3.1). Therefore, the emissions would not be considered cumulatively considerable. Therefore, this impact would be less than significant.

c. Expose sensitive receptors to substantial pollutant concentrations? **(*Less Than Significant Impact*)**

Sensitive receptors are people who are potentially at greater risk than the general population to the effects of air pollutants (e.g., children, asthmatics, the elderly, and the chronically ill). Sensitive receptors may be present at locations that include residences, schools, playgrounds, childcare centers, retirement homes, hospitals, and medical clinics. The following discussion reviews the potential for sensitive receptors in the vicinity of the Project Area and MHFs.

Sensitive Receptors near Piers 39 to 43½

There are no sensitive land uses (e.g., hospitals, schools, daycare centers, nursing homes) within ¼ mile of the Project Area. There are no residences within the Project Area, but there are hotels adjacent to the Project Area and apartment buildings within three blocks. The shoreline and piers surrounding the Project Area are zoned for and have a high concentration of tourist-oriented commercial development, including more than 120 shops, and other visitor attractions. Bay scenic cruise boats and ferry terminals and their supporting infrastructure are located on two piers within the Project Area. The berth areas are also periodically dredged to maintain navigable depths.

Sensitive Receptors near Pier 96

The closest residential properties to Pier 96 are about 0.5 mile southwest of Pier 96 off Keith Street and Middle Point Road. The Bayview neighborhood spreads out to the southwest beyond this point, with many residential properties within 1 mile of Pier 96. Rise University Preparatory (an independent Christian middle and high school) is the closest school, located about 0.7 mile southwest of Pier 96 off Evans Avenue. Additional schools within a 1-mile radius include the main location of Rise University Preparatory on Galvez Avenue, KIPP Bayview Elementary, KIPP San Francisco College Preparatory, and the Evans Center (part of City College of San Francisco). The area also contains one daycare center (Ideal Daycare on La Salle Avenue) and a few assisted living centers (CCHNC Providence Senior Housing, Northridge Cooperative, and Providence Senior Housing). However, none of these uses is located along the haul route to landfills, between Pier 96, US 101 and Interstate 280.

Sensitive Receptors near Berth 10

The nearest residential properties to Berth 10 are the Station House Oakland Condos on Frontage Road between 16th and 14th Streets, about 0.7 mile southeast of Berth 10. A large residential area spreads out to the southeast past Station House, bounded by Interstate 880 to the south/southeast. There are no daycare centers, schools, or nursing homes within a 1-mile radius, including along the haul route from Berth 10 to Interstate 880.

Potential Impacts on Sensitive Receptors

Sensitive receptors located near Piers 39 to 43½, Pier 96, and Berth 10 would be exposed to short-term emissions of TACs while Project-related remediation activities take place.

The primary TAC of concern for the Project is DPM from diesel-fueled construction equipment. CARB designated DPM as a TAC in 1998 based on its potential to cause cancer and other health problems. The prevailing winds at Piers 39 to 43½, Pier 96, and Berth 10 are generally from the west–southwest, west, and west–northwest. Because the winds in San Francisco are generally strong enough to carry pollutants away before they can accumulate (BAAQMD 2017a), DPM from construction or remediation activities is unlikely to affect nearby residences or schools. In addition, the contractors will be required to follow any applicable guidelines set by the City of San Francisco and BAAQMD for reducing vehicle idling, an activity that can increase emissions of DPM.

Dredging activities at Piers 39 to 43½ could release chemicals from contaminated sediments, such as PAHs, into the air. PAHs are found predominantly found adsorbed onto particulates and are considered semivolatile compounds. PAHs with lower vapor pressures (e.g., benzo[*a*]pyrene) tend to be adsorbed to particles (i.e., dust), whereas PAHs with higher vapor pressures (e.g., naphthalene) can be associated with the vapor phase. Naphthalene is the primary PAH that can volatilize, but it is classified as a semi-volatile organic compound due to its vapor pressure of 0.087 millimeters of mercury (mm Hg) at 25 °C, which is just below the 0.1 mm Hg cut-off often used to define volatile organic compounds (DTSC 2015). In general, PAHs are not highly volatile and are readily controlled through dust management at remedial construction sites.

Windblown dust from sediment drying agents (e.g., Portland cement, kiln dust) can be a hazard to both human health and the environment. Dust would be controlled as the dredging and capping activities are planned to be performed “in the wet” (i.e., where all activities either take place below the water line or involve saturated materials); thus, dust generation is expected to be *de minimis*. It is possible that some dry materials (e.g., sand) that are planned to be placed over the sediment surface and through the water column could generate dust before they are saturated, although wetting of these materials would reduce the potential for dust generation and these materials would be “clean” fill. In addition, diesel-powered trucks delivering raw materials or transporting dredge sediments and debris for offsite disposal are also a source of DPM emissions.

Material handling and management activities at Pier 96 or Berth 10 are more likely to generate dust during dewatering of the dredged material and handling of debris. The materials would still generally have a high moisture content, as “dried” sediments would be loaded into trucks as soon as they are "stackable" to ensure that free water does not leak onto the road surface in trucks (determined through a "paint-filter" test).

The following plans, controls, and AMMs, which are further described in Attachment A, would be implemented minimize emissions and to ensure that air quality remains within acceptable levels:

- Environmental Compliance Management Plan (e.g., checklists specifying monitoring/inspection requirements needed to comply with control measures and plans)
- Health and Safety Plan (e.g., identifying potential airborne hazards anticipated for workers)
- Dust, Vapor, and Odor Control Plan (e.g., track-out controls, stop work limits on windy days)
- Ambient Perimeter Air Monitoring Plan (e.g., field monitoring for dust and vapor for community protection)
- Dust, Vapor, and Odor Control Measures (e.g., idling times, wet suppression methods, haul truck coverings, street sweeping)
- Sustainability Measures Implementation Plan (e.g., strategies and recommendations to optimize sustainable practices, including alternative fuels).

These plans and measures are consistent with the BAAQMD basic construction recommendations for all proposed projects and meet requirements of the Port of San Francisco and City and County of San Francisco. With implementation of these plans, controls, and AMMs, the potential Project-related impacts on sensitive receptors from pollutants would be less than significant.

d. Result in other emissions (such as those leading to odors adversely affecting a substantial number of people? **(*Less Than Significant Impact*)**

Implementation of the Project could result in odor emissions from contaminated sediments as they are dredged, handled, stockpiled, and dried during remediation activities. Odors can be associated with chemical constituents but are more commonly associated with anaerobic conditions (when deeper sediments are removed) and decomposing organic material that can emit hydrogen sulfide gas upon dredging and give rise to a nuisance odor.

Odors would be controlled as the dredging activities are planned to be performed "in the wet" (i.e., where all activities either take place below the water line or involve saturated materials), thus significantly reducing odors. Material handling and management activities at Pier 96 or Berth 10 could also generate odors during dewatering of the dredged material and handling of debris. The materials would still generally have a high moisture content, as "dried" sediments would be loaded into trucks as soon as they are "stackable" to ensure that free water does not leak onto the road surface in trucks (determined through a "paint-filter" test).

The following plans, controls, and AMMs, which are further described in Attachment A, would be implemented to suppress and minimize odors that may be temporarily apparent during dredging, sediment dewatering, and conditioning:

- Dust, Vapor, and Odor Control Plan (e.g., track-out controls, odor suppression)
- Ambient Perimeter Air Monitoring Plan (e.g., field monitoring for dust and vapor for community protection)
- Dust, Vapor, and Odor Control Measures (e.g., idling times, maintenance of construction equipment, wet suppression methods, haul truck covering).

With implementation of these plans, controls, and AMMs, the potential Project-related impacts due to other emissions, such as odors, would be less than significant.

References:

1. BAAQMD. 2017a. California Environmental Quality Act Air Quality Guidelines. May 2017. Available at: http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed January 2019. Bay Area Air Quality Management District.
2. BAAQMD. 2017b. Spare the Air Cool the Climate: A Blueprint for Clean Air and Climate Protection in the Bay Area. Bay Area Air Quality Management District. April.
3. BAAQMD. 2019. Annual Bay Area Air Quality Summaries. Available at: http://www.baaqmd.gov/about-air-quality/air-quality-summaries. Bay Area Air Quality Management District.
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5. CARB. 2012. Draft Emission Estimation Methodology for Commercial Harbor Craft operating in California. Available at: https://ww3.arb.ca.gov/msei/chc-appendix-b-emission-estimates-ver02-27-2012.pdf. California Air Resources Board.
6. CARB. 2011. Commercial Harbor Craft Emissions Models (Access Database). California Air Resources Board.
7. DTSC. 2015. Advisory – Active Soil Gas Investigations. Available at: https://dtsc.ca.gov/wp-content/uploads/sites/31/2018/01/VI_ActiveSoilGasAdvisory_FINAL.pdf. California Department of Toxic Substances Control.

5.4 Biological Resources

Would the project:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	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 Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Project Activities Likely to Create an Effect:

- In-water construction activities (e.g., debris removal, dredging, pile driving/removal, capping/armor placement, and slope stabilization)
- Night work (use of light)

Existing Environmental Conditions**:**

A biological resource analysis (BRA) for the Project was prepared by Johnson Marigot Consulting, LLC (JMC) (2021) and is included in Attachment C. The reader is referred to the BRA for a detailed discussion of the biological setting and impact analysis.

The Project Area is characterized as urban land and offshore areas (Figure 7 of the BRA). The majority of the Project Area is located within an active waterfront area and includes fishing vessels, recreational vessels and docks, and ferry terminals. The shoreline is well developed with commercial areas including parking lots, hotels, shops, restaurants, and recreational grass/park areas. The proposed MHF would be located at Pier 96, which is along the Bay waterfront, approximately 6 miles to the south of Piers 39 to 43½, or as an alternative, Berth 10 which is located in the northwestern corner of the Port of Oakland near the foot of the San Francisco-Oakland Bay Bridge (Figure 2-1).

The offshore portion of the Project Area is primarily subtidal habitat characterized by open water and a soft sediment seafloor. The Project Area also contains hard substrates like submerged concrete breakwater, bulkheads, vessel structures, pilings, riprap, and pipelines. Maintenance dredging is performed in portions of the Project Area every 3 to 5 years to ensure safe navigation for vessels. Depressions resulting from propeller wash ("scour areas") occur in four locations: within the southwest corner of the Pier 39 West Basin where the Blue & Gold Fleet excursion vessels berth, at Pier 41½ where the San Francisco Bay Ferries berth, at Pier 43½ where the Red and White Fleet vessels berth, and on the eastern edge of the Pier 39 East Basin (near the entrance to that marina).

Multibeam bathymetric surveys show debris (e.g., wood, concrete, broken piles, metallic items, and unidentifiable objects) on the seafloor across the Project Area with the highest density located within the footprint of the former Pier 43 (Haley & Aldrich 2020). In addition, unidentifiable objects are located farther offshore and closer to the Fisherman's Pier, near shore within the Pier 39 West Basin, and within the footprint of the former Pier 37 within the Pier 39 East Basin. Per Port maintenance dredge permits, the Pier 96 berths are authorized to be maintained at a depth of –40 feet MLLW to allow vessel berthing, loading, and unloading. The Port of Oakland's Berth 10 is authorized to be maintained at a depth from –42 to –50 feet MLLW according to the Oakland Harbor Navigation Improvement Project (USACE 2020).

Urban Land

All wharf and pile-supported structures within the Project Area (approximately 3.1 acres) are classified as urban land by the California Wildlife Habitat Relationships System (Figure 7 of the BRA). The original shoreline has been modified by more than a century of fill and development. Most of the Project Area is paved hardscape, with ornamental plantings within strips and lawns.

Offshore Areas

The Project Area is entirely within jurisdictional waters of the U.S./State (WOTUS).The southern Project Area boundary is defined by a concrete seawall, which generally coincides with the high tide line and mean high water. Subtidal and intertidal zones occur within the offshore areas.

The open waters of the central Bay are inhabited by more than 30 species of pelagic fish (IEP 2009) and seven species of marine mammals. Prevalent species in the central Bay that are likely to occur in the Project Area include northern anchovy (*Engraulis mordax*), jacksmelt (*Atherinopsis californiensis*), bay goby (*Lepidogobius lepidus*), English sole (*Parophrys vetulus*), speckled sanddab (*Citharichthys stigmaeus*), plainfin midshipmen (*Porichthys notatus*), Pacific staghorn sculpin (*Leptocottus armatus*), shiner perch (*Cymatogaster aggregata*), cheekspot goby (*Ilypnus gilberti*), white croaker (*Genyonemus lineatus*), bonyhead sculpin (*Artedius notospilotus*), Pacific sandab (*Citharichthys sordidus*), and bay pipefish (*Syngnathus leptorhynchus*). California sea lions (*Zalophus californianus*) are now a mainstay on K Dock in Pier 39 West Basin. Hard bottom substrates in the central Bay are typically covered with a mixture of sessile epibenthic organisms dominated by algae, mussels, chitons, limpets, barnacles, oysters, sea stars, hydroids, bryozoans, tunicates, encrusting sponges, encrusting diatoms, and anemones (Hieb 1999).

Benthic Habitat Conditions

Sediment profile and plan view imaging surveys were conducted at 100 stations within the Project Area in January 2018 to characterize the physical and biological conditions of the surficial sediments in the area (Haley & Aldrich 2018). In March of 2019, a multibeam, mobile LiDAR, and sub-bottom profiling were also used to map prominent geophysical characteristics, including areas of vessel scour (e.g. scour within ferry berthing areas, sloughing/scour at entrance to Pier 39 East Basin). In addition, photoreconnaissance and probing supplemented the studies to characterize Bay floor conditions. Data collected as a part of these efforts were used to create a benthic habitat map, which can be used to assess the quality of the benthos (Figure 8 of the BRA). The analysis identified three categories of substrates within the Project Area:

- **Hardscape considered unsuitable habitat for infaunal organisms (1.6 acres):** These areas consisted of cobbles, boulders, and riprap and lacked sediment accumulation. The largest contiguous area of hardscape appears just beyond Pier 43½ near the shoreline. This debris appears to be remnant material from the former pier. Although rock and hardscape provide habitat for epifaunal species, such as sponges, and may provide beneficial habitat complexity for fish and mobile invertebrates, such as crabs, currently these areas consist of non-native debris, shoreline stabilization materials such as riprap, or cobble exposed by scour. Based on sediment profile and plan view imaging analysis, these areas were considered unsuitable habitat for infaunal organisms.

- **Softscape with physical disturbance (2.7 acres):** These areas primarily occur where the sediment–water interface is routinely disturbed by vessel traffic or wave action. Nearly all of which are located within areas with high vessel traffic and are within the bottom of and along the edges of scour areas. These areas maintain a sediment profile with a thin or recently disturbed apparent redox potential discontinuity (aRPD). The aRPD value indicates the depth at which the sediment transitions from being oxidized to reduced, and is useful in assessing the quality of a habitat for epifauna and infauna from both physical and biological points of view. The aRPD depth in profile images has been shown to be directly correlated to the quality of the benthic habitat. Advanced infaunal successional stages were observed; however, most activity occurred at depths below the disturbed layer. As such, these areas appear to provide marginal foraging habitat, as benthic development is impeded by frequent disturbance.

- **Softscape with minimal physical disturbance (showing benthic colonization) (5.5 acres):** These areas primarily occur within areas protected by breakwaters and where smaller vessels operate at slower speeds such as in the marina east of Pier 39. These areas maintain a sediment profile with moderately deep aRPDs. Advanced infaunal successional stages were observed throughout the profiles. These areas also support surface tubicolous infauna that provide for increased secondary production and, thus, provide higher quality foraging habitat for various fish species.

Information used in the preparation of the section below is from a biological reconnaissance survey conducted by JMC biologists on June 11 and August 22, 2019 (Attachment C). Information about special status species that could occur within the Project Area was obtained from the following sources:

- California Natural Diversity Database (CNDDB) RareFind 5 (CDFW 2019; CDFW 2020)
- California Native Plant Society (CNPS) Inventory of Rare, Threatened, and Endangered Plants of California (CNPS 2020)
- National Marine Fisheries Service (NMFS) Listed Species, Critical Habitat, Essential Fish Habitat (EFH), and Marine Mammal Protection Act (MMPA) species lists (NOAA 2016)
- USFWS Information for Planning and Consultation (IPaC) resource list report (USFWS 2019)
- Existing literature as cited in the BRA.

The National Oceanic and Atmospheric Administration (NOAA) Fisheries Listed Species, Critical Habitat, EFH, and MMPA species data were queried to identify all federally endangered, threatened, candidate, and proposed fish species in the San Francisco North, Point Bonita, San Quentin, Oakland West, San Francisco South quadrangles.

In addition, the CNDDB was queried to identify all special-status species with known occurrences within a 3-mile radius surrounding the Project Area. A query of the CNPS Inventory of Rare, Threatened, and Endangered Plants of California was conducted for state and federally listed and candidate species, as well as CNPS-ranked species known to occur on the same quadrangle as the Project Area (San Francisco North), to determine additional special-status plants with potential to occur within the Project Area.

Resources Considered within the Analysis

Special-status species include species considered to be rare by federal and/or state resource agencies (USFWS, NMFS, CDFW) and/or the scientific community (CNPS) and are accordingly legally protected via federal, state, and/or local laws. For the purposes of this review, the potential for project-related impacts was considered for species and habitats protected by the following regulations and designations:

- Species listed or proposed for listing as threatened or endangered or candidates for future listing under federal Endangered Species Act (FESA) (50 Code of Federal Regulations [CFR] 17.12 listed plants, 17.11 listed animals).
- Species listed or proposed for listing by the state as threatened or endangered under the California Endangered Species Act (CESA) (14 California Code of Regulations [CCR] 670.5).
- Species described by CDFW as species of special concern.
- Species designated as “special animals” by the state.
- Species designated as “fully protected” by the state.
- Species designated as California Rate Plants by CNPS.
- Any migratory bird or any part, nest, or egg of any such bird protected by the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code.
- Raptors (birds of prey), which are specifically protected by California Fish and Game Code Section 3503.5, thus prohibiting the take, possession, or killing of raptors and owls, their nests, and their eggs.
- Marine mammals covered under the MMPA.
- Marine mammals, which are specifically protected by California Fish and Game Code Section 4500, thus prohibiting the take of marine mammals.
- Pacific herring, which are specifically protected by California Fish and Game Code Sections 8550-8559, limiting any type of in-water work that may affect schools of herring or spawning herring during the spawning season from December 1 to March 15.
- Dungeness crab, which are specifically protected by California Fish and Game Code Section 8275, which states that no Dungeness crab females or juveniles less than 6¼ inches in breadth may be taken, possessed, bought, or sold.
- Habitat designated as EFH under the Magnuson-Stevens Fishery Conservation and Management Act (MSA).
- Habitat designated as Critical Habitat as part of species listing pursuant to FESA.

No special-status plants are expected to occur within the Project Area. A total of 55 special-status wildlife species and/or subspecies are known to occur in the vicinity of the Project Area or have ranges that overlap with the Project Area. Of these 55 species and/or subspecies, 31 species are not expected to occur within the Project Area itself due to lack of suitable habitat and/or lack of range overlap. The remaining regionally known special-status species and/or subspecies as well as MBTA-protected birds have the potential to occur within the Project Area and are discussed below and outlined in Table 5.4-1.

Table 5-4.1. Special-Status Wildlife Species with Potential to Occur in Project Area

Common Name	Seasonality	Status Code[1]
MARINE MAMMALS		
Pacific harbor seal	Present year-round	MMPA
Steller sea lion - eastern Distinct Population Segment (DPS)	Mid-May to mid-July	MMPA
California sea lion	Present year-round	MMPA
Northern elephant seal	mid-February–June 30	MMPA
Northern fur seal	Extralimital species	MMPA
Harbor porpoise	Present year-round	MMPA
Common bottlenose dolphin	Present year-round	MMPA
Gray whale	Late winter/early spring	FE, MMPA
Humpback whale	April–November	FE, MMPA
BIRDS		
Migratory birds (nesting)	Nest February 1–August 31	MBTA
INVERTEBRATES		
Benthic invertebrates	Present year-round	MSA
Dungeness crab	May 1–June 30	CDFW Managed
FISH		
Green sturgeon – southern DPS	Present in low numbers year-round	FT
Steelhead trout – Central California Coast DPS	December–May	FT
Steelhead trout – California Central Valley DPS	December–May	FT
Chinook salmon – Central Valley Spring Run Evolutionarily Significant Unit (ESU)	December–May	FT, ST
Chinook salmon – Sacramento River Winter Run ESU	December - May	FE, SE
Chinook salmon – Central Valley Fall-run and late-fall-run ESU	July - April	SSC
MSA managed fish	Variable depending on species	MSA Managed
Longfin smelt	Present in low numbers year-round	FC, ST
Pacific herring	Present year-round	MSA/CDFW Managed

Notes:

[1] Legal status codes are as follows:

CDFW Managed = managed by California Department of Fish and Wildlife

FC = federal candidate species

FE = federally listed as endangered

FT = federally listed as threatened

MMPA = Marine Mammal Protection Act

MSA Managed = Magnuson-Stevens Fishery Conservation and Management Act

SE = state-listed as endangered

ST = state-listed as threatened

SSC = state species of concern

[2] MSA managed fish in the vicinity of the Project Area include English Sole, Jacksmelt, Northern Anchovy, Olympia Oyster, Pacific (chub) Mackerel, Pacific Jack Mackerel, and Pacific Sardine

Special-Status Plants

The eelgrass species that occurs in the Bay is common eelgrass (*Zostera marina*). According to the California Wetland Monitoring Workgroup California EcoAtlas, no eelgrass occurs within the Project Area or surrounding vicinity (CWMW 2020).

Marine Mammals

Three marine mammal species are known to occur within the Project Area: California sea lion (MMPA Protected Species), Pacific harbor seal (*Phoca vitulina*) (MMPA Protected Species), and Steller sea lion (eastern DPS) (*Eumetopias jubatus*) (MMPA Protected, Depleted, and Strategic). A resident population of California sea lions occurs within the Project Area boundaries, primarily centered around K Dock (Pier 39 West Basin) with numbers reaching as high as 1,701 individuals observed at once (November 2009).While Pacific harbor seals are less common, they are routinely observed within the Project Area, Pacific harbor seals and eastern DPS Steller sea lions are rarely documented visitors to K Dock. Marine mammals occasionally also use docks within the Area E (East Basin) for haul-outs.

No other marine mammals have been recorded within the Project Area boundaries; however, due to the Project Area's location along the margins of the central Bay, other protected marine mammal species that have a low likelihood of occurring within the Project Area include common bottlenose dolphin (*Tursiops truncates*), gray whale (*Eschrichtius robustus*), harbor porpoise (*Phocoena phocoena*), humpback whale (*Megaptera novaeangliae*), northern elephant seal (*Mirounga angustirostris*), and northern fur seal (*Callorhinus ursinus*).

Fish

Five state and/or federally listed fish species are known to occur within the Bay and have potential to occur within the Project Area: Chinook salmon (*Oncorhynchus tshawytscha*) (Central Valley Spring Run, Sacramento River Winter Run, and Central Valley Fall-run and late-fall-run Evolutionarily Significant Units), green sturgeon (*Acipenser medirostris*) (Southern DPS), longfin smelt (*Spirinchus thaleichthys*), Pacific herring (*Clupea pallasii*), and steelhead trout (*Oncorhynchus mykiss*) (California Central Valley and Central California Coast DPS).

Birds

Special-status birds known to forage within the central Bay are not expected to occur within the Project Area due to the heavily trafficked marina setting and resulting marginal quality of foraging habitat. Although special-status birds like the American peregrine falcon (*Falco peregrinus anatum*) have not been observed in the Project Area, several common species have been observed onsite. For instance, the western gull (*Larus occidentalis*) was observed atop the Pier 45 structure exhibiting nesting behavior during the August 2019 site visit. Vessels used to operate dredging and pile-driving equipment would also provide suitable nesting substrate for scrape- and cavity-nesting birds (species such as black oystercatchers (*Haematopus bachmani*), pigeon guillemot (*Cepphus columba*), and western gull are known to nest on vessels within the Bay). Similarly, the onsite and site-adjacent trees and shrubs provide suitable nesting habitat for passerines.

Invertebrates

The most common invertebrates found within the central Bay include blackspotted shrimp (*Crangon nigromaculata*), bay shrimp (*Crangon franciscorum*), Dungeness crab (*Metacarcinus magister*), and slender rock crab (*Cancer gracilis*). Invertebrates provide an important food source for fishes, marine mammals, and birds. Two species of note that have the potential to occur within the Project Area are Dungeness crab (which is of commercial importance) and native oysters. Dungeness crabs, which live in the benthic environment, are susceptible to direct entrainment by dredging equipment (USACE et al.1998). Crab abundance tends to be higher in the Central Bay and North Bay (especially San Pablo Bay) in shallow berthing areas and channels between May 1 and June 30 (USACE 2001). Benthic invertebrates colonize soft sediments, providing a food source for fishes and other bottom dwelling organisms (e.g., crab). The Olympia oyster (*Ostrea lurida*) is native to the Bay and inhabit brackish water conditions typical of the central Bay. Olympia oysters contribute to biodiversity as they provide physical structure, an important base for aquatic ecosystem development. They are known to improve local water quality as they stabilize sediment. Native oysters have been reported inhabiting the intertidal and subtidal rocks composing the riprap shoreline. A formal survey or evaluation for the presence of native oysters has not been completed. The riprap shoreline within the intertidal zone of the Project Area could provide suitable habitat for native oysters.

Habitats and Natural Communities of Special Concern

Critical Habitat

All Bay waters within the Project Area are critical habitat for southern DPS green sturgeon, steelhead trout (Central Valley DPS and Central California Coast DPS), and Sacramento River Winter Run Evolutionarily Significant Unit Chinook salmon (Figure 9 of the BRA). Critical habitat within estuary habitat is defined by the perimeter of the water body or the elevation of extreme high water, whichever is greater.

While the Project Area is located within designated critical habitat for federally listed fish species, the elements (physical or biological features) that are essential to the conservation of these species (abundant prey items, high water and sediment quality, aquatic vegetation, and nearshore marine areas free of obstruction) are poorly developed, as the offshore areas are partially degraded and habitat is highly limited due to the presence of shoreline stabilization, non-native invasive species, historical discharge and accumulation of contaminants and debris, periodic dredging, vessel traffic (which causes frequent increases in turbidity), and the resulting lack of submerged aquatic vegetation and stable high quality habitat components.

Essential Fish Habitat

The entire Bay is classified as EFH for species managed under the Pacific Coast Salmon Fisheries Management Plan (FMP), the Coastal Pelagic Species FMP, and the Pacific Coast Groundfish FMP (Figure 10 of the BRA). Listed salmonids that are managed under the MSA and that may occur within EFH in the Project Area are limited to Chinook salmon. Although coho salmon are also managed under the Pacific Coast Salmon FMP, they are presumed extirpated from the Bay and are not expected to occur within the Project Area. Pelagic species that are not federally listed but managed under the MSA include Pacific sardine (*Sardinops sagax*), Pacific (chub) mackerel (*Scomber japonicus*), Pacific jack mackerel (*Trachurus symmetricus*), northern anchovy (*Engraulis mordax*), and jacksmelt (*Atherinopsis californiensis*). Groundfish refers to more than 90 types of groundfish, flatfish, rockfish, sharks, and skates (as an ecosystem component) known to occur on the West Coast. Species that may be within EFH in the Project Area and are managed under the Pacific Coast Groundfish FMP, but not federally listed, include English sole (*Parophrys vetulus*).

Habitat Areas of Particular Concern (HAPCs) are a subset of EFH. The Pacific Coast Groundfish FMP designates HAPCs for groundfish along the West Coast and within the extent of the Bay. The groundfish HAPC is based on both specific habitat types and discrete areas including estuaries, canopy kelp, seagrass, and rocky reefs. The Pacific Coast Salmon FMP describe components of the salmon HAPCs to include complex channel and floodplains, thermal refugia, spawning habitat, estuaries, and marine and estuarine submerged aquatic vegetation. Although the HAPC designation does not confer additional restrictions, designation does prioritize and focus conservation efforts. HAPCs are high priority areas for conservation and management because they are important to ecosystem function, sensitive to human activities, stressed by development, or rare (NOAA 2020).

Wildlife Corridors and Nursery Sites

A wildlife corridor is an area of habitat adjoining two or more larger areas of similar wildlife habitat, often connecting wildlife populations separated by natural or created activities, disturbances, or structures. Wildlife corridors functionally reduce fragmentation, allowing access to larger stretches of suitable habitats. They are used by individuals and populations for dispersal and migration, allowing for genetic exchange and population growth.

The central Bay connects the greater San Francisco Bay-Delta and inland rivers to the Pacific Ocean and is an important part of the migration route for anadromous fish and marine mammals. The greater San Francisco Bay-Delta is an important wintering and stop-over site along the Pacific Flyway, providing refuge for 300,000 migrating birds (NOAA 2007). The Bay is also considered a productive nursery for fish, birds, mammals, and invertebrates. The Project Area's location along the margins of the central Bay places it within these essential wildlife corridors; however, the Project Area itself does not represent a wildlife nursery or an important element of those corridors due to its marginal habitat and its location along the margins of the Bay, within a heavily trafficked marina.

Regulatory Framework:

Below is a discussion of the federal, state, and local statues, regulations, and resource management programs that pertain to protection of biological resources in the Project Area. Several permits and approvals are necessary to comply with these regulations. Those are outlined in Section 4.9 and Attachment A.

Federal Regulations:

- Section 10 of the Rivers and Harbors Act (RHA) and Section 404 of the Clean Water Act (CWA) compliance is required through USACE issuance of a Department of the Army permit as the project would require placement of fill in waters of the U.S.
- FESA compliance is required through section 7 consultation between USACE and NMFS to ensure the project would not jeopardize the existence of a federally listed species (e.g., green sturgeon).
- MSA compliance will require consultation with NMFS as the project has the potential to affect EFH and related federal fisheries.
- MMPA compliance will be required through NMFS issuance of an Incidental Harassment Authorization (IHA) or Letter of Authorization (LOA) as the project has the potential to disturbance marine mammals protected under the act.

- MBTA compliance will be required as the project has the potential to disturb migratory birds or any part, nest, or egg of such bird protected under the act.

State Regulations:

- A Section 401 of the CWA, Water Quality Certification (federal regulations administered by the State) and/or Waste Discharge Requirements compliant with Porter Cologne Water Quality Act will be required from the Regional Water Board where a project may result in a discharge into waters of the U.S. (i.e., the Bay), including but not limited to the discharge of dredged or fill material. Section 401 requires certification from the State Water Resources Control Board verifying that the dredge or fill project is in compliance with all state water quality standards.
- CESA compliance will be required as the project may result in take of a state listed species (i.e., longfin smelt).
- Section 307 of the Coastal Zone Management Act (CZMA) (federal regulations administered by the State) and McAteer-Petris Act compliance will be required through permit authorization from the BCDC, which has permitting authority for dredging, disposal and filling activities within the Bay.

The project must also comply with the local regional plans listed below as well as the San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan; Regional Water Board 2019), which is the master policy document pertaining to the legal, technical, and programmatic structure for regulating water quality in the Bay. The Basin Plan offers guidelines for the protection of surface waters (i.e., freshwater lakes, rivers, and streams), estuaries, enclosed bays, and ocean waters, and describes the water quality control measures that are necessary to protect the beneficial uses of the Bay.

Port of San Francisco's Waterfront Land Use Plan

The Project Area is located within the Fisherman's Wharf Subarea of the Port's Waterfront Land Use Plan (Port of San Francisco 2009). The priority for the Fisherman's Wharf Subarea is to reinvigorate the fishing industry while supporting visitor-serving activities, the combination of which has made the Wharf one of the top visitor attractions in the United States, generating substantial revenues to the Port and the City and County of San Francisco. The primary challenge in the Fisherman's Wharf Subarea is considered to be financing requirements for the improvements needed to ensure the continued presence and improved health of the fishing industry.

Applicable development standards for the Project Area include the following:

- Operate and manage activities to ensure compliance with all applicable environmental and water quality laws and regulations. Coordinate compliance efforts to improve water quality with the Fisherman's Wharf Environmental Quality Advisory Committee.
- Remove the deteriorated portion of Pier 43 that extends into the Bay, north of the Ferry Arch.

San Francisco Bay Subtidal Habitat Goals Report

The San Francisco Bay Subtidal Habitat Goals Report is a collaboration among BCDC, the California Ocean Protection Council, the California State Coastal Conservancy, NOAA, the NMFS, and the San Francisco Estuary Partnership, developed to provide a Bay-wide approach to setting science-based goals for maintaining a healthy, productive, and resilient ecosystem within the submerged areas of the Bay (California State Coastal Conservancy et al. 2010). The Subtidal Habitat Goals Report has set resource management goals and criteria for soft and hard subtidal substrate, artificial structures, macroalgae beds, and shellfish beds. The Subtidal Habitat Goals Report includes habitat conservation goals that promote allowing no net loss or disturbance of soft bottom and rock habitats (subtidal and intertidal zones), enhancing habitat function of artificial structures, minimizing placement of artificial structures detrimental to subtidal habitat function, protecting native shellfish habitat and existing eelgrass habitat, and protecting macroalgae beds (*Fucus* and *Gracilaria* spp.). The San Francisco Bay Subtidal Habitat Goals Report provides guidance to regulatory agencies; however, it is not a permitting mechanism.

Long-Term Management Strategy for Placement of Dredged Material in San Francisco Bay Region

The Long-Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region (LTMS) was created in 1990 as a collaborative partnership involving regulatory agencies, resource agencies, and stakeholders working together to address potential impacts from dredging and dredged material disposal on water quality, wildlife, and beneficial uses of the Bay. CDFW, the USFWS, and NOAA's NMFS have collaborated on the LTMS to develop measures to avoid and minimize the potential impacts of dredging and disposal projects. One of the primary tools used to avoid and minimize the potential adverse effects of dredging and in-Bay disposal was7 environmental work windows. Environmental work windows are established periods within the calendar year that avoid or minimize overlap with the presence of a target species or a sensitive life stage of a target species. For certain species listed under the FESA, and some non-listed species of special concern, environmental work windows were incorporated into the LTMS Program. During environmental work window periods, dredging and disposal activities are restricted in specific areas to protect listed species and species of special concern. On July 9, 2015, NMFS issued a Biological Opinion to USACE enumerating many work windows and avoidance measures applicable to the Project.

San Francisco Tree Ordinance

The San Francisco Public Works Code (Sections 808, 810) states that it shall be unlawful for any person to engage in any construction work on private or public property without first taking steps to protect "Protected Trees" from damage, including damage caused by soil compaction or contamination, excavation, or placement of concrete or other pavement or foundation material. If excavation, construction, or street work is planned within the dripline of a "Significant Tree," a "Landmark Tree," or a tree on any street or other publicly owned property, said tree(s) must be adequately protected.

Evaluation of Environmental Effects:

a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? **(*Less Than Significant with Mitigation Incorporated*)**

Project activities including dredging, slope stabilization, cap and armoring, test borings associated with the geotechnical investigation, and pile installation and removal can be expected to result in temporary increases in in-water and underwater noise and/or airborne sound levels, temporary increases in turbidity, and the potential introduction or redistribution of non-native species

These activities have the potential to affect special-status species including California sea lions, Pacific harbor seals, Steller sea lions, Chinook salmon, steelhead trout, green sturgeon, longfin smelt, and Pacific herring if not mitigated. These Project activities could directly or indirectly affect special-status fish and marine mammal species, their foraging habitats and behaviors, and their sources of forage.

Disturbances to Special-Status Fish

Green sturgeon, longfin smelt, and Pacific herring are the only protected fish species that have the potential to be present within the Bay year-round. While green sturgeon and longfin smelt may occur within the deeper waters of the central Bay year-round, they spawn primarily in freshwater in the lower reaches of the Sacramento River and San Joaquin River. It is unlikely that these species would routinely enter the Project Area to forage, however, it is possible that these species could be found within the Project Area boundaries as individuals' migrate through the Golden Gate. Pacific herring have historically spawned along the San Francisco waterfront annually in the winter months, and CDFW prohibits most in-water work during the December 1 to March 15 spawning season without a waiver and/or biological monitoring. Chinook salmon and steelhead trout are present in the Bay only during migratory periods, either when adults migrate from the ocean to upstream freshwater breeding habitat or when juveniles out-migrate from natal streams to the ocean. Due to the timing of migrations through the Bay, these species are absent from the Bay from June through November.

Project activities may affect protected fish due to elevated underwater noise, increased turbidity, and fish entrainment. Increased underwater noise can occur during pile installation (required for turbidity curtain installation, dock relocation, and soil stabilization), removal, or proofing (i.e., short-duration impact pile driving). Impact pile driving introduces impulsive sound into the water column that can result in pressure changes that can potentially cause injury to fish. However, studies assessing underwater sound levels associated with vibratory hammer methods for pile installation projects in the Bay have demonstrated that use of vibratory hammers to install piles (Buehler et al. 2015) does not present a risk of physical injury or mortality to fish. Regardless, as vibratory pile driving may impact herring spawning activities, it is not permitted during herring spawning season (December 1 to March 15). Work activities that could result in elevated underwater noise that could adversely affect fish would be generally be limited to occur during the June 1 to November 30 work window to ensure unnecessary take or injury of migratory salmonids does not occur.

Dredging may expose contaminated sediments; however, the sediment cap placement is proposed to occur shortly after dredging, minimizing exposure and release of contaminated sediments (Haley & Aldrich 2020b). Fish entrainment potential is also minimized by conducting dredging and capping activities during the work windows. Use of diver-assisted micro (hydraulic) dredging will be limited to the maximum extent feasible. If hydraulic dredging is required, a CDFW-issued Incidental Take Permit (ITP) will be obtained establishing measures to reduce potential for fish entrainment in suction dredging equipment.

Increased turbidity as a result of disturbance of bottom sediments during project construction and dredging and capping activities, affects fish species in several ways. Elevated turbidity in the water column during dredging, cap/armor installation, as well as pile driving/removal can reduce dissolved oxygen levels and affect gill function, reducing respiratory functions. Turbidity can disrupt normal feeding behavior, consequently decreasing growth rates. Dredging operations can also result in entrainment of fish and minor underwater sound alterations; underwater sound produced by dredging is not expected to reach levels higher than the existing ambient levels resulting from the steady marina traffic. Elevated turbidity is expected to be present mainly within the turbidity curtains in the active work areas. To minimize fish entrainment, turbidity curtains will only be deployed during active capping and dredging and as necessary to control turbidity (i.e., curtains will be removed between activities and when turbidity has returned to background levels).

Finally, placement of capping material can reduce food supplies for fish, short term, although current contaminated sediments provide a reduced-quality food source.

In-water Project-related construction activities (e.g., pile installation/removal, dredging, capping, debris removal) have the potential to affect Pacific herring during spawning events. Adult herring spawn in the Bay from December through March, with peak spawning occurring in January. Dredging and pile driving activities result in increased suspended sediment, which can lead to sublethal and lethal effects on herring embryos after a spawning event.

Special-status fish could be affected because of Project implementation. The following plans, controls, and AMMs, which are further described in Attachment A, would be implemented to reduce disturbances to special-status fish:

- Environmental Compliance Management Plan (e.g., monitoring and/or inspecting and reporting requirements for compliance measures)
- Sound Attenuation and Monitoring Plan (provides guidelines for assessing and mitigating airborne and in-water noise produced)
- Stormwater Pollution Prevention Plan and/or Erosion and Sediment Control Plan (describes methods for addressing potential site- related stormwater runoff)
- Dredging and Capping Operations Plan (provides approach and sequencing to reduce water quality and other impacts)
- Surface Water Quality Monitoring Plan (describes procedures and practices to protect water quality)
- Marine Invasive Species Control Plan (provides methods to contain the spread of non-native species)
- Worker Environmental Awareness Training (e.g., mandatory environmental education program)
- Biological Control Measures and AMMs, including Special Status Species AMMs (e.g., pile installation and removal restrictions, work windows, measures required within the ITP, if applicable).

In addition, a USACE Department of the Army (Section 404 of the CWA and Section 10 of the RHA) permit and a Regional Water Board 401 Certification (Section 401 of CWA) would be required for the Project. As part of that permitting process, Section 7 FESA consultations with resource agencies are required. Through that process, issuance of a project-level Biological Opinion or Letter of Concurrence (NMFS) would be required. In addition, issuance of an ITP (CDFW) would likely be required.

Avoidance and minimization measures would reduce effects to these species and be required within authorizations provided by NMFS and CDFW. These measures typically include limitations on in-water construction activities (e.g., dredging, pile removal/installation, and capping) that may adversely affect these species to a work window of June 1 to November 30 (when Chinook salmon and steelhead trout are generally absent from the Bay). Restrictions on in-water construction during the approved environmental work window will be adhered to as established by NMFS at the conclusion of the federal Endangered Species Act Section 7 consultation and conditions in the CDFW ITP to be issued for the project.

In-water construction activities restricted to this window would include pile installation with an impact hammer, dredging, and cap installation. Some in-water construction activities (e.g., removing, relocating, or replacing docks and other infrastructure) can be conducted year-round outside the work windows if approved (during the permitting process) and likely would occur between March 16 and June 1 (outside the herring spawning season, unless a waiver is received, for non-pile installation activities; see discussions below) as part of site preparation and mobilization.

Dredging and capping activities would likely be restricted to the work window (June 1 to November 30) to protect migratory salmonid species. In rare instances, at the approval of the regulatory agencies, additional work such as capping and demobilization may be extended past November 30. If an extension is granted, a herring spawning monitor (with stop work authority) maybe be required after December 1.

Combined with the plans, controls, and AMMs and requirements imposed through the permitting process, implementation of the following mitigation measures would reduce potential Project-related impacts on special-status fish to less than significant.

Mitigation Measure BIO-1A

In-water work activities may not be conducted during the December 1 to March 15 Pacific herring spawning season. As the spawning season approaches (month of November), a trained biologist shall monitor the waters within a specified distance of in-water Project activities for spawning event indicators (e.g., presence of milt in the water, active surface predation of herring by birds or marine mammals) and/or conduct herring egg surveys. If required, work shall be stopped if a spawning event is detected in the immediate vicinity of in-water work and shall not resume until spawning has ended and herring embryos have hatched.

Mitigation Measure BIO-1B

A hydroacoustic assessment shall be completed to determine which construction activities will produce sounds levels that could result in take of listed fish species. Based on assessment findings, appropriate measures (e.g., sound attenuation or work window restrictions) shall be incorporated into project authorization requests. All avoidance measures, monitoring, reporting, timing, and work limit requirements established within the Agency consultation and/or authorization shall be fully implemented. Any identified compensatory mitigation shall be completed consistent with agency consultation and authorization requirements.

Disturbances to Special-Status Birds

While impacts to state and federally listed birds are not expected to occur as a result of Project-related activities, impacts to nesting birds, protected pursuant to the MBTA and California Fish and Game Codes, could occur as a result of Project implementation. Active nests (i.e., nests with viable eggs and/or chicks) may be affected by Project-related activities that result in nest abandonment or destruction. While birds nesting on landside or marine structures and vegetation are likely habituated to the current high levels of local traffic and other activity (from watercraft, cars, and pedestrians), Project activities could lead to nest abandonment.

While impacts on state and federally listed birds are not expected to occur as a result of Project-related activities, impacts on nesting birds, protected pursuant to the MBTA and California Fish and Game Code, could occur as a result of Project implementation. The following plans, controls, and AMMs, which are further described in Attachment A, would be implemented to avoid or minimize impacts on special status birds:

- Environmental Compliance Management Plan (e.g., specifies monitoring/ inspection and reporting requirements)
- Worker Environmental Awareness Training (e.g., training with the project biologist on permit and other requirements and consequences of non-compliance)
- Biological Control Measures and AMMs (e.g., work window, pile installation and removal restrictions).

Combined with the plans, controls, and AMMs implementation of the following mitigation measure would reduce potential Project-related impacts on special-status bird species to less than significant.

Mitigation Measure BIO-2

Project activities that could impact nesting birds will be scheduled to greatest extent practicable to avoid the nesting season (February 1 to August 31). If it is not possible to schedule such activities to occur between September 1 and January 31, a pre-construction nesting bird survey of all suitable nesting habitat within the zone of influence shall be conducted by a qualified biologist within 7 days prior to commencement of construction activities scheduled to occur within the nesting season. The zone of influence would include the area immediately surrounding the work location that supports suitable nesting habitat that could be affected by the Project due to visual or auditory disturbance associated with construction activities scheduled to occur during the nesting season. If no nesting birds are observed during the survey, construction activities may commence as planned.

If nesting birds are observed during the survey, the qualified biologist shall review results with the Project sponsor and contractor and evaluate whether the schedule of construction activities could affect the active nests and recommend measures to the project biologist based on the PG&E Nesting Bird Management Plan, which could include a non-disturbance buffer shall be established (e.g., 50 feet for non-raptors and 250 feet for raptors). This buffer shall remain in place until the young have been determined (by a qualified biologist) to have fledged. These buffers may be modified (e.g., by reducing their size or installing a blind) as deemed appropriate by the project biologist in coordination with the USFWS and CDFW.

A brief survey report documenting the preconstruction survey area and findings shall be prepared by the qualified biologist and submitted to the Project sponsor prior to initiation of construction during the nesting season. The report shall document presence or absence of any active nests and prescribe a suitable non-disturbance buffer if active nests are present and could be disturbed by Project-related activities. No report of findings is required if construction is initiated during the non-nesting season (September 1 to January 31) and continues uninterrupted according to the above criteria.

If any birds begin nesting within active work areas after construction has commenced, they will be nesting in an environment with high levels of existing and ongoing disturbance and a no work exclusion buffer shall be established around the active nests. However, the qualified biologist shall monitor the nest twice a week. If the qualified biologist determines that birds are showing signs of distress associated with construction (e.g., frequent vocalization or flushing from the nest), a non-disturbance buffer shall be established as determined by the qualified biologist.

Disturbances to Special-Status Invertebrates

Two species of note that have the potential to occur within the Project Area are Dungeness crab (which is of commercial importance) and native oysters. Though a formal survey or evaluation for the presence of native oysters has not been completed, the Project Area could support the presence of native Olympia oysters near the riprap shoreline within the intertidal zone.

The degraded nature of the offshore areas due to vessel traffic (which causes frequent increases in turbidity) diminishes potential for greater than low-density occupation of shoreline riprap by invertebrates. Work within this zone would be limited to replacement of 400 square feet of missing riprap. Installation of the approximately 20 -foot strip of additional armoring placed over soft sediments between the capped/armored locations and the existing shoreline riprap revetment area to tie the capped/armored area into the existing shoreline zone could increase structural complexity and potential suitable substrate for Olympia oyster colonization.

It is possible that Dungeness crabs could be present within the Project Area. However, improvement of the Project Area through removal of contaminated sediments would improve habitat for this species in the long term. Both species would be primarily located within the intertidal zone within the existing shoreline stabilization (riprap).

Special-status invertebrates could be affected as a result of project implementation. The following plans, controls, and AMMs, which are further describe in Attachment A, would be implemented to minimize impacts on special-status invertebrates:

- Environmental Compliance Management Plan (e.g., specifies monitoring/inspection and reporting requirements)
- Sound Attenuation and Monitoring Plan (e.g., provides guidelines for assessing and mitigating airborne and in-water noise produced)
- Stormwater Pollution Prevention Plan and/or Erosion Sediment Control Plan (e.g., describes methods for addressing potential site- related stormwater runoff)
- Dredging and Capping Operations Plan (e.g., provides approach and sequencing to reduce water quality and other impacts)
- Surface Water Quality Monitoring Plan (e.g., describes procedures and practices to protect water quality)
- Marine Invasive Species Control Plan (e.g., provides methods to contain the spread of non-native species)
- Biological Control Measures and AMMs (e.g., pile installation and removal restrictions, work windows).

Combined with the plans, controls, and AMMs and requirements imposed through the permitting process, implementation of the following mitigation measure would reduce the potential Project-related impacts on special-status invertebrates to less than significant.

Mitigation Measure BIO-3

Prior to construction, a native oyster survey will be completed. If oysters are within or immediately adjacent to the Project Area, it shall first be determined whether avoidance of the beds is feasible. If feasible, impacts on the oyster bed shall be avoided. If complete avoidance is not feasible, the Project sponsor shall request guidance from the NMFS regarding the need for and/or feasibility of moving affected beds. Translocation of oyster beds shall be consistent with methods and recommendations presented in Shellfish Conservation and Restoration in San Francisco Bay: Opportunities and Constraints (Zabin et al. 2010).

Disturbances to Special-Status Marine Mammals

Marine mammals rely on sound for foraging, navigating, and communicating and are sensitive to noise-related effects generated by construction activities. Project-related activities that have the potential to result in the incidental harassment of marine mammals due to elevated in-water and/or airborne sound levels include (but are not limited to) dredging, capping/armoring, and pile installation and removal. Dredging and capping operations may produce noise of a sufficient level to behaviorally harass marine mammals (in the form of short-term reactions such as startle or alert reactions) at K Dock. Vibratory pile driving produces non-impulse (continuous) noise that can cause behavioral disturbance in marine mammals and a temporary threshold shift in an animal’s hearing. Both behavioral disturbance and temporary threshold shift are considered Level B harassment. At very close ranges, these non-impulse sounds from vibratory pile driving can also cause slight injury in the form of permanent threshold shift in an animal’s hearing, which is a form of Level A harassment. Pile proofing, which is short-duration impact pile driving, produces impulse sounds that can cause behavioral disturbance and temporary threshold shift in marine mammals (Level B harassment) and slight injury in the form of permanent threshold shift in an animal’s hearing (Level A harassment). General in-water work activities, including placement of armoring, can also result in harassment of marine mammals. Protected mammals could be affected as a result of Project implementation.

In addition, dock relocation during dredging would make the haul-outs temporarily unavailable, but structures throughout the waterfront would continue to be available and the marine mammals would temporarily relocate to an adjacent structure. Turbidity curtains generally do not affect marine mammal access to the waterfront or preclude their mobility. The following plans, controls, and AMMs, which are further described in Attachment A, would be implemented to reduce disturbances to special-status marine mammals:

- Environmental Compliance Management Plan (e.g., specifies monitoring/inspecting and reporting requirements)
- Sound Attenuation and Monitoring Plan (e.g., provides guidelines for assessing and mitigating airborne and in-water noise produced)
- Marine Mammal Monitoring Plan (e.g., observation guidelines for spotting marine mammals, hydroacoustic monitoring limits, acoustic threshold zones, and protocols for minimizing harassment and stop work provisions)
- Worker Environmental Awareness Training (e.g., training with the project biologist on permit and other requirements and consequences of non-compliance)
- Biological Control Measures and AMMs (e.g., pile installation and removal restrictions, work windows).

An IHA, with the purpose of minimizing effects to marine mammals, would be required pursuant to the MMPA. All terms and/or conditions (e.g., monitoring, reporting, timing, and work limits) established within the agency authorization must be fully implemented (BIO-4). Any identified compensatory mitigation would be completed consistent with agency consultation and authorization requirements.

Combined with the plans, controls, and AMMs, and the requirements imposed through the permitting process, implementation of the following mitigation measure would reduce potential Project-related impacts onto special- status mammal species to less than significant.

Mitigation Measure BIO-4

A hydroacoustic assessment shall be completed to determine which construction activities could produce sounds levels that could result in harassment of marine mammals (Level A or B). Based on assessment findings, appropriate measures (e.g., monitoring during specified work activities with stop work authority) shall be incorporated into an IHA or LOA application (for MMPA and FESA protected species). All monitoring, reporting, timing, and work limit requirements established within the project authorizations shall be fully implemented. Any identified compensatory mitigation shall be completed consistent with agency consultation and project authorization requirements.

Intertidal and Subtidal Habitat Disturbance

Remediation activities have the potential to temporarily disturb and alter intertidal and subtidal habitats used by special-status species through placement of up to 10 acres of fill for the purpose of construction of the cap and erosion protection. Work within the intertidal zone would be limited to replacement of 400 square feet of missing riprap. Installation of the approximately 20-foot strip of additional armoring placed over soft sediments between the capped/armored locations and the existing shoreline riprap revetment area to tie the capped/armored area into the existing shoreline zone could increase structural complexity and potential suitable substrate for Olympia oyster colonization.

Although dredging and capping will disturb the benthos, benthic communities are known to be resilient and elastic assemblages, with rapid recovery rates promoted by proximal undisturbed communities which can provide colonizing larvae (Rosenberg et al. 2002; Dernie et al. 2003). A 2003 study on the recovery of soft sediment communities and habitat following physical disturbance demonstrated insignificant changes in environmental parameters between control and disturbed sediment locations as early as 14 days after disturbance, with recovery of associated species assemblages trailing behind and correlated with infill rates of disturbed sites (Dernie et al. 2003). The dredged and capped areas are expected to be replenished with habitable sediments (due to natural accretion) within several months to a few years (Oliver et al. 1977; Watling et al. 2001). The remedy would result in long-term beneficial improvement to the habitat by either removing or physically isolating the PAHs from fauna, flora, and the habitats present. Once contaminated sediment is removed, a cap and/or armor layer would be placed within most removal areas to isolate any potentially impacted sediment left in place. The proposed cap design is based on engineering analysis that shows the effectiveness of the cap in terms of chemical isolation and protection against erosion, which would further minimize habitat loss or degradation.

Intertidal and subtidal habitats could be affected as a result of Project implementation. The following plans, controls, AMMs, and requirements imposed through the permitting process, which are further described in Attachment A and Table 4-5, would be implemented to minimize impacts to intertidal and subtidal habitats:

- Environmental Compliance Management Plan (e.g., specifies monitoring/inspecting and reporting requirements)
- Sound Attenuation and Monitoring Plan (e.g., provides guidelines for assessing and mitigating airborne and in-water noise produced)
- Stormwater Pollution Prevention Plan and/or Erosion and Sediment Control Plan (e.g., describes methods for addressing potential site- related stormwater runoff)
- Dredging and Capping Operations Plan (e.g., provides approach and sequencing to reduce water quality and other impacts)
- Surface Water Quality Monitoring Plan (e.g., describes procedures and practices to protect water quality)
- Marine Invasive Species Control Plan (e.g., provides methods to contain the spread of non-native species)
- Worker Environmental Awareness Training (e.g., training with the project biologist on permit and other requirements and consequences of non-compliance)
- Biological Control Measures and AMMs (e.g., pile installation and removal restrictions, work windows).

With implementation of these plans, controls, AMMs, and requirements imposed through the permitting process, the potential Project-related impacts on intertidal and subtidal habitats would be less than significant.

b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? **(*Less Than Significant Impact*)**

The Project Area does not include riparian habitat. The Project Area is located within designated critical habitat for green sturgeon, steelhead, and Chinook salmon. The entire Bay is classified as EFH for species managed under the Pacific Coast Salmon FMP (coho and Chinook salmon), the Coastal Pelagic Species FMP, and Pacific Coast Groundfish FMP.

Effects on critical habitat and EFH could occur due to removal of sediment and placement of the cap resulting in temporary disturbance of benthic habitat. Increased shading is not expected, as no new overwater structures are proposed. Within the Pacific Coast Groundfish FMP, rocky reefs, defined as waters, substrate, or other biogenic features associated with hard substrate (bedrock, boulders, cobble, gravel etc.), are identified as a habitat type within EFH that may qualify as a HAPC. As such, placement of a cap may effectively create a rock reef benefiting groundfish species.

Some portion of PAHs adsorbed to sediment particles may be released into surface water as "dissolved-phase" contaminants. Dredging elutriate testing (DRET) reported in the RI Report (Haley & Aldrich 2020b) and the FS/RAP (Haley & Aldrich 2021) has demonstrated that effects on surface water quality are temporary and primarily associated with suspended particles. Dredging may expose contaminated sediments; however, the exposure would be temporary until the sediment cap is placed. These short-term effects are minor compared to the potential long-term adverse effects of failure to implement the Project (sustained levels of PAHs in surficial sediment over the RAL within the Project Area). Avoidance measures, specifically the use of turbidity curtains to surround remedial response areas, would isolate the effects to the smallest area practicable.

The following plans, controls, and AMMs, which are further described in Attachment A, would be implemented to reduce disturbances to sensitive natural communities:

- Environmental Compliance Management Plan (e.g., specifies monitoring and/or inspecting and reporting requirements)
- Sound Attenuation and Monitoring Plan (e.g., provides guidelines for assessing and mitigating airborne and in-water noise produced)
- Storm Water Pollution Prevention Plan and/or Erosion and Sediment Control Plan (e.g., describes methods for addressing potential site- related stormwater runoff)
- Dredging and Capping Operations Plan (e.g., provides approach and sequencing to reduce water quality and other impacts)
- Surface Water Quality Monitoring Plan (e.g., describes procedures and practices to protect water quality)
- Marine Invasive Species Control Plan (e.g., provides methods to contain the spread of non-native species)
- Biological Control Measures and AMMs (e.g., pile installation and removal restrictions, work windows).

With the plans, controls, and AMMs and requirements imposed through the permitting process, the potential Project-related impacts on sensitive natural communities would be less than significant.

c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? **(*Less Than Significant Impact*)**.

To meet the USACE definition of wetland, an area must demonstrate three critical characteristics: wetland vegetation, wetland hydrology, and wetland soils. There are no wetlands identified in the Project Area, therefore, the Project would have no impact on wetlands.

The Bay is a WOTUS and is regulated by USACE under Section 404 of the CWA and under Section 10 of the RHA. These waters also are regulated by the Regional Water Board as waters of the State (through a Section 401 CWA certification) and by BCDC, which has jurisdiction over all areas of the Bay that are subject to tidal action as well as a 100-foot shoreline band.

Project activities would result in temporary alteration of the Bay seafloor where sediments are removed and where capping/armoring is placed. Project activities are not expected to result in a loss of WOTUS, as fill would not cause a loss in the surface area or volume of the Bay. Short-term adverse effects, associated with increases in turbidity, acoustic disturbance, and temporary reduction in fine sediment in the upper portions of the sediment profile, would occur. However, work would not result in a long-term loss of functions and values provided by the aquatic resource, as the Project would not result in an increase in the built environment (i.e., constructed structures or features) within the Bay.

Prior to placement of fill within the Bay, permits/authorization from USACE, Regional Water Board, and BCDC would be secured. All terms and/or conditions (e.g., monitoring, reporting, timing, and work limits) established within the authorizations would be fully implemented. Any identified compensatory mitigation identified within project authorizations would be completed consistent with authorization requirements. Project design would fully incorporate compliance with policies established within the Bay Plan.

Under the MPRSA and Section 404(b)(1) of the CWA, USACE is the federal agency that manages permits authorizing the ocean disposal of dredged materials. There are specific testing requirements to determine whether the material is suitable for unconfined aquatic disposal at SF-DODS. USACE must obtain concurrence from EPA for any disposal at SF-DODS before it can approve a permit.

Since 1996, as part of the LTMS, the DMMO, an interagency team represented by state and federal agencies, has been promoting economically and environmentally sound dredging practices and placement of dredged sediment in the Bay with the purpose of increasing efficiency and consistency in the permitting process and fostering a comprehensive and consolidated approach to dredged sediment management issues. All dredging activities must be implemented consistent with the standards and procedures set forth by the LTMS and associated NFMS Biological Opinion, FESA Section 7(a)(2) Biological Opinion, LTMS, NMFS Consultation Number: WCR-2014-1599, dated July 9, 2015. These standards and procedures address projects permitted through the DMMO. While the project would not qualify for coverage under this Biological Opinion, which was issued for navigational dredge projects, all dredging activities will be implemented consistent with the standards and procedures set forth within this Biological Opinion for consistency with established regional resource protective measures.

With the plans, controls, and AMMs and requirements imposed through the permitting process, potential Project effects on WOTUS would be less than significant.

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? **(*Less Than Significant Impact*)**

The proposed work would also not result in a change to condition (i.e., a barrier to fish passage) that would prevent continued passage through the Project Area in the long-term. As discussed above, the Project Area itself is a heavily modified and well-used waterfront. Nevertheless, herring are known to spawn in the Project Area and sea lions and Pacific harbor seals are consistent visitors within the Project Area Without mitigation, effects on herring, sea lions and Pacific harbor seals could include temporary degradation of water quality due to turbidity and temporary, intermittent underwater sound alterations.

To avoid these impacts, mitigation measures to be implemented include work windows to ensure that water quality and sound disturbances do not occur during critical times in the herring, sea lion, and Pacific harbor seal life cycles. The following plans, controls, and AMMs, which are further described in Attachment A:

- Environmental Compliance Management Plan (e.g., specifies monitoring/ inspection and reporting requirements)
- Sound Attenuation and Monitoring Plan (e.g., provides guidelines for assessing and mitigating airborne and in-water noise produced)
- Stormwater Pollution Prevention Plan and/or Erosion and Sediment Control Plan (e.g., describes methods for addressing potential site- related stormwater runoff)
- Dredging and Capping Operations Plan (e.g., provides approach and sequencing to reduce water quality and other impacts

- Surface Water Quality Monitoring Plan (e.g., describes procedures and practices to protect water quality)
- Marine Invasive Species Control Plan (e.g., provides methods to contain the spread of non-native species)
- Worker Environmental Awareness Training (e.g., mandatory environmental education program)
- Biological Control Measures and AMMs (e.g., pile installation and removal restrictions, work windows).

With implementation of these plans, controls, and AMMs and requirements imposed through the permitting process, the potential Project-related impacts on wildlife corridors or wildlife nurseries would be less than significant.

e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? **(*Less Than Significant Impact*)**

There are no local policies or ordinances of the City and County of San Francisco that apply to marine habitats or associated marine biological communities. San Francisco's Public Works Code prohibits construction work from harming street trees or landscaping and requires protective measures to be taken to prevent damage to trees if work will take place within the drip line of any street trees. Landside staging and/or access would not occur within the dripline of any onsite trees. Project implementation would not otherwise result in damage to trees protected pursuant to the San Francisco Public Works Code. Therefore, the Project would not conflict with local policies and ordinances protecting biological resources.

The San Francisco Bay Subtidal Habitat Goals Report was developed to provide a Bay-wide approach to setting science-based goals for maintaining a healthy, productive, and resilient ecosystem within the submerged areas of the Bay (California State Coastal Conservancy et al. 2010). The Subtidal Habitat Goals Report has set resource management goals and criteria for soft and hard subtidal substrate, artificial structures, macroalgae beds, and shellfish beds. The Subtidal Habitat Goals Report includes habitat conservation goals that promote allowing no net loss or disturbance of soft bottom and rock habitats (subtidal and intertidal zones), enhancing habitat function of artificial structures, minimizing placement of artificial structures detrimental to subtidal habitat function, protecting native shellfish habitat and existing eelgrass habitat, and protecting macroalgae beds (*Fucus* and *Gracilaria* spp.). The Subtidal Habitat Goals Project provides guidance to regulatory agencies; however, it is not a permitting mechanism. The Project would comply with the Subtidal Habitat Goals Report, as the minimum necessary placement of fill has been chosen to meet the Project purpose, which is to achieve the RAOs for the remediation. Ultimately, the Project would improve the natural environment through containment of PAHs and would not result in unnecessary conversion of Bay habitat. The Project would therefore not conflict with the guidance provided within the Subtidal Habitat Goals Report.

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? **(*No Impact*)**

No habitat conservation plans have been prepared addressing the Project Area, and therefore the Project would not conflict with any adopted habitat conservation plans.

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5.5 Cultural and Tribal Cultural Resources

Would the project:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significa nt Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?	☐	☒	☐	☐
b. Cause a substantial adverse change in the significance of an archeological resource pursuant to § 15064.5?	☐	☒	☐	☐
c. Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐
d. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)	☐	☒	☐	☐
e. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the	☐	☒	☐	☐

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significa nt Impact	No Impact
significance of the resource to a California Native American tribe.				

Project Activities Likely to Create an Effect:

- In-water construction activities (e.g., debris removal, dredging, pile driving/removal, capping/armor placement, and slope stabilization)

Existing Environmental Conditions**:**

A cultural resource assessment was conducted by the archaeological consulting firm Alta Archaeological Consulting, LLC (Alta Archaeological Consulting 2020; Attachment D[2]). The assessment contains confidential information about the locations and characteristics of archaeological sites and therefore is not included in this IS for public review. The assessment can be made available to agencies and other professionals for review as necessary.

Given that the Project Area is completely within submerged lands, below the high-water mark of the Bay, traditional cultural resource inventory efforts (e.g., pedestrian survey) were not feasible. Instead, research methods entailed archive research and literature review (records, maps, and photographs), a visual assessment of the area, and the development of a predictive model to assess the potential for submerged prehistoric archaeological resources within the Project Area.

Review of historic registers and inventories indicates that the Project Area is within the Port of San Francisco Embarcadero Historic District (NRHP District #06000372). This historic district is composed of piers, a bulkhead wharf, a seawall, the Ferry Building, and various other buildings along a 3-mile stretch of the San Francisco waterfront. Many individual buildings and resources within the district are eligible for NRHP listing.

A review of archaeological site and survey maps revealed that 45 cultural resource studies have been previously performed within a ½-mile radius of the Project Area. One study (S-048492) has been conducted within the Project Area. S-048492 is a historic resources database for the Port of San Francisco. This study did not include a field survey. Approximately 90 percent of the ¼-mile radius surrounding the Project Area has been previously surveyed.

Archival research, including the analysis of historical maps, indicates that the Project Area has been completely under the waters of the Bay throughout the historic period. In the 19th and early 20th centuries, a substantial amount of Bay fill was added to the area south of the Project Area (now inland). By about 1913, the shoreline roughly followed the current alignment, and by 1938, the current configuration of wharfs and piers was in place. The archival research did not identify record of any shipwrecks in the Project Area.

The site sensitivity assessment indicated that the Project Area has a low ranking for containing prehistoric habitation. No highly productive environments (tidal marshes and sloughs) or sources of fresh water (creeks or lakes) are situated within 1,000 meters of the Project Area. The Project Area

[2] Available Upon Request. Note: Sensitive information on archaeological resources located within the vicinity of the Project Area may be redacted.

is considered to have a low sensitivity for containing submerged unidentified prehistoric archaeological resources.

Regulatory Framework:

California Register of Historical Resources

The California Register of Historical Resources is designed to “identify, evaluate, register and protect California's historical resources. The Register is the authoritative guide to the state's significant historical and archeological resources” (California Office of Historic Preservation 2020).

A resource may be eligible for listing in the California Register of Historical Resources if it:

1) Is associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States;
2) Is associated with the lives of persons important to local, California, or national history;
3) Embodies the distinctive characteristics of a type, period, region, or method of construction or represents the work of a master or possesses high artistic values; or
4) Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation. (California Office of Historic Preservation 2020).

The eligibility of archaeological sites is usually evaluated under Criterion 4—their potential to yield information important to prehistory or history. Criterion 3 is most often applied to built environment resources (e.g., buildings, fences, and landscape features). Whether or not a site is considered important is determined by the capacity of the site to address pertinent local and regional research themes. Public Resources Code Section 21084.1 stipulates that any resource listed in or eligible for listing in the California Register of Historical Resources is presumed to be historically or culturally significant.

Assembly Bill 52

Assembly Bill (AB) 52 established a consultation process with all California Native American tribes identified by the Native American Heritage Commission (NAHC) as having cultural ties to an area and created a new class of resources under CEQA known as tribal cultural resources.

Pursuant to CEQA Section 21080.3.1(d), within 14 days of a determination that an application for a project is complete or a decision by a public agency to undertake a project, the Lead Agency is required to contact the Native American tribes that are culturally or traditionally affiliated with the geographic area in which the project is located. Notified tribes have 30 days to request consultation with the Lead Agency to discuss potential impacts on tribal cultural resources and measures for addressing those impacts.

Several tribes have sent request for notification letters to the Regional Water Board indicating that they are traditionally and culturally affiliated with a geographic area within the agency’s geographic area of jurisdiction and requested formal notice of and information on proposed projects for which the Regional Water Board would serve as a lead agency under CEQA. For each tribe that has sent the Regional Water Board a request for notification letter, the Regional Water Board reviewed information regarding the geographic area of the tribe relative to the Project Area. The Regional Water Board determined that the territories of these tribes do not fall within the Project Area.

NAHC was contacted in writing on June 10, 2019, to review the Sacred Lands files for any resources present within the Project Area and to request a CEQA Tribal Consultation List pursuant to AB 52. NAHC responded on June 18, 2019, stating that a search of the Sacred Lands files was negative and no resources are known within the Project Area. NAHC provided a list of five Native American tribal organizations that may have traditional knowledge of cultural resources in the area.

On February 19, 2020, the Regional Water Board mailed information request letters to the five tribes identified on the NAHC list for the Project Area. The letters were sent via certified U.S. mail. Subsequently, the Water Board received the signed receipt cards for all five letters. In the letters, the Regional Water Board requested that the tribes respond by April 10, 2020. To date, with the exception of the signed certified mail receipt cards, the Regional Water Board has not received any calls, voicemail messages, email messages, or physical mail related to the information request letters. To date, no response has been received from Native American tribes consulted as part of outreach activities for the Project.

Evaluation of Environmental Effects:

a. Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5? (***Less Than Significant with Mitigation Incorporated***)

The cultural resource assessment (Alta Archaeological Consulting 2020) concluded that the Project would be located within an area that is heavily disturbed as a result of dredging for navigation and construction associated with industry, tourism, and transportation, and that the Project would not cause a substantial adverse change in the significance of historical resource. One previously documented cultural resource, the Pier 43 Ferry Arch, which is part of the Port Embarcadero Historic District (P-38-004890) and a contributing element to the namesake NRHP District (#06000372), is identified within the Project Area. The Pier 43 Ferry Arch is part of the built environment and above the high-water mark, and the Project would have no adverse impact on the resource.

There is a low potential for intact historical resources to be discovered or disturbed during remediation dredging activities because dredging would occur in recent sediments that have been previously disturbed. However, isolated historical artifacts associated with pier construction and/or local commerce may occur in the Project Area. Though unlikely, the Project could cause a substantial adverse change in such resources if they are discovered or disturbed during Project activities. Implementation of the following mitigation measure would reduce potential Project-related impacts on historical resources to less than significant.

A control measure (described in Attachment A) would be implemented requiring Project construction crews to be trained in basic historical resource identification prior to beginning implementation of the remediation activities. The training would also clearly outline the procedures in the event of an historical resource discovery, including temporary work stoppage of all ground disturbance, short-term physical protection of artifacts and their context, and immediate advisement of the archaeological/tribal team and PG&E or their representatives. The combination of this control measure and implementation of Mitigation Measure CUL-1 would reduce potential Project-related impacts on historical resources to less than significant.

Mitigation Measure CUL-1

In the unlikely event that previously unidentified archaeological, cultural, tribal cultural, or historical sites, artifacts, or features are uncovered during remediation, work shall be suspended within 100 feet (30 meters) of the find and redirected to another location. A qualified professional archaeologist shall be contacted immediately to examine the discovery. Project personnel shall not collect cultural resources. If the discovery can be avoided or protected and no further impacts would occur, the resource shall be documented on California Department of Parks and Recreation 523 forms, and no further effort shall be required.

If the resource cannot be avoided and may be subjected to further impacts, PG&E or its representative shall evaluate the significance of the discovery following federal and state laws outlined above and implement data recovery or other appropriate treatment measures if warranted.

Evaluation of historical-period resources shall be done by a qualified historical archaeologist, whereas evaluation of prehistoric resources shall be done by a qualified archaeologist specializing in California prehistoric archaeology. If tribal cultural materials are present, the archaeologist shall contact and coordinate with the relevant Tribal Historic Preservation Officer(s). Evaluations may include archival research, oral interviews, and/or field excavations to determine the full depth, extent, nature, and integrity of the deposit.

b. Cause a substantial adverse change in the significance of an archeological resource pursuant to § 15064.5? **(*Less Than Significant with Mitigation Incorporated*)**

There is a low potential for intact archaeological resources to be discovered during remediation activities because dredging would occur in recent sediments that have been previously disturbed. Therefore, the Project Area is considered to have a low sensitivity for containing submerged unidentified prehistoric archaeological resources.

A control measure (described in Attachment A) would be implemented requiring Project construction crews to be trained in basic archaeological and tribal cultural resource identification prior to beginning implementation of the remediation activities. The training would also clearly outline the procedures in the event of an archaeological discovery, including temporary work stoppage of all ground disturbance, short-term physical protection of artifacts and their context, and immediate advisement of the archaeological/tribal team and PG&E or their representatives. The combination of this control measure and implementation of Mitigation Measure CUL-1 would reduce potential Project-related impacts on archaeological resources to less than significant.

c. Disturb any human remains, including those interred outside of formal cemeteries? **(*Less Than Significant with Mitigation Incorporated*)**

Potential historic use of the Project Area as a cemetery was not identified in the cultural resource assessment (Alta Archaeological Consulting 2020). Human graves outside of formal cemeteries are often associated with prehistoric occupation sites, but human remains found in recent historically deposited sediments would most likely be victims of drownings or malicious events. Section 7050.5 of the California Health and Safety Code states that it is a misdemeanor to knowingly disturb a human burial, and Section 5097.99 of the California Public Resources Code defines the obtaining or possession of Native American remains or grave goods to be a felony.

Implementation of the following mitigation measure would reduce potential Project-related impacts on human remains to less than significant.

Mitigation Measure CUL-2

If human remains are encountered, all work shall stop in the immediate vicinity (within 100 feet) of the discovered remains and the County Coroner (or the City and County of San Francisco Medical Examiner) shall be notified. In addition, a qualified archaeologist shall be notified immediately so that an evaluation can be performed. If the remains are deemed to be Native American and prehistoric, the Coroner must contact NAHC so that a “Most Likely Descendant” can be designated and further recommendations regarding treatment of the remains can be provided.

If the remains are not Native American, the Coroner will consult with the archaeologist and the Lead Agency to develop a procedure for the proper study, documentation, and ultimate disposition of the remains. If a determination can be made as to the likely identity of the remains—either as an individual or as a member of a group—an attempt shall be made to identify and contact any living descendants or representatives of the descendant community. As interested parties, these descendants may make recommendations to the owner, or representative, for the treatment or disposition, with proper dignity, of the remains and grave goods.

d. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)? **(*Less Than Significant with Mitigation Incorporated*)**

No tribal cultural resources were identified in the cultural resource assessment. Based on the methods used to conduct that assessment, there is a low potential for intact tribal cultural resources to be discovered during remediation dredging activities because dredging would occur in recent sediments that have been previously disturbed.

Implementation of Mitigation Measures CUL-1 and CUL-2, in addition to the control measure (described in Attachment A) requiring Project construction crews to be trained in basic archaeological and tribal cultural resource identification and outlining the procedures in the event of an archaeological discovery, would reduce potential Project-related impacts on tribal cultural resources to less than significant.

e. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe? **(*Less Than Significant with Mitigation Incorporated*)**

Alta Archaeological Consulting (2020) concluded that the Project would not cause a substantial adverse change in the significance of a tribal cultural resource, as defined in Public Resources Code Section 21074, because dredging would occur in recent sediments that have been previously disturbed. Further, consultation with NAHC did not yield identification of any sacred resources. The Regional Water Board's request sent to five tribes identified by NAHC that may have traditional knowledge of the area also did not yield any responses. Thus, there is a low potential for intact tribal cultural resources to be discovered during remediation dredging activities. Though unlikely, the Project could cause a substantial adverse change in such resources if they are discovered during Project activities.

Implementation of Mitigation Measures CUL-1 and CUL-2, in addition to the control measure (described in Attachment A) requiring Project construction crews to be trained in basic archaeological and tribal cultural resource identification and outlining the procedures in the event of an archaeological discovery, would reduce potential Project-related impacts on tribal cultural resources to less than significant.

References:

1. Alta Archaeological Consulting 2020. Cultural Resource Assessment Pier 39 to 43.5 Sediment Remediation Project San Francisco, California.

2. California Office of Historic Preservation. 2020. California Register of Historic Places. Available at: https://ohp.parks.ca.gov/?page_id=21238.

5.6 Energy

Would the project:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation?	☐	☐	☒	☐
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

Project Activities Likely to Create an Effect:

- In-water construction activities (e.g., dredging, debris removal, capping, pile driving/removal, capping/armor placement, and slope stabilization)
- Barge transport of materials and transport of workers
- Trucking/transportation of dredged material and debris to landfills and other disposal facilities
- Import of materials to Project Area
- Material handling

Existing Environmental Conditions:

Energy consumption is closely tied to the issues of air quality and greenhouse gas emissions, as the burning of fossil fuels and natural gas for energy has a negative impact on both, and petroleum and natural gas currently supply most of the energy consumed in California.

In general, California's per capita energy consumption is relatively low, in part due to mild weather that reduces energy demand for heating and cooling, and in part due to the government's proactive energy-efficiency programs and standards. According to the California Energy Commission's (CEC) 2015 Integrated Energy Policy Report, Californians consumed about 280,500 gigawatt-hours (GWh) of electricity in 2014 and 13,240 million British thermal units (BTU) of natural gas in 2013. The CEC estimates that by 2025, California's electricity consumption will reach between 297,618 GWh and 322,266 GWh, an annual average growth rate of 0.54 to 1.27 percent (CEC 2015), and natural gas consumption is expected to reach between 12,673 million and 13,731 million BTU by 2024, an average annual growth rate of -0.4 to 0.33 percent (CEC 2015).SFPUC provides electricity to San Francisco via hydroelectric power generated by the Hetch Hetchy Project located in Tuolumne County, California (SFPUC 2020). The SFPUC provides more than 376,000 San Francisco residents and businesses with hydroelectric power. In 2019, total electricity use in San Francisco County was approximately 5,604 million kilowatt hours (kWh), including approximately 1,503 million kWh of consumption for residential land uses and approximately 4,100 million kWh of consumption for non-residential land uses (CEC 2020).

Energy conservation refers to efforts made to reduce energy consumption to preserve resources for the future and reduce pollution. It may involve diversifying energy sources to include renewable energy, such as solar power, wind power, wave power, geothermal power, and tidal power, as well as the adoption of technologies that improve energy efficiency and adoption of green building practices. Energy conservation can be achieved through increases in efficiency in conjunction with decreased energy consumption and/or reduced consumption from conventional energy sources.

Regulatory Framework:

Federal Regulations

Fuel efficiency standards for medium- and heavy-duty trucks have been jointly developed by the EPA and the National Highway Traffic Safety Administration. Phase 1 heavy-duty truck standards apply to heavy-duty pickup trucks and vans, combination tractors, and vocational vehicles for model years 2014 through 2018 and result in a reduction in fuel consumption from 6 to 23 percent over the 2010 baseline, depending on the vehicle type (USEPA 2011). The EPA and National Highway Traffic Safety Administration also adopted the Phase 2 heavy-duty truck standards, which cover model years 2021 through 2027 and require the phase-in of a 5 to 25 percent reduction in fuel consumption over the 2017 baseline depending on the compliance year and vehicle type.

State Regulations and Plans

California Energy Action Plan

In 2003, the three central energy agencies in California—the California Public Utilities Commission, the California Energy Commission (CEC), and the California Power Authority—adopted the Energy Action Plan, which listed goals for California's energy future and actionable steps to achieve these goals. The fuels used in the transportation of California's goods and population constitute a third facet of the energy sector, in addition to electricity and natural gas. To build an efficient, multi-fuel transportation market to serve the future needs of California citizens, the Energy Action Plan has detailed several key actions such as increase in the use of high-efficiency, fuel flexible vehicles and dedicated non-petroleum-fueled vehicles in the state's fleet of passenger cars and light-duty trucks, as well as in the state's fleet of medium- and heavy-duty on-road and off-road vehicles (CPUC, CEC, and CPA 2005).

California Global Warming Solutions Act

In 2006, the California legislature passed the California Global Warming Solutions Act (CARB 2018). Assembly Bill (AB) 32 requires the CARB to design and implement emission limits, regulations, and other measures, such that feasible and cost-effective statewide greenhouse gas (GHG) emissions are reduced to 1990 levels by 2020 (representing a 25 percent reduction from forecast emission levels). One specific requirement of AB 32 is to prepare a "scoping plan" for achieving the maximum technologically feasible and cost-effective GHG emission reductions by 2020. The initial scoping plan was approved in 2008, as required by AB 32, and reapproved in 2011. The initial scoping plan contained a mix of recommended strategies that combined direct regulations, market-based approaches, voluntary measures, policies, and other emission reduction programs calculated to meet the 2020 statewide GHG emission limit and initiate the transformations needed to achieve the State of California's long-range climate objectives.

Pursuant to AB 32, CARB adopted a scoping plan in December 2008, outlining measures to meet the 2020 GHG reduction limits. The scoping plan is the state's overarching plan for addressing climate change. To meet these goals, California must reduce its GHG emissions by 30 percent below projected 2020 business-as-usual emission levels, or about 15 percent from 2008 levels.

The first update to the scoping plan was approved by CARB on May 22, 2014, and builds upon the initial scoping plan with new strategies and recommendations. The first update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. The first update defines CARB's climate change priorities for the next 5 years and also sets the groundwork to reach long-term goals. The first update highlights California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the initial scoping plan. It also evaluates how to align the State's "longer-term" GHG reduction strategies with other state policy priorities for water, waste, natural resources, clean energy, transportation, and land use.

CARB Heavy-Duty On-Road and Off-Road Vehicle Regulations

In 2004, CARB adopted an Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling to reduce public exposure to diesel particulate matter emissions (Title 13 CCR Section 2485). This measure applies to diesel-fueled commercial vehicles with gross vehicle weight ratings greater than 10,000 pounds that are licensed to operate on highways, regardless of where they are registered. This measure does not allow diesel-fueled commercial vehicles to idle for more than 5 minutes at any given location. While the goal of this measure is primarily to reduce public health impacts from diesel emissions, compliance with the regulation also results in energy savings in the form of reduced fuel consumption from unnecessary idling.

In addition to limiting exhaust from idling trucks, CARB also promulgated emission standards for off-road diesel construction equipment of greater than 25 horsepower such as bulldozers, loaders, backhoes and forklifts, as well as many other self-propelled off-road diesel vehicles. The In-Use Off-Road Diesel-Fueled Fleets regulation adopted by CARB on July 26, 2007, aims to reduce emissions through installation of diesel soot filters and encouragement for retiring, replacing, or repowering older, dirtier engines with newer emission-controlled models (13 CCR Section 2449). The compliance schedule requires full implementation by 2023 in all equipment for large and medium fleets and by 2028 for small fleets. While the goal of this measure is primarily to reduce public health impacts from diesel emissions, compliance with the regulation has shown an increase in energy savings in the form of reduced fuel consumption from more fuel-efficient engines.

Local Regulations and Plans

San Francisco Sustainability Plan

Adopted in 1997, the San Francisco Sustainability Plan was created as a living document to frame and inform sustainable planning. The Energy, Climate Change, and Ozone Depletion section includes several goals and actions, including maintaining an energy supply based on renewable environmentally sound resources and reducing overall power use by maximizing energy efficiency (City and County of San Francisco 1997).

San Francisco Construction and Demolition Debris Ordinance

The San Francisco Construction and Demolition Debris Ordinance (No. 27-06) was adopted in 2006 (San Francisco Department of the Environment 2006). This ordinance affects all construction projects such as new construction, remodels, tenant improvements, and full or partial demolitions, and requires the building permit holder or the property owner to make sure that all construction and demolition debris materials removed from the project are properly recycled or reused.

Construction and demolition debris materials source-separated by material type at the construction site for reuse or recycling (such as metal, wood, drywall, cardboard, concrete, etc.) must be taken to a facility that reuses or recycles those materials. The ordinance requires that all mixed construction and demolition debris must be transported off-site by a registered transporter and taken to a registered facility that processes mixed construction and demolition debris and has demonstrated to the City and County of San Francisco that it diverts a minimum of 65 percent of the material from landfill.

Evaluation of Environmental Effects:

a. Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation? **(*Less Than Significant Impact*)**

Construction activities associated with the Project would require the use of heavy-duty, off-road equipment and construction-related vehicle trips that would combust fuel, primarily gasoline and diesel. Fuel consumption associated with vehicle trips generated by the Project would not be considered inefficient, wasteful, or unnecessary (the project is required to be completed by an Order from the Regional Water Board). Only the amount of fuel needed to operate remediation equipment and construction-related vehicle trips would be utilized. Landfills that are planned to be utilized are those closest to the Project Area, where feasible. The Project would not directly use electricity for remediation-related operations other than minimal use for things like a support staff trailer.

Construction equipment fleet turnover and increasingly stringent state and federal regulations on engine efficiency, combined with state regulations limiting engine idling times, would further reduce the amount of transportation fuel demand during Project implementation. All off-road equipment could be required to comply with CCR Title 13 Section 2485, which requires off-road construction equipment operators to reduce idling of engines to less than 5 minutes and to replace or retrofit older off-road equipment fleets to meet specific particulate matter and nitrogen oxide emission standards based on fleet averages.

The remediation-related construction activities would not create long-term energy demands as there are no operational related components to the Project; thus, the City's Construction and Demolition Debris Recovery Ordinance is the energy reduction strategy that is most relevant to the Project. A waste diversion plan consistent with the City's Construction and Demolition Debris Recovery Ordinance will be developed in the Waste Management and Transportation Plan for the Project that would provide for the maximum debris diversion from landfills for recycling or reuse. The remedial plan already prioritizes recycling over disposal for the debris that would be generated. However, much of the material from the remediation project would likely be contaminated and require landfill disposal, as discussed above.

The following plans, controls, and AMMs listed in Attachment A would be implemented to reduce wasteful, inefficient, or unnecessary consumption of energy resources:

- Waste Management and Transportation Plan (e.g., estimations of daily quantity and schedule for trucks and loads per truck)
- Dust, vapor, and odor control measures (e.g., minimizing idling times)
- Transportation control measures (e.g., truck haul routes and inspection requirements)
- Sustainability Measures Implementation Plan (e.g., Strategies to optimize sustainability such as opportunities for reducing electricity and water consumption, volumes of material purchased, offsite disposal volumes, and selecting equipment of sustainable size, alternate fuels where feasible)

With implementation of these provisions, the Project would not result in wasteful, inefficient, or unnecessary consumption of energy resources. Therefore, the impact would be less than significant.

b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency? **(*No Impact*)**

The Project would remediate contaminated sediments within the Bay. It would not conflict with or obstruct a plan for renewable energy or energy efficiency. Therefore, the Project would have no impact in relation to this criterion.

References:

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7. USEPA. 2016. Federal Register/Vol. 81, No. 206/Tuesday, Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles—Phase 2, October 25. Available at: https://www.gpo.gov/fdsys/pkg/FR-2016-10-25/pdf/2016-21203.pdf. Accessed August 2020. U.S. Environmental Protection Agency.
8. San Francisco Department of Energy. 2006. Construction and Demolition Debris Recovery Requirements. San Francisco Ordinance No. 27-06. Available at: https://sfenvironment.org/sites/default/files/fliers/files/cd_ordinance.pdf
9. San Francisco Planning Department. 2018a. General Plan – Recreation and Open Space Element. Available at: https://generalplan.sfplanning.org/Recreation_OpenSpace_Element_ADOPTED.pdf.
10. San Francisco Planning Department. 2018b. General Plan – Transportation Element. Available at: https://generalplan.sfplanning.org/I4_Transportation.htm.
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5.7 Geology and Soils

Would the project:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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 water?	☐	☐	☐	☒
f. Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?	☐	☐	☐	☒

Project Activities Likely to Create an Effect:

- In-water construction activities (e.g., debris removal, dredging, pile driving/removal, capping/armor placement, and slope stabilization)
- Material handling and staging on uplands

Existing Environmental Conditions:

The Project Area includes the intertidal and subtidal area between Pier 39 and Pier 43½ along the margin of the Bay in San Francisco. The Project would also involve an MHF, either at Pier 96 in San Francisco or at Berth 10 in Oakland (Figure 2-1). Piers 39 through 43½ extend into the Bay north of The Embarcadero, a major road oriented east-west to the south of the Project Area, approximately between Taylor Street and Kearny Street. The seawall, which extends east-west along the entire Project Area and is located bayward of the historical natural shoreline that existed before filling of the Bay, serves as the southern boundary of the Project Area. The bayward limits extend approximately 1,000 feet offshore.

The geologic setting of the Project Area has been heavily influenced by filling and development of the seawall (Haley & Aldrich 2020). The modern shoreline was created by filling the shallow tidal mudflats between 1880 and 1910. The seawall was designed as a 40-foot-high, 100-foot-wide rock embankment with naturally sloping sides, rising from a 20-foot-deep trench. Development of the seawall began in 1878 and concluded in 1899, and filling behind the seawall was completed by 1913. The seawall revetment consists of debris and riprap. The seawall remains in place to this day.

The Project Area sediments are dominantly silt with varying amounts of sand and clay, consistent with the ubiquitous bay mud found throughout the Bay (Haley & Aldrich 2020). The sediment at the mudline is soft and has a high percentage of water content. The sediment becomes more consolidated with depth (approximately 2 to 3 feet below mudline), and porosity and permeability generally decrease with depth (Haley & Aldrich 2020). A 2017 bathymetry survey documented considerable debris in the former Pier 43 footprint attributed to demolition (Haley & Aldrich 2020).

Pier 96 is composed of asphalt/concrete-covered land with pile-supported concrete berthing sufficient for a barge. Berth 10 is located in the northwestern corner of the Port of Oakland near the foot of the San Francisco-Oakland Bay Bridge. About half of Berth 10 is constructed on a pile-supported concrete wharf and the remaining half is on asphalt-covered land.

Regulatory Framework:

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 (Public Resources Code, Chapter 7.8, Division 2, Sections 2690–2699) directs the California Department of Conservation, Division of Mines and Geology (now called the California Geological Survey [CGS]) to delineate Seismic Hazard Zones. The purpose of the Seismic Hazards Mapping Act is to reduce the threat to public health and safety and to minimize the loss of life and property by identifying and mitigating seismic hazards. Cities, counties, and state agencies are directed to use seismic hazard zone maps developed by CGS in their land use planning and permitting processes. The Seismic Hazards Mapping Act requires that site-specific geotechnical investigations be performed prior to permitting most urban development projects within seismic hazard zones. The upland portion of the Project Area (with the exception of the overwater structures such as Pier 39) is within a liquefaction hazard zone as designated on a map prepared by CGS (CGS 2000).

Port of San Francisco Building Code

Building permits for work on Port property must comply with the Port of San Francisco Building Code, Section 106A.1.7 (Port of San Francisco 2019). The building permit application includes requirements for tenant impact assessment, community outreach, engineering design plans, construction staging area (noise, dust, and debris mitigation), traffic mitigation, work commencement notification, any applicable utility services disruption notifications, and project overview and schedule. The building permit application also includes a checklist of applicable environmental regulatory requirements and resources, including those related to CEQA, the Maher Ordinance, stormwater, construction in water bodies or near the Bay, green building and clean construction, air quality, and hazardous materials.

Evaluation of Environmental Effects:

a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42? *(No Impact)*

The Project Area and the MHF sites are not traversed by any active faults as defined on the Alquist-Priolo Earthquake Fault Zoning Map (CGS 2018; CGS 2020). Therefore, the Project would not cause potential substantial adverse effects involving rupture of a known earthquake fault.

ii) Strong seismic ground shaking? *(Less Than Significant Impact)*

The Project Area and the MHF sites are located in a region of California with a high degree of seismic activity (CGS 2018; CGS 2020). Like the rest of the Bay Area, the Project Area would be subject to ground shaking in the event of an earthquake on one of the regional faults. The intensity of the seismic shaking, or strong ground motion, at the Project Area is dependent on the distance between the Project Area and the epicenter of the earthquake, the magnitude of the earthquake, and the geologic conditions underlying and surrounding the Project Area. Earthquakes occurring on faults closest to the Project Area would most likely generate the largest ground motions. The U.S. Geological Survey estimates that it is nearly certain that a moment magnitude 6.7 or higher earthquake will occur on one of the California regional faults in the 30-year period between 2014 and 2044, with a 72 percent likelihood in the San Francisco Region (Field, E.H., and 2014 Working Group on California Earthquake Probabilities, 2015). The U.S. Geological Survey considers the Hayward-Rodgers Creek and Calaveras faults to be particularly ready to rupture.

Pile placement or replacement is the only Project activity that could have an impact related to ground shaking because impact pile driving would cause vibrations temporarily. Outside of immediate contact between pile and sediment, long-term impacts are not anticipated based on installation methods and prior pile installation at the site. Sound monitoring will be conducting during installation for environmental impacts and vibration surveys may be conducted as well, pending recommendations based on data from the geotechnical investigations.

The pile replacements would be constructed in accordance with the most current Port of San Francisco Building Code, which incorporates California Building Code requirements, to ensure that the new piles would remain substantially sound in the event of an earthquake and would not pose a threat to nearby people or structures. A Port of San Francisco building permit would be required for temporary construction facilities, including the MHF that may be located at the Port's Pier 96, and for staging areas, likely located at Pier 94. The Port engineers would also review Project design documents for adherence to Port building standards, as applicable. The Port of San Francisco Building Code requirements would be supplemented by other accepted seismic design standards including American Society of Civil Engineers Seismic Design of Pile Supported Piers and Wharves (ASCE/COPRI 61-14). During review of the building permit for the Project, the Chief Harbor Engineer, in consultation with the Port, would determine necessary engineering and design features to reduce potential damage from ground shaking. This determination would ensure compliance with all Port of San Francisco Building Code provisions regarding structural safety.

Replacement of piles and compliance with Port of San Francisco Building Code requirements and supplemental standards (subject to review by the Chief Harbor Engineer) would ensure that the structures supported by piles would remain substantially sound in the event of an earthquake and would not pose a threat to nearby people or structures. Further, the Project would not affect the magnitude of earthquakes on any of the regional faults, nor alter the nature of any of the native geologic materials making them more susceptible to ground shaking.

The Project itself would not exacerbate ground shaking because of the short time period of construction and the nature of the construction activities. The Project would also not expose people or structures to substantial adverse effects related to ground shaking because the Project would not generate new, permanent structures or increase the number of people in the Project Area who could be exposed to strong seismic ground shaking. Therefore, the Project's impact related to strong seismic ground shaking would be less than significant.

iii) Seismic-related ground failure, including liquefaction? *(No Impact)*

Liquefaction is a secondary effect of amplified ground shaking in unconsolidated, cohesionless sediments, such as silts and sands. Liquefaction occurs when saturated, cohesionless soils become "liquid" due to ground shaking. The Project Area is completely in the water and not in a liquefaction hazard zone. However, as discussed above, the upland areas adjacent to Piers 39 to 43½, Pier 96, and Berth 10 are all located within a liquefaction hazard zone (CGS 2000; CGS 2018; CGS 2020).The Project would not involve the construction of permanent structures within the liquefaction zone. Therefore, the Project not cause seismic-related ground failure, including liquefaction.

iv) Landslides? *(No Impact)*

The Project Area and the MHF sites and surrounding areas are relatively level and would not be subject to landslides (Ellen et al. 1997; CGS 2000; CGS 2020). Therefore, the Project would not cause potential substantial adverse effects involving to landslides.

b. Result in substantial soil erosion or the loss of topsoil? **(*No Impact*)**

The Project would enhance the existing shoreline erosion protection and reduce erosion by placement of riprap within the existing shoreline revetment area where visual observation indicates riprap cover is missing, and placement of a strip of armor between the dredged area and existing shoreline riprap area as erosion protection in the shoreline zone. The surface of the materials management and handling areas of the Project Area and MHF sites is paved or graveled, and therefore erosion or topsoil loss is not expected to occur in the MHF or staging areas. There are no activities or construction planned for the Project that would result in soil erosion or loss of topsoil. Therefore, the Project would not result in substantial soil erosion or the loss of topsoil.

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

Given the low strength of the fine-grained sediments in the submerged portion Project Area, dredging of soft sediments may result in localized underwater slope failures that may be difficult to control once movement begins. Based on pre-design investigations, field observations, and preliminary geotechnical evaluations completed in support of remedy design, slope stabilization would be necessary in certain areas of the Project. Soil pinning would be used to promote slope stability, where required pending further design evaluations. Up to 1,200 piles, 12 inches in diameter, would be embedded below the post-dredge surface, to a depth of 50 feet, across the face of select areas of the slopes in all remedial response areas. The piles would be driven such that the butt (or top) of the pile would be embedded below the post-dredge surface before being covered with cap materials and armor stone, where the top of the pile would reside 3 to 4 feet below the finished elevation of the restored bay floor.

The Project would adhere to the geotechnical engineer recommendations for slope stability, which would ensure that the Project would not result in significant impacts related to unstable soil (Haley & Aldrich 2021). As described above, the Project includes adding erosion protection measures in the shoreline zone (also required as part of the Port of San Francisco building permit for temporary construction of the MHF at Pier 96, as listed in Table 4-5), which would mitigate any impacts from unstable soil. There are no activities or construction planned for the Project in the MHF that would result in unstable soil. Any activities that would potentially destabilize soft sediments would adhere to geotechnical engineering recommendations for slope stability. The Geotechnical Instrumentation and Monitoring Plan, as described in Attachment A, would be implemented to monitor the impact of construction on ground vibrations and movement of structures along the shoreline; thus, the impact on soil stability would be less than significant.

d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property? **(*No Impact*)**

The Project consists of remediation of offshore sediments and no construction of any structures, including at the MHF, that could be affected by expansive soils or exacerbate expansive soil conditions. Therefore, the Project would have no impact related to expansive soils that would create risks to life or property.

e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of water? **(*No Impact*)**

The Project consists of remediation of sediment in the Bay. The Project would not include use of septic tanks. Portable toilets and hand washing stations would be used on a temporary basis during Project construction.

Decant water generated during sediment dewatering would be collected, stored, and, as required, treated by a temporary wastewater treatment system established at the MHF on a paved area and discharged either to the Bay or a sanitary sewer under a permit. See Section 5.10 for a more detailed discussion of water quality.

No Project activities would affect soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems. Therefore, the Project would have no impact on soils incapable of supporting waste water systems.

f. Directly or indirectly destroy a unique paleontological resource or site or unique geological feature? (***No Impact***)

Artificial fills and soils have little or no potential to contain paleontological resources. Although plant and invertebrate fossil remnants have been found in the bay mud, these fossils occur abundantly and would not be noteworthy. The artificial fill, debris, and sediment in the Project Area are considered to have low paleontological potential. Alta Archaeological Consulting (2020) completed a cultural resources assessment for the Project and concluded that the area does not have the potential for submerged prehistoric archaeological resources because dredging would occur in recent sediments that have been previously disturbed (see Section 5.5). The same line of evidence can be applied to paleontological resources, which are still older than archaeological resources and thus unlikely to be found in disturbed sediments.

The Project Area and MHFs are located along the Bay waterfront, which is flat, and in areas of previously disturbed artificial fill with little or no potential to contain paleontological resources and no unique geologic features. Therefore, the Project would have no impact on unique paleontological resources or geologic features.

References:

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5.8 Greenhouse Gas Emissions

Would the project:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Project Activities Likely to Create an Effect:

- In-water construction and activities (e.g., debris removal, dredging, pile driving/removal, capping/armor placement, and slope stabilization)
- Barge transport of materials and transport of workers
- Trucking/transportation of dredged material and debris to landfills and other disposal facilities
- Import of materials to Project Area
- Material handling

Existing Environmental Conditions:

Gases that trap heat in the atmosphere are called greenhouse gases (GHGs). The process of heat being trapped in the atmosphere is similar to the effect greenhouses have in raising the internal temperature, hence the name "greenhouse gas." Both natural processes and human activities emit GHGs. The accumulation of GHGs in the atmosphere regulates the Earth's temperature; however, emissions from human activities—such as fossil fuel-based electricity production and the use of motor vehicles—have elevated the concentration of GHGs in the atmosphere. GHGs are not monitored in the same manner as air quality pollutants, so there are no background data to characterize the baseline conditions of a given area in terms of GHG levels.

GHGs from fossil fuel combustion include CO_2, methane (CH_4), and nitrous oxide. CO_2 is the most common reference gas for climate change. To account for warming potential, GHGs are often quantified and reported as CO_2 equivalents (CO_2eq), based on their warming potential relative to CO_2.

The San Francisco Department of Environment estimated that the city's 2019 community-wide GHG emissions, or carbon footprint, totaled 4.6 million metric tons CO_2eq (SFDE 2021). The city's largest source of GHG emission (47 percent based on a 2019 inventory) is transportation, which comprises cars and trucks, maritime ships and boats, and off-road public transportation.

Regulatory Framework:

California Global Warming Solutions Act

In 2006, the California legislature passed the California Global Warming Solutions Act (SFDE 2018). Assembly Bill (AB) 32 requires CARB to design and implement emission limits, regulations, and other measures, such that feasible and cost-effective statewide GHG emissions are reduced to 1990 levels by 2020 (representing a 25 percent reduction from forecast emission levels).

One specific requirement of AB 32 is to prepare a “scoping plan” for achieving the maximum technologically feasible and cost-effective GHG emission reductions by 2020. The initial Scoping Plan was approved in 2008, as required by AB 32, and reapproved in 2011. The initial Scoping Plan contained a mix of recommended strategies that combined direct regulations, market-based approaches, voluntary measures, policies, and other emission reduction programs calculated to meet the 2020 statewide GHG emission limit and initiate the transformations needed to achieve the state’s long-range climate objectives.

The Scoping Plan is the state’s overarching plan for addressing climate change. In order to meet these goals, California must reduce its GHG emissions by 30 percent below projected 2020 business-as-usual emission levels or about 15 percent from 2008 levels.

The First Update to the Scoping Plan was approved by CARB on May 22, 2014, and builds upon the initial Scoping Plan with new strategies and recommendations. The First Update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. The First Update defines CARB’s climate change priorities for the next 5 years and also sets the groundwork to reach long-term goals. The First Update highlights California’s progress toward meeting the “near- term” 2020 GHG emission reduction goals defined in the initial Scoping Plan. It also evaluates how to align the state's “longer-term” GHG reduction strategies with other state policy priorities for water, waste, natural resources, clean energy, transportation, and land use.

Clean Air Plan/Regional Climate Protection Strategy

The current BAAQMD air quality planning document is the 2017 Clean Air Plan/Regional Climate Protection Strategy, titled Spare the Air-Cool the Climate, which addresses air quality improvement and GHG reduction for the nine-county Bay Area region. Adopted on April 19, 2017, the 2017 Clean Air Plan contains control measures to be implemented with the goal to reduce emissions from specific sources (BAAQMD 2017). Control measures in the 2017 Clean Air Plan include land use and local impact, and energy and climate measures to reduce emissions of GHGs.

San Francisco Greenhouse Gas Reduction Strategy

The City and County of San Francisco has developed a number of plans and programs to reduce the city’s contribution to global climate change. Collectively known as the City’s Greenhouse Gas Reduction Strategy (SF Planning Department 2017), the compilation of policies, programs and regulations adopted by the City was found to be consistent with and to achieve reductions exceeding the state’s AB 32 goals (BAAQMD 2010).

The Greenhouse Gas Reduction Strategy documents the City and County of San Francisco’s actions to pursue cleaner energy, energy conservation, alternative transportation, and solid waste policies. As identified in the Greenhouse Gas Reduction Strategy, the City and County of San Francisco have implemented a number of requirements and incentives that have measurably reduced GHG emissions, including but not limited to increasing the energy efficiency of new and existing buildings; installing solar panels on building roofs; implementing a green building strategy; adopting a zero waste strategy, a construction and demolition debris recovery ordinance, a solar energy generation subsidy, and a recycling and composting ordinance; and incorporating alternative fuel vehicles in the city's transportation fleet (including buses).

San Francisco Construction and Demolition Debris Ordinance

The San Francisco Construction and Demolition Debris Ordinance (No. 27-06) was adopted in 2006 (SFDE 2006). This ordinance affects all construction projects such as new construction, remodels, tenant improvements, and full or partial demolitions, and requires the building permit holder or the property owner to make sure that all construction and demolition debris materials removed from the project are properly recycled or reused.

Construction and demolition debris materials source-separated by material type at the construction site for reuse or recycling (such as metal, wood, drywall, cardboard, concrete, etc.) must be taken to a facility that reuses or recycles those materials. The Ordinance requires that all mixed construction and demolition debris must be transported off-site by a registered transporter and taken to a registered facility that processes mixed construction and demolition debris and has demonstrated to the City and County of San Francisco that it diverts a minimum of 65 percent of the material from landfill.

Thresholds for Construction GHG Emissions

BAAQMD has not developed construction GHG thresholds as there is not sufficient evidence to determine a level at which construction emissions are significant (BAAQMD 2009). BAAQMD recommends a case-by-case consideration of construction GHG emissions and encourages project applicants to implement construction GHG reduction strategies, where feasible.

Evaluation of Environmental Effects:

a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? **(*Less Than Significant Impact*)**

The GHG emissions from the Project were estimated based on information obtained from the design engineers (Haley & Aldrich) and using CalEEMod. Project-specific inputs to CalEEMod include Project land use types; size in acres and square feet; start and end dates of construction phases; heavy-duty equipment types and operating hours; volumes of structures to be demolished; and haul, material, and worker trips. GHG emissions from marine harbor craft equipment were estimated using CARB's methodology and emission factors (CARB 2004). The assumptions used in this analysis are based on planning-level information; actual equipment types and numbers, worker trips, and other aspects of construction would be determined by the contractor. The assumptions and resulting emission estimates provided herein are likely conservative (i.e., overestimates).

Remedial work could be expedited, with some remedial response areas combined within a single construction season or year; areas other than Area E could be spread over more than 1 year. The maximum activities that could be done in a single year can be represented by combining Areas B and C into a single year or construction season. For the purpose of providing conservative estimates, GHG emissions were estimated for the combination of the following areas/scenarios: Areas A and C, Areas B and C, Areas B and D, and Area E. This scenario would represent the maximum GHG emissions if remedial work were expedited in any of the remedial areas. This approach provides an assessment of upper-bound emissions.

The detailed calculations are included in Attachment B and the results are summarized in Table 5--8.1. Table 5-8.1 presents the GHG emissions that would be emitted during a single year, except for Area E which could take up to 2 years. The City and County of San Francisco's 2019 community-wide GHG emissions (the most recent inventory available) were estimated at 4,640,675 metric tons CO_2eq (SF Gov 2021). Therefore, it would be reasonable to conclude that the maximum emissions from the Project would be about 0.20 percent of the community-wide emissions.

Table 5-8.1. Project Construction GHG Emissions by Remedial Response Area

Remedial Response Areas	GHG CO_2eq (metric tons/year)	% of 2019 Community-wide GHG Emissions
Landside Emissions		
Area A and B	404	0.008
Area B and C	484	0.009
Area B and D	154	0.003
Area E - Year 1	621	0.012
Area E - Year 2	629	0.012
Marine Emissions		
Area A and B	1,084	0.021
Area B and C	1,426	0.028
Area B and D	1,093	0.021
Area E - Year 1	1,614	0.031
Area E - Year 2	1,614	0.031
Project Total	**9,123**	**0.20**

Maximum GHG emissions estimated for the combination of areas, as shown in Table 5-8.1 above, would only account for 0.20 percent in total compared to the City and County of San Francisco's 2019 community-wide GHG emissions. In addition, the Projects GHG emissions would only be temporary. The Project would be consistent with the City's Construction and Demolition Debris Recovery Ordinance, discussed in more detail below, which is one of the City's strategies to reduce GHG emission through the reuse of building materials whose manufacture results in emissions of GHGs, therefore the Projects GHG emissions would have a less than significant impact on the environment.

b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? **(*Less Than Significant Impact*)**

GHG reduction plans applicable to the Project include the AB 32 Scoping Plan, BAAQMD's 2017 Clean Air Plan, and the City and County of San Francisco Greenhouse Gas Reduction Strategy, which are intended to reduce GHG emissions below current levels.

The remediation-related construction activities would not include long-term energy demands; thus, the City's Construction and Demolition Debris Recovery Ordinance is the GHG reduction strategy that is most relevant to the Project. A waste diversion plan consistent with the City's Construction and Demolition Debris Recovery Ordinance would be developed in the Waste Management and Transportation Plan for the Project that would provide for diverting a minimum of 65 percent of construction and demolition debris from landfills for recycling or reuse[3] (San Francisco Department of the Environment 2006). Through this plan, GHG emissions could be reduced through the reuse of materials, the manufacture of which results in emissions of GHGs. However, much of the material from the remediation project would likely be contaminated and would require landfill disposal. Furthermore, all off-road equipment could be required to comply with 13 CCR, which requires off-road construction equipment operators to reduce idling of engines to less than 5 minutes and to

[3] Construction and demolition debris includes building materials and solid waste generated from construction and demolition activities including, but not limited to, asphalt, concrete, brick, rock, soil, lumber, gypsum wallboard, cardboard and other associated packaging, roofing material, ceramic tile, carpeting, fixtures, plastic pipe, metals, tree stumps, and other vegetative matter resulting from land clearing.

replace or retrofit older off-road equipment fleets to meet specific particulate matter and nitrogen oxide emission standards based on fleet averages. These requirements reduce CO_2, CH_4, NO_2, and black carbon emissions from construction equipment. Implementation of a waste reduction plan for construction-related activities would not conflict with any plan, policy, or regulation.

In addition, the following plans, controls, and AMMs, which are further described in Attachment A, would be implemented to reduce the emissions of GHGs:

- Waste Management and Transportation Plan (e.g., methods to safely and efficiently manage offsite disposal of sediments and other waste materials)
- Sustainability Measures Implementation Plan (e.g., reducing electricity and water consumption, volumes of materials purchased, offsite disposal volumes, selecting equipment of sustainable size, alternative fuels)
- Dust, vapor, and odor control measures (e.g., idling times, maintenance of construction equipment)
- Transportation control measures (e.g., vehicles for waste transport will be properly maintained, registered and operated).

With implementation of these plans, controls, and AMMs, GHG emissions would be minimized and would not conflict with an applicable plan, policy or regulation; thus the impact would be less than significant.

References:

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5.9 Hazards and Hazardous Materials

Would the project:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Create a significant hazard to the public or the environment throughout the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒

Project Activities Likely to Create an Effect:

- In-water construction activities (e.g., debris removal, dredging, pile driving/removal, and capping/armor placement)
- Material handling
- Offsite transport and disposal of excavated sediment and debris.

Existing Environmental Conditions:

Elevated PAH concentrations, likely resulting from the historical MGP and other industrial operations in the area, are present in surface and subsurface sediments of the Project Area. PAHs at concentrations exceeding the RAL exist in surface and/or shallow subsurface (0 to 3 feet below the surface) sediments within the Project Area (Haley & Aldrich 2020). Some of the 226 wood pilings present in the Project Area are creosote-treated. Creosote is an additional source of PAHs to the sediment and water column, in addition to the historic activities of the MGP.

The uplands adjacent to the Project Area are zoned commercial and there is a high concentration of visitor-related commercial development including Bay scenic cruise boats and ferry terminals and their supporting infrastructure. The Pier 96 terminal is zoned for heavy industry. In Oakland, Berth 10 is zoned “Industrial General.” The MHFs are both in areas of industrial and maritime use, including material and container handling, warehouses, tug services, and ship loading operations. There are no sensitive land uses (e.g., hospitals, schools, daycares, nursing homes) within ¼ mile of the Project Area; no residences are adjacent, but there are hotels and apartment buildings within three blocks. The closest residential properties to Pier 96 are about 0.5 mile to the southwest and the closest school is 0.7 mile away. The nearest residential properties to Berth 10 are about 0.7 mile to the southeast and there are no daycares, schools, or nursing homes within a 1-mile radius.

As discussed in Section 5.3, ambient concentrations of criteria pollutants in air are monitored in the SF Air Basin by the BAAQMD. The San Francisco station, located at 10 Arkansas Street, is the closest to the Project Area and the only station in San Francisco County. Table 5-3.1 includes a summary of the maximum concentrations and the number of occurrences of exceedances of the state and national ambient air quality standards for the 3-year period from 2017 through 2019 It shows the following exceedances: the 1-hour ozone (O_3) state standard was exceeded 14 times and the 8-hour O_3 state and national standards were exceeded 17 and 9 times, respectively; the national 1-hour NO_2 standard was exceeded once; the state and national 24-hour standards for respirable particulate matter with a diameter less than 10 microns (PM_{10}) were exceeded 17 times and 1 time, respectively; and the 24-hour national standard for fine particulate matter with a diameter less than 2.5 microns ($PM_{2.5}$) was exceeded 37 times.

Regulatory Framework

Federal Regulations

The **Resource Conservation and Recovery Act of 1976 (RCRA)** creates the framework for the proper management of hazardous and non-hazardous solid waste, such as the debris and dredged sediments that would be removed from the Project Area.

The **CWA** requires the State of California to adopt and enforce water quality standards to protect the Bay and also addresses discharges of hazardous substances as well as the prevention discharges of oil. As established through the Porter-Cologne Water Quality Control Act, the State Water Resources Control Board shares responsibility with the Regional Water Board for implementation of the CWA’s provisions as they relate to water quality in the Bay.

The federal **Clean Air Act** requires CARB, based on air quality monitoring data, to designate portions of the state where the national ambient air quality standards are not met as “nonattainment areas.” Because of the differences between the national and state ambient air quality standards, the designation of nonattainment areas is different under the federal and state legislation. Areas that meet the air quality standards are considered to be in attainment of the standards. Areas where there are no monitoring data available or insufficient data to classify the area are considered unclassified and for regulatory purposes are treated as attainment areas.

Worker health and safety are regulated at the federal level by the Occupational Safety and Health Administration (OSHA). The **Federal Occupational Safety and Health Act of 1970** authorizes states to establish their own safety and health programs with OSHA approval. Workers at hazardous waste sites (or workers who may be exposed to hazardous wastes that might be encountered during excavation of contaminated soils) must receive specialized training and medical supervision according to the Hazardous Waste Operations and Emergency Response regulations. Additional regulations have been developed for construction workers potentially exposed to lead and asbestos.

The **MPRSA** is administered by the EPA, and the USACE manages permits authorizing the ocean disposal of dredged materials. There are specific testing requirements to determine whether dredge material is suitable for unconfined aquatic disposal at SF-DODS. USACE must obtain EPA concurrence and incorporation of EPA's ocean disposal conditions prior to issuance of ocean disposal permits under Section 103 of the MPRSA. The potential for the project to obtain an MPRSA permit for offshore ocean disposal is uncertain as the quantity of material eligible for SF-DODS is potentially low.

State Regulations

California hazardous materials regulations are contained in **Title 22 CCR.** DTSC is authorized by EPA to enforce and implement federal hazardous materials laws and regulations. California regulations pertaining to hazardous materials are equal to or exceed the federal regulation requirements. DTSC generally acts as the lead agency for upland soil and groundwater cleanup projects that affect public health, and establishes cleanup levels for subsurface contamination that are equal to, or more restrictive than, federal levels. DTSC has also developed land disposal restrictions and treatment standards for hazardous waste disposal in California, including for treated wood products such as the pilings that may be removed from the Project Area. On August 31, 2021, Governor Newsom signed Assembly Bill AB332 and the bill takes effect immediately.[4] AB332 adopts new Alternative Management Standards (AMS) for treated wood waste that are codified in Health and Safety Code section 25230. As a result of the chaptering of the bill, variances are no longer necessary because they have been replaced by the AMS. The new AMS are similar to the rules that applied under the variance program, except that no variance is required (DTSC 2021).

Under the **Porter-Cologne Water Quality Control Act** (California Water Code, Division 7), the State Water Resources Control Board has authority over state waters and water quality. "Waters of the state" are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (Water Code Section 13050[e]). The Regional Water Board has authority in the Bay region, including the Project Area. The Regional Water Board prepares and periodically updates the Water Quality Control Plans (Basin Plans), which establish:

- Beneficial uses of water designated for each protected water body
- Water quality standards for both surface water and groundwater
- Actions necessary to maintain these water quality standards.

Projects that will discharge waste to waters of the state must file a report of waste discharge with the appropriate Regional Board, if the discharge could affect the quality of waters of the state (Article 4, Section 13260). The Regional Water Boards is responsible for issuing waste discharge requirements (WDRs) or a waiver of the WDRs for a project. The requirements will implement any relevant water

[4] https://dtsc.ca.gov/toxics-in-products/treated-wood-waste/

quality control plans that have been adopted, and must take into consideration the beneficial uses to be protected and the water quality objectives reasonably required for that purpose (Article 4, Section 13263).

Title 8 CCR contains the state's standards for workers dealing with hazardous materials and includes practices for all industries (General Industrial Safety Orders), along with specific practices for construction and other industries. Worker health and safety protections in California are regulated by the California Department of Industrial Relations, which includes the Division of Occupational Safety and Health (Cal/OSHA), which acts to protect workers from safety hazards and provides consultant assistance to employers. Cal/OSHA enforcement units conduct onsite evaluations and issue notices of violation to enforce necessary improvements to health and safety practices.

The California Department of Resources Recycling and Recovery (CalRecycle) is a department within the California Environmental Protection Agency. CalRecycle administers and provides oversight for all of California's state-managed non-hazardous waste handling and recycling programs. Title 14 CCR includes regulations related to non-hazardous waste management in California, and Title 27 includes regulations for waste disposal on land.

CARB implemented the Diesel Risk Reduction Plan to significantly reduce diesel PM emissions. The Diesel Risk Reduction Plan requires all new diesel-fueled vehicles and engines to use state of the art catalyzed diesel particulate filters and very low-sulfur diesel fuel (CARB 2004). Further, all existing vehicles and engines should be evaluated, and wherever technically feasible and cost effective, retrofitted with diesel particulate filters (CARB 2004).

Regional and Local Regulations

The **2017 Clean Air Plan** is implemented by BAAQMD (2017a). The plan provides a regional strategy to protect public health and protect the climate. To protect public health, the plan describes how BAAQMD will continue making progress toward attaining all state and federal air quality standards and eliminating health risk disparities from exposure to air pollution among Bay Area communities. The 2017 Clean Air Plan includes a wide range of control measures designed to decrease emissions of the air pollutants that are most harmful, such as particulate matter, O_3, and toxic air contaminants; and to decrease emissions of carbon dioxide by reducing fossil fuel combustion. The 2017 Clean Air Plan represents the Bay Area's most recent assessment of the region's strategy to attain the state and national O_3 and $PM_{2.5}$ standards.

The **San Francisco Bay DMMO** evaluates dredge material suitability for beneficial reuse. The DMMO comprises the following agencies: USACE, EPA, Regional Water Board, BCDC, and CDFW. Beneficial reuse acceptance criteria for sediment are established in the Draft Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines (Regional Water Board 2000). Any disposal to SF-DODs requires concurrence from EPA.

The **San Francisco Department of Public Health** (SFDPH) is the primary agency responsible for local enforcement of state and federal laws pertaining to hazardous materials and hazardous waste management. In San Francisco, SFDPH is the Certified Unified Program Agency, responsible for coordination of the following programs: Hazardous Materials Business Plan Program, Hazardous Waste Generator Program, Aboveground and Underground Storage Tank Programs, California Accidental Release Program, and Tiered Permitting Program. SFDPH also provides regulatory oversight for investigation and cleanup of leaking underground fuel tank sites.

San Francisco Health Code Article 22A (Maher Ordinance) requires SFDPH oversight for the characterization and mitigation of hazardous substances in soil and groundwater in designated areas zoned for industrial uses, sites with industrial uses or underground storage tanks, sites with historic Bay fill, and sites in close proximity to freeways or underground storage tanks. Portions of the Project Area are within designated shoreline areas, but none of the proposed remedial project work falls under the Maher Ordinance. San Francisco Health Code Article 22B (Air Quality/Dust) requires

SFDPH review of dust control plans if the project includes demolition or construction in an area greater than half an acre with sensitive receptors within 1,000 feet (residence, school, childcare center, hospital or other health-care facility or group living quarters). If the project size is less than half an acre or there is no sensitive use nearby, SFDPH may issue a waiver that specifies that the project is not required to have a site-specific dust control plan. However, even projects not requiring a site-specific dust control plan must ensure contractors understanding of the San Francisco Clean Construction Ordinance No. 28-15 and City and County of San Francisco regulations that apply to air quality. Enforcement is provided by the agency that issues the permit for the work (which, in the case of the Project, would be the Port of San Francisco).

Evaluation of Environmental Effects:

a. Create a significant hazard to the public or the environment throughout the routine transport, use, or disposal of hazardous materials? **(*Less Than Significant Impact*)**

Implementation of the Project would result in removal of PAH-contaminated sediments and debris from the Project Area, which would reduce the hazardous materials currently present in the Project Area. It is expected that most of the dredged sediment and debris would be classified as non-hazardous, but there is the potential for some to be classified as hazardous waste. All waste would be handled and transported properly to minimize releases to the environment and properly disposed of following state and federal regulations. The waste would be handled at the MHF at Pier 96 or at Pier 10, an area that is inaccessible to the public.

Sediment, debris, and other materials would be segregated by type and waste classification at the MHF. Sediment to be disposed at an upland landfill would be dried to remove free water by gravity and, as necessary; Portland cement or similar material could be added to facilitate drying. Decant and dewatering effluent (i.e., water) would be collected, tested, treated (if necessary), and disposed of under permit by discharge to the sanitary sewer, Bay, and/or transported and disposed of offsite. Debris and other materials would be recycled if possible or disposed of at an appropriate landfill. During transport to landfills, waste materials would be carried in covered trucks to minimize the mobilization of contaminated dust.

The following procedures (as summarized from Haley & Aldrich 2021) would be followed to ensure proper and safe handling, transport, and disposal of the removed sediment:

- Following offloading of sediment from barges to the upland, sediment would be transported to a dewatering pad at the MHF. The sediment would be placed within segmented cells constructed of prefabricated concrete blocks and allowed to gravity drain for five days. Dust generation during dewatering is expected to be minimal as the sediment will have a high moisture content throughout the process. Additional details will be provided in the Sediment Processing and Construction Water Management Plan.
- Any waste to be transported and disposed would be characterized prior to disposal or transport. Results of this assessment would be used to discuss waste acceptance and disposal options with waste disposal facilities and/or for beneficial reuse. Analytical results would be compared to the applicable waste classification thresholds to categorize material as non-hazardous waste, non-RCRA hazardous waste (i.e., California hazardous waste), or RCRA hazardous waste. Based on the work completed to date, including the characterization of investigation-derived waste, it is anticipated that the material would primarily be classified as non-hazardous waste.
- Once the waste has been characterized, a profile established, and preparations for transportation and disposal are complete, the dewatered sediment and other waste would be loaded into trucks and transported to landfills that are appropriately permitted to accept the waste and have available capacity. It is estimated that the materials to be hauled off would be classified as non-hazardous and disposed of at a Class II permitted landfill with adequate capacity (e.g., Keller Canyon in Contra Costa County). If hazardous waste is

encountered, it would be disposed of at a permitted hazardous waste landfill with adequate capacity (e.g., Kettleman Hills, Buttonwillow).

- Truck beds would be watertight and sift-proof and meet USDOT standards (as applicable). If necessary to prevent material from adhering to or loss from truck beds, truck containers may be lined with 6-mm polyethylene, built-in liner or coating, configured with sealed tailgate, or similarly protected. Trucks will be covered with a soft pull-tarp cover or similar for off-site transport. The tarp would extend over the side of the truck or rail container and will be secured in accordance with USDOT and California Highway Patrol standards.
- A Waste Management and Transportation Plan, as described in Attachment A, would be developed to provide specific approaches for managing materials in a way that reduces impacts on human health and the environment and minimizes impacts on local traffic, business, and residents near the Project Area and along designated haul routes. The plan would be prepared in accordance with DTSC guidance, and transportation routes to the selected MHF and disposal facilities would be refined in the plan.
- Material being transported from the MHF would be wetted before being loaded onto trucks to reduce the potential for dust generation during loading and transportation activities. Each truck would be inspected after filling to ensure that the affected soil/material is securely covered and that the tires and haul trucks are free of accumulated contaminated soil before they leave the MHF. Trucks would not stage on public streets.

Hazardous materials that would be present periodically during the remedial activities include fuels and lubricants, and will be handled in accordance with standard in-water equipment and construction practices. Transportation of fuel and lubricants would conform to state and federal requirements for hazardous materials transportation. Compliance with the Spill Control Plan to be developed for the Project would minimize incidental spills or leaks of fuel or lubricants, and would thus prevent public exposure.

A limited quantity of dredge material from Area E may be characterized to determine suitability for placement at a beneficial reuse site or for disposal at SF-DODS. There are currently two beneficial reuse sites permitted to receive dredge material: the Montezuma Wetlands Restoration Project and the Cullinan Ranch Restoration Project. In addition, there are four beneficial reuse sites that are expected to be permitted to receive dredge material within the next few years (Figure 4-9). Any material that would be suitable for disposal at SF-DODS or at beneficial reuse sites would be subject to site-specific screening values and waste discharge permit requirements (Regional Water Board 2000).

Approximately 226 wood piles within Area E would need to be temporarily removed to facilitate remediation and either reinstalled or replaced after dredging is completed and before or during cap placement. Any creosote-treated piles, as well as any pile that could not be reused due to damage upon removal, would be disposed of at an appropriate licensed landfill.

Any piles removed would be replaced likely using the same pile size; replaced piled could be wood, concrete, composite or steel. Replacement pile materials would be determined during the remedial design process. If treated wood is used to replace piles, material will be chosen as consistent with applicable guidance includes, but is not limited to the following:

- California Coastal Commission (2019) guidelines, which recommend that if using treated wood, “a type of preservative should be selected that minimizes the risk of aquatic and sediment toxicity.” This commonly includes treatment such as ammoniacal copper zinc arsenate, which will need to be further evaluated for applicability and risk for this Project.
- Applicable building codes (e.g., State of California, Port).
- The American Wood Protection Association standards (WWPI, no date).

- Western Wood Preservers Institute recommendations: Best Management Practices for the Use of Preserved Wood in Aquatic and Sensitive Environments (WWPI et al., no date).
- "The Use of Treated Wood Products in Aquatic Environments: Guidelines to West Coast NOAA Fisheries Staff for Endangered Species Act and Essential Fish Habitat Consultations in the Alaska, Northwest and Southwest Regions" (NOAA 2009).
- If ACZA or other treated wood piles are required, these piles will be wrapped with a benign material (e.g., plastic wrap or polyurea coating) to prevent waters of the Bay from direct contact with the treated wood. All wrapped wood piles that may be subject to contact with docks, floating debris, and/or boats will be inspected on a yearly basis to confirm the integrity of the wrap and to repair any damaged areas.

A site-specific Health and Safety Plan would be developed for the Project, and all Project personnel would be required to review and comply with the plan. All Project personnel working in the materials management and handling area or with in-water sediment removal equipment would be required to comply with OSHA and Cal/OSHA regulations and have completed a 40-hour health and safety training course for Hazardous Waste Operations and Emergency Response and any other appropriate safety training identified in the Health and Safety Plan. The Health and Safety Plan would include an Air Monitoring and Sampling Plan to monitor and document conditions in the work zone. In addition, an Ambient Perimeter Air Monitoring Plan would be prepared to address air quality at the perimeter of the work zone to protect nearby receptors. Implementation of the Health and Safety Plan and Ambient Perimeter Air Monitoring Plan would include documentation that field activities have been conducted in a manner protective of workers, other site personnel, and the environment in the immediately surrounding areas. Measures within the Dust, Vapor, and Odor Control Plan would ensure that City and County of San Francisco and BAAQMD requirements for dust control are followed and that air emissions from operations are in compliance with health-protective thresholds.

Management of hazardous materials would be conducted in accordance with the plans and measures described above as well as the following plans, controls, and AMMs (which are further described in Attachment A and above), to prevent the Project from having significant impacts on workers, the public, or environment.

- Environmental Compliance Management Plan (e.g., checklist of monitoring/ inspection and reporting requirements)
- Health and Safety Plan (e.g., identifying potential airborne hazards anticipated for workers)
- Surface Water Quality Management Plan (e.g., water quality monitoring during removal of contaminated sediments)
- Sediment Processing and Construction Water Management Plan (e.g., sediment treatment and dewatering plan, decant water collection, testing, treatment, and discharge/ disposal plans)
- Water Pollution Control Plan or Erosion and Sediment Control Plan (e.g., spill control plan, chemical and fuel storage plans)
- Dust, Vapor, and Odor Control Plan (e.g., track-out controls, stop work limits on windy days)
- Ambient Perimeter Air Monitoring Plan (e.g., field monitoring for dust and vapor for community protection)
- Dust, Vapor, and Odor Control Measures (e.g., idling times, wet suppression methods, haul truck coverings, street sweeping)
- Hazardous Materials Control Measures (e.g., strict adherence to product Safety Data Sheets, possession of hazardous waste transporter licenses, and other permits).

In addition, several permits and Port/agency approval processes would include specific site management practices to ensure compliance with federal, state, and local regulations. These include but are not limited to:

- Water Board Order (Order R2-2013-0019) for the use of Berth 10, which has requirements that include no surface water discharges that would cause deleterious bottom deposits or turbidity or discoloration, no degradation of water supply, no dredged material outside the designated containment area, no nuisance from dust and odor beyond facility boundaries, no discharge of hazardous materials, and no handling of materials other than non-hazardous or inert materials, among others.
- General Permit (Order R2-2015-0035, NPDES Permit CAG982001) for discharges from aggregate mining, marine sand washing, and sand offloading facilities which could be used for discharge of treated decant water directly to the Bay at Pier 96. Alternately, an individual NPDES permit may be obtained or a permit could be issued by SFPUC for discharge to the sanitary sewer, which includes discharge limitations.

With implementation of the plans, controls, and AMMs and requirements imposed through the permitting process, impacts on the public or the environment related to the routine transport, use, or disposal of hazardous materials would be less than significant.

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? **(*Less Than Significant Impact*)**

As described above, the Project will involve the dredging, transport, drying, and disposal of contaminated sediments. Accordingly, project construction equipment and vehicles could accidentally release hazardous materials, such as oils, grease, fuels, or sediments containing chemicals. Accidental spills or leaks of these materials could affect surface water quality or could result in adverse health effects due to contact with construction workers, the public, and the environment.

The potential hazards of these conditions would be mitigated through proper maintenance and operation of systems, machinery, and vehicles; proper storage of fuels and fueling of equipment; marking of underground utilities; and enforcement of safe work practices and other safety provisions as required under the project Health and Safety Plan, and Erosion and Sediment Control Plan (see Attachment A). Project-required contractor plans and control measures as described in Attachment A would reduce the risk of spills or leaks from reaching the environment. Control measures and AMMs listed in Attachment A that would be implemented to prevent hazards to the public or environment include: general construction/remediation, dust, vapor and odor controls, hazardous materials, safety, and transportation. In addition, an Environmental Compliance Management Plan would be implemented to provide compliance monitoring during construction to guide the implementation of construction control measures and to document conformance with the details provided in the plans and specifications of the remedial design. Therefore, hazards to the public or environment would be less than significant.

c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? **(*No Impact*)**

Because there are no existing or proposed schools within one-quarter mile of the Project Area or the proposed MHFs, there would be no hazardous or acutely hazardous emissions or handling of materials, substances or wastes near schools.

d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? **(*No Impact*)**

The list of sites compiled in accordance with Government Code Section 65962.5 is also known as the "Cortese List." The Project Area is not included on the Cortese List (DTSC 2020). Additionally, the Regional Water Board is providing active oversight of the investigation and remediation of the Project Area to ensure that the Project would not create a significant hazard to the public or environment. Therefore, the Project would have not create a significant hazard to the public or environment in relation to the Cortese List.

e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area? **(*No Impact*)**

The closest airport to the Project Area and the Pier 96 area is San Francisco International Airport, located approximately 14 miles to the south. The closest airport to Berth 10 is Oakland International Airport, approximately 11 miles to the south. The Project Area and the MHFs are not located within any of the planning boundaries established for San Francisco International Airport (City/County Association of Governments of San Mateo County 2012) or Oakland International Airport (Port of Oakland 2006). Therefore, the Project would not result in airport-related safety hazards or noise.

f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? **(*No Impact)***

The City and County of San Francisco Emergency Management Program includes emergency management actions for the prevention of, preparedness for, response to, and recovery from any emergency or disaster (City and County of San Francisco 2017). The Project would generate additional traffic during remediation activities (see Section 5.17 for a more detailed discussion of transportation impacts), but this temporary increase in vehicles would not impede or hinder the movement of emergency vehicles in the vicinity of the Project Area or MHF. The Project would not involve any other changes that could increase congestion during an emergency evacuation, such as direct physical changes to the city street grid, blockage of pedestrian traffic, or increased numbers of residents or employees (other than temporary construction workers). Therefore, the Project would have no impact on an adopted emergency response or evacuation plan.

g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires? **(*No Impact*)**

The Project Area is located within the Bay and the MHFs are in developed industrial areas. There are no wildlands near these areas. According to CAL FIRE, San Francisco County has no VHFHSZs and Berth 10 is not located in or near any Very High Fire Hazard Severity Zones (CAL FIRE 2020). Therefore, the Project would have no impact related to wildland fires.

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5.10 Hydrology and Water Quality

Would the project:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☐	☒	☐
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☒
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would	☐	☐	☒	☐
i) result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☐	☒
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
iv) impede or redirect flood flows?	☐	☐	☐	☒
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

Project Activities Likely to Create an Effect:

- In-water construction activities (e.g., debris removal, dredging, pile driving/removal, and capping/armor placement)
- Management of sediments and decant water during sediment drying
- Disposal of sediments at ocean and/or wetland reuse sites

Existing Environmental Conditions:

The Project Area is located mostly within subtidal and intertidal areas of the central Bay. The largest tidal fluctuations along the northern waterfront are from approximately –1.5 to +7.0 feet MLLW, but typical daily tidal variations are about half as large. The Project Area exhibits varying mudline elevations depending on sedimentation rate and vessel activities and portions are dredged every 3 to 5 years to ensure safe navigation for vessels berthed there. Depressions resulting from propeller wash ("scour areas") suggest that the primary hydrodynamic driver near the shoreline of the Project Area is vessel traffic. The bathymetric survey also documents considerable debris beneath the former Pier 43 footprint, which is attributed to debris remaining from the pier demolition (Haley & Aldrich 2020a).

The MHFs are located in industrial areas on the Bay in San Francisco and Oakland. Per Port maintenance dredge permits, the berths at Pier 96 are authorized to be maintained at a depth of –40 feet MLLW to allow vessel loading and unloading.

Berth 10 is authorized to be maintained at a depth from–50 feet MLLW according to the Oakland Harbor Navigation Improvement Project (USACE 2020).

Ambient water and sediment contaminant concentrations are routinely monitored by the Regional Monitoring Program for Water Quality in San Francisco Bay. This information is used by the Regional Water Board to assess status and trends of contaminants throughout the Bay and develop guidance for the protection of the Bay's waters. Based in part on these data, the Regional Water Board has listed the Central Basin as an impaired water body for chlordane, dichlorodiphenyltrichloroethane (DDT), dieldrin, dioxin compounds, furan compounds, polychlorinated biphenyls, mercury, selenium, trash, and invasive species. PAHs are not broadly listed on the CWA 303(d) list for the Bay; impairments are limited to specific areas within the Bay (State Water Resources Control Board 2018).

Remedial Investigation Results

Results presented in the Remedial Investigation (Haley & Aldrich 2020a) suggested that site-specific impairment of the beneficial uses of the waterway may occur for bulk sediment PAH-25 concentrations between 100,000 and 400,000 µg/kg, with the weight of evidence suggesting the upper end of that concentration range is more likely. To be conservative, a bulk sediment PAH-25 concentration of 100,000 µg/kg was chosen as the site-specific screening threshold to preliminarily identify remedial response areas.

In general, the highest PAH concentrations and a greater lateral extent of PAH concentrations above the 100,000 µg/kg screening threshold were observed in the deeper sediments. The majority of the surface and shallow sediments with PAH concentrations greater than 100,000 µg/kg are found within Areas B, C, and D. Areas A and E do not have surface sediments that exceed the screening threshold (Haley & Aldrich 2021).

A pre-design investigation (Haley & Aldrich 2020b) was conducted in 2020 to confirm the extent of concentrations of PAHs above the screening threshold and collect additional pre-design data to assist in development of the remedial design. The pre-design investigation confirmed the absence of contamination under Pier 39 and within the footprint of the former Pier 37 structure (adjacent to the

Pier 39 East Basin breakwater), verified that the proposed screening threshold would be protective, and did not alter the conceptual site model or knowledge of the extent of contamination. The 100,000 µg/kg PAH-25 concentration in bulk sediment was adopted as the project RAL.

Project Area Water Resources and Infrastructure

Stormwater runoff adjacent to the Project Area from Piers 39 to 43½ infiltrates into landscaped areas, flows into city stormwater catch basins, or enters the Port's stormwater system. City stormwater is routed outside of the Project Area, except at times of high rainfall when it is discharged through the combined sewer outfall shown in Figure 3-1. There are four stormwater outfalls in the uplands adjacent to Piers 39 to 43½ owned and operated by the Port that discharge into the Project Area (Figure 3-1). Two additional stormwater outfalls discharge to the Fisherman's Wharf Lagoon to the west (Haley & Aldrich 2020a).

Stormwater at the Pier 96 terminal is managed through the Port's stormwater infrastructure comprised of stormwater collection inlets/manholes and storm gravity pipes that flow into one of four outfalls located within Pier 96. Each outfall discharges directly to the Bay. Port stormwater infrastructure documents and a recent PG&E elevation and utility survey of the Pier 96 MHF project areas confirm the location of the collection inlets/manholes and the storm gravity pipe which flows to outfall C at Pier 96's North Berth area.

Dredging and capping would take place within a portion of the central Bay. There are no other surface water resources (streams, river, lakes, wetlands, etc.) located within the Project Area.

Regulatory Framework:

Below is a brief discussion of the applicable federal, state, regional, and local statutes and regulations that pertain to protection of water resources in the Bay.

Federal Regulations

Clean Water Act

The CWA requires the State of California to adopt and enforce water quality standards to protect the Bay. As established through the Porter-Cologne Act, the State Water Resources Control Board shares responsibility with the Regional Water Board for implementation of the CWA's provisions as they relate to water quality in the Bay. Several sections of the CWA are relevant to the Project:

- Discharge Permit. A permit is needed for water discharges related to processing of treated water discharged directly to the Bay, which could be conducted under the General Permit (Order R2-2015-0035, NPDES Permit CAG982001) for discharges from aggregate mining, marine sand washing, and sand offloading facilities, or an individual NPDES permit could be obtained. Alternately, if decant water is discharged to the sewer, the SFPUC could issue a Wastewater Discharge Permit for industrial operations and Batch Wastewater Discharge Permits for activities that generate non-routine, episodic, or other temporary discharges through non-industrial processes.
- Water Quality Certification. CWA Section 401 water quality certifications are issued to applicants for a federal license or permit for activities that may result in a discharge into waters of the U.S., including but not limited to the discharge of dredged or fill material. Section 401 requires certification from the State Water Resources Control Board verifying that the dredge or fill project is in compliance with all state water quality standards.
- Permits for Dredged or Fill Material. Under Section 404, the USACE has primary responsibility for administering regulations for disposal of dredged or fill material in U.S. waters.

- Section 303(d) of the CWA requires the State of California to compile a list of water bodies that donot meet, or are not expected to meet, water quality standards; these water bodies are identified as “impaired” water bodies.

Rivers and Harbors Act

The RHA (33 USC 403) governs specified activities in navigable waters. Section 10 of the RHA regulates structures placed in or on navigable waters.

Coastal Zone Management Act

The authority to evaluate projects conducted, funded, or permitted by the federal government in the coastal zone is granted to coastal states through the federal CZMA of 1972, (USC Title 16, Sections 1451 et seq.) as amended. The CZMA requires that federal actions be consistent to the maximum extent practicable with federally approved state coastal plans.

Marine Protection, Research, and Sanctuaries Act

The MPRSA is administered by the EPA, and USACE is the federal agency that manages permits authorizing the ocean disposal of dredged materials. There are specific testing requirements to determine whether the material is suitable for unconfined aquatic disposal SF-DODS. USACE must obtain concurrence from the EPA for any disposal at SF-DODS before it can approve a permit. The potential for obtaining an MPRSA permit for offshore ocean disposal is uncertain as the quantity of material eligible for SF-DODS from the Project is low.

State Regulations and Guidance

Porter-Cologne Water Quality Control Act

Under the Porter-Cologne Water Quality Control Act (California Water Code, Division 7), the State Water Resources Control Board has authority over “waters of the state” and water quality. “Waters of the state” are defined as “any surface water or groundwater, including saline waters, within the boundaries of the state” (California Water Code Section 13050[e]). The Regional Water Boards have local and regional authority. The Porter-Cologne Water Quality Control Act (California Water Code Article 3 Section 13240) requires the Regional Water Boards to formulate and adopt Basin Plans and periodically review and update the plans, which establish:

- Beneficial uses of water designated for each protected water body
- Water quality objectives for both surface water and groundwater to ensure the reasonable protection of beneficial uses and the prevention of nuisance (California Water Code Article 3, Section 13241)
- Actions necessary to maintain these water quality objectives.

Projects that will discharge waste to waters of the state must file a report of waste discharge with the appropriate Regional Water Board, if the discharge could affect the quality of waters of the state (California Water Code Article 4, Section 13260). The appropriate Regional Water Board will issue WDRs or a waiver of the WDRs for the project. The requirements will implement any relevant Water Quality Control Plans that have been adopted, and must take into consideration the beneficial uses to be protected and the water quality objectives reasonably required for that purpose (California Water Code Article 4, Section 13263).

The Regional Water Board may issue individual or general WDRs for discharges of dredged or fill material to waters of the State (California Water Code Article 4, Section 13263). Projects requiring water quality certification under CWA Section 401 also require WDRs under the Porter-Cologne Act.

The State Water Resources Control Board adopted general WDRs for projects with dredge or fill discharges that received 401 Certification (Water Quality Order No. 2003 – 0017 – DWQ), under which the Regional Water Board retains discretion to issue individual or general WDRs.

Ocean Protection Council Sea Level Rise Guidance

This guidance aims to synthesize key scientific findings as they relate to sea level rise, and provide a step-by-step approach for state and local agencies to incorporate and adapt to the latest sea level rise projections. With respect to the baseline year 2000, there is a 50 percent chance that sea level rise will meet or exceed 4.1 feet assuming a high emission scenario. The high emission scenario is also known as the “business as usual” scenario for CO_2 emissions. Following the “business as usual” scenario, there is a 100 percent chance that sea level rise will exceed 1 foot by 2150, and a 96 percent chance that it will exceed 2 feet by 2150. Following the low emission scenario, which requires drastic cuts in CO_2 emissions, there is a 50 percent chance that sea level rise in the Project Area will meet or exceed 2.4 feet by 2150. (Griggs et al. 2017).

Regional and Local Regulations, Plans, and Agencies

San Francisco Bay Basin (Region 2) Water Quality Control Plan

The San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan) is the master policy document pertaining to the legal, technical, and programmatic structure for regulating water quality in the Bay. The Basin Plan offers guidelines for the protection of surface waters (i.e., freshwater lakes, rivers, and streams), estuaries, enclosed bays, and ocean waters, and describes the water quality control measures that are necessary to protect the beneficial uses of the Bay. The Basin Plan identifies the beneficial uses for each segment of the Bay and its tributaries, water quality objectives for the reasonable protection of the applicable uses, and an implementation plan for achieving the water quality objectives (Regional Water Board 2019).

The central Bay has designated beneficial uses of Industrial water use (IND), Process wastewater (PROC), Commercial Fishing (COMM), Shellfishing (SHELL), Estuarine habitat (EST), Migratory species habitat (MIGR), Rare and endangered species habitat (RARE), Spawning habitat (SPWN), Wildlife habitat (WILD), Contact recreation (REC-1), Non-contact recreation (REC-2), and Navigation (NAV) (Regional Water Board 2019).

San Francisco Bay Conservation and Development Commission

BCDC is the agency responsible for implementing the McAteer-Petris Act. The act empowers BCDC to issue permits for all filling and dredging in the Bay (as well as 100 feet inland from the high tide line). BCDC also administers the federal CZMA within the Bay segment of the California coastal zone. A BCDC permit would be required for any fill in the Bay and development within the 100-foot shoreline band.

San Francisco Bay Dredged Material Management Office

The DMMO evaluates dredge material suitability for beneficial reuse. The DMMO comprises the following agencies: USACE, the EPA, the Regional Water Board, BCDC, and CDFW. Beneficial reuse acceptance criteria for sediment are established in the Draft Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines (Regional Water Board 2000).

San Francisco Bay Regional Water Quality Control Board

NPDES permits are required for water discharges related to processing of treated water discharged directly to the Bay. Discharging of treated water could be conducted under the General Permit (Order

R2-2015-0035, NPDES Permit CAG982001) for discharges from aggregate mining, marine sand washing, and sand offloading facilities, or an individual permit may be needed.

The Regional Water Board issued WDR Order No. R2-2013-0019 authorizing Berth 10 as a “multi-user dredged material rehandling facility, meaning that dredgers other than the Port of Oakland may make arrangements with the Port of Oakland to rehandle dredged material for eventual upland disposal or beneficial reuse.” This permit would apply to any dewatering activities at Berth 10.

San Francisco Public Utilities Commission

Discharges from the SFPUC’s combined sewer storage and treatment systems are regulated under Regional Water Board Order No. R2-2013-0029, NPDES permit No. CA0037664. This permit defines WDRs including discharge prohibitions, effluent limitations, receiving water limitations, and provisions including monitoring and reporting requirements and pretreatment programs. A permit will be required if decant water is discharged to the sewer. The SFPUC issues Wastewater Discharge Permits for industrial operations and Batch Wastewater Discharge Permits for activities that generate non-routine, episodic, or other temporary discharges through non-industrial processes.

As part of its pre-treatment program, the SFPUC manages the Construction Site Runoff Control Program to ensure that all construction sites implement BMPs to control construction site runoff in accordance with the City and County of San Francisco’s Construction Site Runoff Control Ordinance. All construction sites must implement BMPs and, if a construction activity within San Francisco disturbs 5,000 square feet or more of ground surface, applicants must also submit an Erosion and Sediment Control Plan and a Project Application before starting construction-related activities. Projects requiring a Stormwater Pollution Prevention Plan/Water Pollution Control Plan under the Construction General Permit may submit the Stormwater Pollution Prevention Plan/Water Pollution Control Plan in lieu of an Erosion and Sediment Control Plan to comply with the Construction Site Runoff Control Program. A Stormwater Pollution Prevention Plan is required to comply with the State Water Resources Control Board’s NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities where the Project will disturb more than 1 acre of land. A Water Pollution Control Plan should be developed for all construction sites regardless of size.

Port of San Francisco Building Code

Port of San Francisco Building and Encroachment Permits. These permits require an Erosion and Sediment Control Plan if a project disturbs more than 5,000 square feet of uncovered ground surface (cumulatively). A Stormwater Pollution Prevention Plan may be submitted in place of or in addition to an Erosion and Sediment Control Plan if the project is more than 1 acre.

San Francisco General Plan, Sea Level Rise Vulnerability and Consequences Assessment

With 4 square miles of San Francisco located within a sea level rise vulnerability zone, the City and County of San Francisco have been considering sea level rise in its planning for many years. Following the goals outlined in the Sea Level Rise Action Plan, the Sea Level Rise Vulnerability and Consequences Assessment aims to evaluate vulnerability and risk. The assessment provides an understanding of the vulnerabilities of public assets and infrastructure to sea level rise and the consequences of sea level rise-related flooding on people, the economy, and the environment (San Francisco Planning Department 2020).

The Project Area is located within a sea level rise vulnerability zone, indicating that the uplands adjacent to or part of the Project Area could be flooded by a 100-year coastal flood event coupled with 66 inches of sea level rise, an upper-range scenario by end of century. Pier 96 provides important industrial services that require access to marine terminals. Pier 96 is currently subject to flooding during extreme high tides, and this flooding will become more severe as sea levels rise. Pier 96 would experience significant flooding beginning at Sea Level Rise Scenario 4 (48 inches of sea level rise or 6 inches of sea level rise and a 100-year extreme tide) and Scenario 5 (52 inches of sea level rise, or 12 inches of sea level rise and a 100-year extreme tide). With 52 inches of sea level rise, 21 percent of Pier 96 would become inundated. In addition, utilities, transportation, and open spaces located in the Project Area may be significantly affected by sea level rise projections for the next 100 years (San Francisco Planning Department 2020).

Beginning at Sea Level Rise Scenario 3 (36 inches of sea level rise within 100 years), Pier 96 would begin to experience overtopping. By Scenario 7 (77 inches of sea level rise within 100 years), uplands adjacent to Piers 39 to 43½ would experience overtopping and be inundated. Overtopping refers to the phenomenon of the sea level rising over the top of a barrier constructed to hold it back. Inundation, on the other hand, refers to complete flooding (San Francisco Planning Department 2020).

BCDC Environmental Justice Plan

In its Environmental Justice Plan, BCDC acknowledges that shoreline flooding will affect communities differently depending on their resources, location, and adaptive capacity. More specifically, low-income and marginalized communities may experience more difficulty recovering from a flood and be disproportionately exposed to hazardous toxic substances exacerbated if contaminants are mobilized by floods. Rising sea levels caused by climate change will affect various areas differently, and adaptation to rising seas poses additional challenges to those with fewer financial, social, and political resources (BCDC 2019). Relevant policies of the Environmental Justice Plan include the following:

- Policy 1: New shoreline protection projects and the maintenance or reconstruction of existing projects and uses should be authorized if (a) the project is necessary to provide flood or erosion protection for (i) existing development, use or infrastructure, or (ii) proposed development, use or infrastructure that is consistent with other Bay Plan policies; (b) the type of the protective structure is appropriate for the project site, the uses to be protected, and the erosion and flooding conditions at the site; (c) the project is properly engineered to provide erosion control and flood protection for the expected life of the project based on a 100-year flood event that takes future sea level rise into account; (d) the project is properly designed and constructed to prevent significant impediments to physical and visual public access; and (e) the protection is integrated with current or planned adjacent shoreline protection measures and (f) adverse impacts to adjacent or nearby areas, such as increased flooding or accelerated erosion, are avoided or minimized. If such impacts cannot be avoided or minimized, measures to compensate should be required. Professionals knowledgeable of the Commission's concerns, such as civil engineers experienced in coastal processes, should participate in the design process.
- Policy 6: Public access should be sited, designed, managed and maintained to avoid significant adverse impacts from sea level rise and shoreline flooding.
- Policy 7: Whenever public access to the Bay is provided as a condition of development, on fill or on the shoreline, the access should be permanently guaranteed. This should be done wherever appropriate by requiring dedication of fee title or easements at no cost to the public, in the same manner that streets, park sites, and school sites are dedicated to the public as part of the subdivision process in cities and counties. Any public access provided as a condition of development should either be required to remain viable in the event of future sea level rise or flooding, or equivalent access consistent with the project should be provided nearby.

Evaluation of Environmental Effects:

a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality? **(*Less Than Significant Impact*)**

PAHs

For PAHs, the Basin Plan (Regional Water Board 2019) provides a water quality objective of 15,000 nanograms per liter (ng/L) in marine surface waters (24-hour average) to protect beneficial uses of all marine surface waters in the Bay region unless a site-specific objective has been adopted (Regional Water Board 2019).

Pore water sampling during the remedial investigation confirmed that any potential sources of dissolved-phase PAHs to surface water, from either historical upland or unknown in-water point sources, do not appear to contribute concentrations in surface water approaching the Basin Plan water quality objective. Pore water concentrations exceeded the Basin Plan water quality objective in only three locations in the main investigation area, and these were all locations with some of the highest shallow sediment PAH-25 concentrations (above 100,000 µg/kg). Shoreline zone surface water results were all well below the water quality objective (approximately 200 to 3,000 ng/L; Haley & Aldrich 2020a). Because the Project would remove PAH-contaminated sediments from the Project Area, water quality objectives for PAHs are expected to be met following dredging activities.

Dredge elutriate testing (DRET) was also performed on several samples during the Remedial Investigation (Haley & Aldrich 2020a). DRET testing procedures were developed by USACE as a predictive tool for estimating the degree of contaminant release from sediments due to resuspension during dredging. The DRET test consists of mixing sediment and water and allowing the slurry to settle for a period of time and then analyzing the elutriate for contaminants. The results can be used to evaluate the potential for water quality issues during dredging. DRET results after settling for both zero and 4 hours showed PAH concentrations well below the water quality objective, indicating a low potential for water quality exceedances during dredging as long as turbidity is controlled (see further discussion below). The post-RI DRET evaluation included toxicity bioassays on the elutriate samples. No elutriate samples produced during the DRET evaluation demonstrated any toxicity. All samples showed 100 percent survival after 96-hour exposure (Haley & Aldrich 2021). Additional DRET testing is planned for during pre-mobilization activities, as described below

Turbidity and Other Water Quality Parameters

BCDC and other resource agencies would review and issue permits and approvals for dredging of contaminated sediments in the nearshore and intertidal areas of the Project Area. Project activities that would require the application of BMPs include the use of environmental clamshell buckets to minimize the resuspension of dredged sediments in Bay waters at the Project Area.

In addition to dredging, other constructions activities, such as capping, placement of riprap/armor, and removal and replacement of pilings, may result in increases in turbidity and other water quality impacts within the turbidity curtains. There could be surface water runoff from the MHF and associated water quality impacts from installation/removal of the transload deck that could lead to temporary increased turbidity and/or water-column impacts within the turbidity curtains. The contractor would prepare and implement a Surface Water Quality Monitoring Plan (outlined in Attachment A) which would include the use of a turbidity curtain to reduce impacts associated with dredging.

Beneficial Reuse and Ocean Disposal

A limited quantity of material from Area E is likely to qualify as suitable for beneficial reuse or would be clean enough to be disposed of at SF-DODS. The beneficial reuse screening values are subject to modification with site-specific waste discharger requirements issued under permits to any new beneficial reuse site. While it would be technically feasible to segregate dredged material that would meet the beneficial reuse acceptance criteria (Regional Water Board 2000), it may not be cost-effective to do so. Two beneficial reuse sites are currently permitted to receive material: the Montezuma Wetlands Restoration Project and the Cullinan Ranch Restoration Project. In addition, there are four beneficial reuse sites that are expected to be permitted to receive dredge material in the near future (Figure 4-9). Any material that would be suitable for disposal at SF-DODS or at beneficial reuse sites would have relatively low PAH concentrations. Temporary increases in turbidity may occur during disposal but would be reduced by implementation of control measures and plans described below and by following compliance and management requirements specific to disposal at these sites.

Plans, Controls, and AMMs

In order to meet water quality standards and/or WDRs and prevent degradation of surface or groundwater quality, all work would be conducted in accordance with the plans and measures described above as well as the plans, controls, and AMMs described below and in Attachment A. Compliance and monitoring plans include.

- Environmental Compliance Management Plan (e.g. checklist of applicable environmental rules and regulations of federal, state, and local agencies)
- Surface Water Quality Monitoring Plan (e.g. descriptions of temporary enclosures, including turbidity curtains, a description of water quality monitoring to verify effectiveness of temporary enclosures at limiting the spread of visible pollutants)
- Water Pollution Control Plan or Erosion and Sediment Control Plan (e.g. plan for monitoring runoff when water is used for dust control on stockpiles, plan for monitoring erosion and sediment migration from stockpiles)
- Dredging and Capping Operations Plan (e.g. approach and sequencing for dredging and capping activities to reduce impacts to human and environmental health)
- Sediment Processing and Construction Water Management Plan (e.g. sediment treatment and dewatering plan, decant water collection, testing, treatment, and discharge/ disposal)
- Material Handling Facility Control Measures (e.g. any accumulated water would be collected from a low point within the bermed area and pumped into a portable storage tank, tested, and treated if necessary).

Control measures (Attachment A) would be implemented to minimize accidental loss and disturbance of the sediments/water column during dredging and material handling (Haley & Aldrich 2021), as follows:

- Environmental clamshell buckets will be the primary buckets used during dredging. Due to their hydraulic closing mechanism, these buckets would reduce loss of sediment into the water column. After removal, sediment would be placed into barge scows, with water entrained, and transported to the MHF for offloading and processing
- Barges or scows would be maintained in watertight conditions to prevent water and/or sediment from leaking during sediment loading or while in transit.
- Unloading procedures would be tightly controlled to reduce spillage. Loaded barges or scows at the MHF would be secured adjacent to the shoreline prior to offloading. Free liquid that has separated from dredged material in scows or barges may be pumped directly to the temporary wastewater treatment system. Dredged material would be transferred into articulated off-road trucks with sealed tailgates using an excavator or similar equipment suitable for the task. Spill aprons may be deployed between the full scow and the

transloading area to minimize the potential loss of any materials to the water column during the offloading process.

- A turbidity control system and BMPs consisting of turbidity curtains and absorbent booms would be installed to minimize potential discharges from either the enclosed in-water work areas or as a result of material transfers between the dredging/capping equipment and material barges. Turbidity control systems would also be installed around material barges when offloading at the MHF and around active work areas. Oil absorbent booms would be installed inboard, and as necessary, outboard, of the turbidity curtain(s) to address floating product. The remedial design would evaluate potential configurations and specifications for the turbidity control system.
- A temporary wastewater treatment plant would be used to treat decanted water at the MHF. The design would be based on the results of additional testing performed during pre-mobilization activities and include processes designed to meet the discharge requirements established for the Project. Where discharge back to the Bay or to a sewer is not possible, treated water may be transported offsite for disposal.

Additional standard construction control measures (Attachment A) would be implemented to eliminate or minimize any stormwater discharge to waters at the MHF and at the Project Area during all construction/remediation activities. These include: general construction/remediation, hazardous, and biological control measures.

Compliance with permit conditions would further serve to minimize any impacts on water quality. One or more of the following permits would be required for the Project:

- CWA Section 401 permits are issued for activities that may result in a discharge into waters of the U.S., including but not limited to the discharge of dredged or fill material. Section 401 requires certification from the State Water Resources Control Board verifying that the dredge or fill project is in compliance with all state water quality standards.
- CWA Section 404 requires a permit before dredged or fill material may be discharged into waters of the U.S.
- Discharge Permit. A permit is needed for water discharges related to processing of treated water discharged directly to the Bay, which could be conducted under the General Permit (Order R2-2015-0035, NPDES Permit CAG982001) for discharges from aggregate mining, marine sand washing, and sand offloading facilities, or an individual NPDES permit could be obtained. Alternately, if decant water is discharged to the sewer, the SFPUC could issue a Wastewater Discharge Permit for industrial operations and Batch Wastewater Discharge Permits for activities that generate non-routine, episodic, or other temporary discharges through non-industrial processes.
- Port of San Francisco Building and Encroachment Permits. These permits require an Erosion and Sediment Control Plan if a project disturbs more than 5,000 square feet of uncovered ground surface (cumulatively). A Stormwater Pollution Prevention Plan may be submitted in place of an Erosion and Sediment Control Plan if the project is more than 1 acre.

Permit requirements, as well as implementation of plans, controls, and AMMs, described above, would limit temporary impacts. Due to the implementation of the above-described plans, controls, and AMMs, and requirements imposed through the permitting process, the potential for the Project activities to violate water quality standards or WDRs or affect surface water quality would be less than significant.

b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? (***No Impact***)

The Project would have no impact on groundwater because it would not use groundwater or interfere with groundwater recharge. .

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

i. *Result in substantial erosion or siltation on- or off-site? (**Less Than Significant Impact)***

The Project Area is located in the Bay or on completely impervious surfaces, so there is minimal potential for erosion. There is the potential for minor amounts of dredged material to spill from the transloading dock into the Bay, causing minor siltation. Implementation of the surface water and stormwater plans and other control measures (e.g., using a spill apron, constructing a berm around any stockpiled material at the MHF) described in Attachment A and section (a) above would minimize any siltation. Therefore, the erosion and siltation impact would be less than significant.

ii. *Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or offsite?* ***(No Impact)***

As described above, the Project takes place in the Bay or on already impervious surfaces. Implementation of stormwater best management practices will ensure that runoff from staging areas is properly managed. Implementation of the NPDES permit for the materials rehandling area will ensure decant water is contained and properly treated. Accordingly, there will be less-than-significant impacts to surface runoff, and no likelihood of increasing flooding on- or off-site.

iii. *Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?* ***(Less Than Significant Impact)***

As described above, the Project would not create or contribute runoff that would exceed the capacity of existing stormwater drainage systems. No additional stormwater drainage systems are proposed. The Project's surface water and stormwater plans would ensure that any runoff created would be minimized and properly managed and NPDES and/or WDR permits would minimize and properly manage any potential sources of polluted runoff. Therefore, the impact on existing drainage systems due to runoff water would be less than significant.

iv) Impede or redirect flood flows? (***No Impact***)

There are no streams or rivers present in the Project Area or the adjacent upland area, and no impervious surfaces would be added. Temporary construction facilities would be built at the MHF to support sediment handling activities, but they would not impede or redirect flood flows. The Project would not change the topography of the MHF in any way that would redirect flood flows. The Project would not include the construction of any structures offshore or in the adjacent upland area that would impede or redirect flood flows. Therefore, there would be no impact on flood flows.

d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation? (***No Impact***)

The Project Area and the MHF location at Pier 96 are within the 100-year flood zone (San Francisco Floodplain Management Program 2015). Most of the Project Area is also in sea level rise inundation zones and subject to inundation and overtopping of the seawall under various scenarios of sea level rise.

Sea level rise resiliency was evaluated in FS/RAP as requested by the Regional Water Board, given the potential impact of climate change on the Bay. The following indicators were considered as part of the sea level rise resiliency evaluation:

- How climate change could mobilize residual contamination or otherwise impact remedy effectiveness; and
- Ability of the remedy to be incorporated in any potential future Port or City of San Francisco projects for sea level rise resiliency and adaptability.

The FS/RAP found that sea level rise is not anticipated to affect contaminant mobilization, as any residual contamination would be either capped or removed. Sea level rise could actually lead to a reduction of erosive forces as a result of increased water depths and the increased distance between the sediment or capped surface and currents inducing erosion. There will be an additional armored buffer zone between the existing seawall and rock revetments under the Embarcadero and the armored and capped areas. This buffer zone would provide further protection by armoring sediment outside the dredged and capped areas, while maintaining the flexibility for sea level rise resiliency adaptations that may need to be tied into the remedy.

The FS/RAP also assessed possible adverse conditions related to potential changes in 100-year storm conditions. While the cap will be designed for a 100-year storm event, it is understood that the conditions defining a 100-year storm event may shift because of climate change. As such, the armoring design will be evaluated for an estimated future 100-year storm event (e.g., estimated wind speeds and currents) to the extent possible to maintain a conservative design. However, propeller-induced scour, not wind and wave related storm effects, is considered the primary design driver for the protective armoring. Consequently, changes in storm conditions because of climate change are not anticipated to substantially change the cap design.

In addition to considering the implications of potential sea level rise (and associated resiliency projects), other climate change impacts such as potential changes in 100-year storm conditions will be further evaluated during the design.

In the event that a tsunami occurred during Project implementation, there is a risk that construction equipment and dredged sediments could be washed into the Bay from either the Project Area or the MHF. Adherence to earthquake warnings will mitigate this risk by helping to ensure that workers, and if possible, equipment could be moved out of the tsunami zone before the tsunami waves reached the Project Area or MHF.

Seiches are not considered water hazards in the Bay. The upland area adjacent to Piers 39 to 43½ is located within a tsunami inundation area and flood zone (State of California 2021), however the Project does not have an upland component, other than short term staging and material handling.

Based on the discussion above, hazards from flooding, tsunami, or seiche zones, and the risk release of pollutants due to project inundation (associated with sea level rise) are less than significant.

e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? **(*Less Than Significant Impact*)**

The purpose of the Project is to remove contamination that is adversely affecting beneficial uses of the Bay. Therefore, broadly speaking, the Project is consistent with implementation of the Water Quality Control Plan for the San Francisco Bay Basin. While dredging activities, debris and pile removal, surface water runoff from the MHF, and disposal of dredged material at SF-DODS or a beneficial reuse site and any accidental spillage from the barge or transload deck may could result in temporary violations of the turbidity and PAH water quality objectives from the resuspension/discharge of contaminated sediments. Compliance and monitoring plans include:

- Surface Water Quality Monitoring Plan (e.g., description of water quality monitoring during removal of contaminated sediments and placement of capping materials, descriptions of turbidity curtains and temporary enclosures)
- Stormwater Pollution Prevention Plan (e.g., plan for monitoring erosion and sediment migration from stockpiles)

With the implementation of the control and monitoring measures detailed above, as well as those described in section (a) above temporary impacts to water quality would be avoided or minimized in order to comply with the Basin Plan.

The temporary wastewater treatment plant used to treat decanted water at the MHF would be designed to meet the discharge requirements established in permits for the Project. Where discharge back to the Bay or to a sewer is not possible, treated water may be transported offsite for disposal.

There are no sustainable groundwater management plans relevant to the Project Area.

Based on the discussion above and in section (a), with implementation of plans, controls, and AMMs (Attachment A) to properly manage construction to eliminate or minimize impacts on water quality, impacts related to obstruction of a Water Quality Control Plan or Sustainable Groundwater Management Plan would be less than significant.

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5.11 Land Use and Planning

Would the project:

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

Project Activities Likely to Create an Effect:

- In-water construction activities (e.g., debris removal, dredging, pile driving/removal, and capping/armor placement)
- Material handling (e.g., facility construction)

Existing Environmental Conditions:

The Project Area is located mostly within submerged areas of the Bay. The MHF sites are in industrial areas in San Francisco and Oakland. In San Francisco, the uplands adjacent to the Project Area between Piers 39 and 43½ are zoned commercial, for "community business," and Pier 96 is zoned for heavy industry (San Francisco Planning Department 2020). In Oakland, Berth 10 is zoned "General Industry and Transportation" (City of Oakland 1998).

In the Project Area, there is a high concentration of visitor-related commercial development, including more than 120 shops and other visitor attractions, including a carousel, an aquarium, and a 300-boat public marina at Pier 39. Fresh seafood restaurants, chowder houses, and crab shacks also occupy a substantial portion of the upland adjacent to the Project Area (Port of San Francisco 2019). Bay scenic cruise boats and ferry terminals and their supporting infrastructure are located at the Pier 39 West Basin, Pier 41½, and Pier 43½. The Red and White Fleet operates landside concessions and provides sightseeing Bay cruises from Pier 43½ with several daily departures on vessels that average a 400-passenger carrying capacity. The Blue & Gold Fleet provides ferry service from Pier 41½ to Sausalito, Tiburon, and Angel Island and through its contract with WETA service to Vallejo/Mare Island, Alameda, Oakland, Harbor Bay, South San Francisco, and Richmond. There are no sensitive land uses (e.g., hospitals, schools, daycares, nursing homes) within ¼ mile of the Project Area. No residences immediately adjoin the Project Area, but there are hotels and apartment buildings within three blocks.

The MHFs are both composed of asphalt/concrete-covered land with pile-supported concrete berthing. Pier 96 was previously used as a container handling facility and continues to house maritime and material management uses. The Pier 96 terminal is surrounded by other Port cargo terminals, facilities with access to freight rail, facilities to serve maritime and non-maritime uses, and the Illinois Street Bridge and highways.

Berth 10 is permitted for dredged material handling and management. Surrounding land uses are all industrial, consisting of large warehouses, tug services, and ship loading operations.

Regulatory Framework:

Federal Regulations (Coastal Zone Management Act)

The authority to evaluate projects conducted, funded, or permitted by the federal government in the coastal zone is granted to coastal states through the federal CZMA of 1972 (USC Title 16, Sections 1451 et seq.), as amended. The CZMA requires that federal actions be consistent to the maximum extent practicable with federally approved state coastal plans.

State Regulations (McAteer-Petris Act)

The McAteer-Petris Act of 1965 (California General Code Section 66600 et seq.), as amended, directs the BCDC to exercise its authority to issue or deny permit applications for placing fill, extracting materials, or changing the use of any land, water, or structure within the area of its jurisdiction, in conformity with the provisions and policies of the McAteer-Petris Act, the Bay Plan, and the San Francisco Waterfront Special Area Plan.

Local Regulations

City and County of San Francisco Northeastern Waterfront Area Plan, Fisherman's Wharf Subarea

The general boundaries of the Fisherman's Wharf Subarea of the Northeastern Waterfront Area Plan are from Van Ness Avenue/Aquatic Park Cove east to Pier 35 and from Bay Street north to the Bay. Other subareas within the Northeastern Waterfront Area extend down to South Beach Harbor (San Francisco Planning Department 2003b). The Northeastern Waterfront Area Plan envisions an area where shipping-related maritime uses are maintained as long as they remain viable, commercial and recreation maritime operations continue, and fishing industry areas are expanded. For lands not used for maritime purposes, new projects will be mixed-use development, including open space and public access to increase public enjoyment of the waterfront areas. A strong sense of historical continuity and visibility of the natural features of the Bay are important to the identity of the area (San Francisco Planning Department 2003a).

Port of San Francisco Waterfront Land Use Plan

In 1968, the State of California transferred its responsibilities for the San Francisco waterfront to the City and County of San Francisco through the Burton Act. As a condition of the transfer, the State of California required the City and County of San Francisco to create a Port Commission that has the authority to manage the San Francisco waterfront for the citizens of California. The Port is responsible for 7.5 linear miles of waterfront and adjacent seawall lots stretching from Hyde Street Pier in the north to India Basin in the south. The Port's responsibilities include promoting commerce, navigation, and fisheries, water-related recreation, habitat preservation, and open space. The Port has jurisdiction over the Bay and waterfront lands in the vicinity of the Project Area and Pier 96.

In the Port's Waterfront Land Use Plan, the Fisherman's Wharf subarea includes the waterfront from Aquatic Park to Pier 39. Objectives include protecting the area as a working fishing port, maintaining a mix of maritime and water-based activities other than fishing, enhancing public access and open space, promoting a diverse mix of uses to make the area appealing to local residents and not just tourists, improving infrastructure to protect area businesses from sea level rise, and supporting a range of transportation options to and from the area (Port of San Francisco 2009).

In 2015, the Port began a comprehensive three-part public process to update Waterfront Plan (Port of San Francisco 2019); the draft plan is undergoing public review and is expected to be complete by 2022. Components relevant to the Fisherman's Wharf area include investing in infrastructure improvements that maintain public safety and economic vitality; adapting to sea level rise; and managing transportation to maintain viable industrial and loading access for fishing industry and commercial businesses, reduce single-occupant vehicle use, increase public transit service levels, enhance the pedestrian and bicycle experience, and support efficient parking operations.

The Southern Waterfront subarea extends from Pier 70 to India Basin, including Piers 94 and 96. This subarea is currently used for most of the Port's non-container general cargo operations and maritime public trust uses. The Waterfront Plan promotes expansion of cargo and maritime support uses (Port of San Francisco 2009). The draft plan update (Port of San Francisco 2019) seeks to improve and enhance Blue Greenway open space and public access areas that do not compromise maritime operations or sensitive environmental habitat areas, and provide education to promote public safety among maritime, small boating, and recreational water users. For the In the Pier 90–94 Backlands, the draft plan promotes pursuit of industrial warehouse facilities that are compatible with cargo terminal operations and provide maritime support uses, generate economic value and benefits to the Port and community, and productively improve land to support a stable industrial base in San Francisco.

Other Plans and Policies

Bay Plan. BCDC has jurisdiction over the Bay and the shoreline band of land extending inland for 100 feet from the Bay. BCDC developed the Bay Plan, which includes policies to guide future uses of the Bay and shoreline to protect and preserve the environment of the Bay (BCDC 2020).

San Francisco Waterfront Special Area Plan. This plan combines the objectives of the Bay Plan and the Port's Waterfront Land Use Plan to focus on the northeast waterfront area. It promotes sustainable development to "for attaining economic, environmental, and social goals" (BCDC 2012).

City of Oakland General Plan The City of Oakland's General Plan designates zoning and land use, including the area where Berth 10 is located in the Port of Oakland (City of Oakland 1998).

Blue Greenway Planning and Design Guidelines. The Port developed the Blue Greenway Planning and Design Guidelines to facilitate the planning and creation of the Blue Greenway, a proposed public open space and water access network in southeast San Francisco (Port of San Francisco 2012). The trail includes Cargo Way adjacent to the Pier 96 terminal, but would not conflict with materials handling activities.

BCDC Environmental Justice Policy. BCDC recently updated policies to incorporate consideration of environmental justice as a part of project permitting requests (BCDC 2019). Applications are now required to incorporate meaningful community involvement, identify disproportionate impacts, and use inclusive design principles in the evaluation of public access projects. The updated policies also require that the best available science on sea level rise, storm surge, and associated groundwater level changes be used in contamination remediation projects.

Evaluation of Environmental Effects:

a. Physically divide an established community? **(*No Impact*)**

The Project Area is located mostly in submerged areas of the Bay, and the upland areas of the proposed MHFs are in industrial areas. Project activities would involve site remediation. Therefore, implementation of the Project would not divide established communities.

b. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect? **(*Less Than Significant Impact*)**

There would be no change in land use, and the Project activities both in-water at the Project Area and at the MHF would be consistent with Port of San Francisco Waterfront Land Use Plan goals for the area. The Project would not conflict with the Blue Greenway Planning and Design Guidelines, as activities at the MHF would not involve any work on Cargo Way. Berth 10 is used solely as an MHF and therefore Project activities would not cause conflicts with applicable land use plans.

The Project complies with BCDC environmental justice policy requirements, as they relate to land use planning. The Project uses the best available science on sea level rise, storm surge, and associated groundwater level changes, where applicable (for more information see the hydrology and water quality impact analysis in Section 5.10). The Project would meet public access design and signage requirements by posting multi-lingual signs informing people of any temporary changes to recreational uses (fishing access, boating), and ensuring all accessible walkways and thoroughfares remain available to all who rely on them (people with disabilities, people who rely on non-automotive transit as their primary means of transportation) or are restored to original condition following Project implementation. The Project would encourage meaningful community involvement by announcing the public comment period and any public meetings (if applicable), posting these announcements in multiple languages (Mandarin, Spanish, and English), and making the announcements available online. By addressing all public comments and concerns, the Project would ensure that community concerns are considered and that the public's contribution can influence the decision-making process. Disproportionate impacts on communities of color and low-income communities would be avoided by incorporating pollution prevention practices and policies to reduce the intensity and size of impacts (for more information see the air quality and transportation analyses in Sections 5.3 and 5.17, respectively). The Project would ensure additional long-term benefits to the community by remediating impacted sediments.

The remedy for the Project was designed to allow continued uses and ensure that current and planned navigation and operational needs are met. Figure 3-1 shows the boundaries and elevations that would need to be maintained (i.e., anticipated future dredge area footprints and depths) based on current and planned navigation and operational needs. The Port recently applied for renewal of its operational maintenance dredge permits to reflect these updated footprints and depths, referred to as OULs, although tenants will ultimately be responsible for obtaining dredging permits and approvals. The Project design considers the current and future OULs, and minimizes impairment to beneficial uses of the waterway to ensure that tenant operation requirements can be met within each remedial response area. However, the cap placement would limit future dredging depths, and ICs implemented as part of the remedy (e.g., restrictions on the use of anchors or other activities that could disturb sediments in select areas, speed restrictions, limits on future maintenance dredging in addition to current dredging, and limitations and existing restrictions on Port tenants and mariners) could affect future tenants' use of the Project Area. For example, if a future tenant in the Project Area wanted deeper berths than is required for current navigation and operational needs, the cap would have to be removed and a new remedy implemented.

A Post-construction Risk Management and Monitoring Plan (described in Attachment A), which requires review and approval by the Port, would describe ICs (e.g., restrictions on the use of anchors in select areas, creation of no-wake zones, and limits to future maintenance dredging beyond the currently anticipated OULs), long-term monitoring, and management activities to maintain remedy elements as well as requirements for conducting intrusive activities in the future.

There may be future, minor conflicts with the Port's Waterfront Land Use Plan because ICs may restrict or limit some uses of the Project Area. Review and permitting by BCDC to ensure compliance with the regulations listed above, along with compliance with the Bay Plan, would ensure that impacts related to applicable land use plans, policies, and regulations would be less than significant.

References:

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6. Port of San Francisco. 2009. Waterfront Land Use Plan, Revised version, October 2009. Accessed at: https://sfport.com/waterfront-land-use-plan-chapters
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10. San Francisco Planning Department. 2003b. Northeastern Waterfront Area Plan Map. Accessed at: https://generalplan.sfplanning.org/images/northeast_waterfront/new_map1.pdf.

11. San Francisco Planning. 2020. Zoning Use Districts Map. Accessed at: https://sfplanninggis.s3.amazonaws.com/hub/BIGmap.pdf.

5.12 Mineral Resources

Would the project:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	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?	☐	☐	☐	☒
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?	☐	☐	☒	☐

Project Activities Likely to Create an Effect:

- In-water construction activities (e.g., debris removal, dredging, pile driving/removal, and capping/armor placement)

Existing Environmental Conditions:

The Project Area is entirely located within the Bay. The MHF sites are in industrial, urbanized areas of San Francisco (Pier 96) or Oakland (Berth 10). Sediment to be removed from the Bay is dominantly silt with varying amounts of sand and clay, consistent with the ubiquitous bay mud found throughout the Bay. The sediment at the mudline is generally soft with a large percentage of water content; however, with depth (approximately 2 to 3 feet below mudline), the sediment is more consolidated. Debris to be removed from the Project Area mostly consists of old wooden piers from the former Pier 43. The MHFs are entirely paved industrial docks with no bare earth or mineral resources present.

Candidate capping material types would likely include bay mud, sand/aggregate, and riprap. Potential borrow sources for the selected capping material may include other local dredging projects, mined sand, and upland sources (Haley & Aldrich 2021). Sand and gravel usable for aggregate most commonly occur in flat valley floors where former streams have deposited their upland load. Sand deposits can be found beneath the waters of the Bay. Some of these deposits are too muddy or fine to be used, but others contain coarser material (Bailey and Harden 1975).

In 2015, Hanson Aggregates was issued a permit to mine up to 1,540,000 cy of sand annually between 2015 and 2025 from a 2,601-acre area of submerged lands leased from the California State Lands Commission in the central Bay near the Project Area (Department of the Army 2015). Two other sand mining lease areas are located in the region, in Suisun Channel. Permits for these areas were issued to Lind Marine and Suisun Associates, a joint venture between Lind Marine and Hanson Aggregates (BCDC 2021).

Due to its urban nature, other minerals are not found in San Francisco to any appreciable extent (San Francisco Planning Department 2004).

Regulatory Framework:

McAteer-Petris Act

The McAteer-Petris Act of 1965 (California General Code Section 66600 et seq.), as amended, directs the BCDC to exercise its authority to issue or deny permit applications for placing fill, extracting materials, or changing the use of any land, water, or structure within the area of its jurisdiction, in conformity with the provisions and policies of both the McAteer-Petris Act and the Bay Plan. The USACE issues sand mining permits for the Bay that need approval by BCDC.

Department of Toxic Substances Control

DTSC provides guidance regarding how to identify clean imported fill material to avoid introducing inappropriate fill material to sensitive land use (DTSC 2001). The guidelines also specify the appropriate types of analyses that should be performed relative to the former land use, and the number of samples that should be collected and analyzed based on the estimated volume of fill material that will need to be used.

Evaluation of Environmental Effects:

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? **(*No Impact*)**

The Project would include the removal of approximately 88,000 cy of sediment and debris, which are not a mineral resource of value. This sediment and debris are not in an area used for permitted mining of sand and gravel from the Bay, and there are no known mineral resources in the Project Area (Kohler-Antablin 1996). Therefore, the Project would not result in a loss of availability of a known mineral resource of value.

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? **(*Less Than Significant Impact*)**

The Project Area is not located in or near a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. The quantity of backfill material (e.g., sand, reactive material, riprap) would contribute to the projected total 51,500 cy needed, however no single material quantity is expected to deplete local sources. The use of this material as backfill would be consistent with applicable permits and regulations. Therefore, the Project will have no impact on reducing the availability of local mineral resources.

References:

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5. Haley & Aldrich. 2021. Feasibility Study/Remedial Action Plan, Piers 39 to 45 Sediment Investigation Area, San Francisco, California. File No. 128154-016. September 2021. Prepared for Pacific Gas and Electric Company, San Ramon, CA. Haley & Aldrich, Inc., Oakland, CA.

6. Kohler-Antablin, S. 1996. Update of Mineral Land Classification: Aggregate Materials in the South San Francisco Bay Production-Consumption Region. Division of Mines and Geology Open-File Report 96-03. California Department of Conservation, Division of Mines and Geology.

7. San Francisco Planning Department. 2004. San Francisco General Plan, Environmental Protection Element (Last amended 12/2/2004). Accessed at: https://generalplan.sfplanning.org/I6_Environmental_Protection.htm.

5.13 Noise

Would the project result in:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b. Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Project Activities Likely to Create an Impact:

- In-water construction activities (e.g., debris removal, dredging, pile driving/removal, capping/armor placement, and slope stabilization)
- Material handling
- Transportation of materials to and from the MHF and staging areas

Existing Environmental Conditions:

The existing ambient noise environment in the area surrounding the Project Area is typical of most urban areas and is dominated by pedestrian traffic, visitor-related commercial developments, and vehicular traffic on local roadways. The Pier 96 MHF and staging area vicinity is an industrial site with maritime uses, with some residential uses nearby. Berth 10 is in a similar type of area in Oakland.

SFDPH has mapped transportation noise throughout the city based on modeled traffic volumes derived from the San Francisco County Transportation Authority (SFCTA) travel demand model, as shown in Figure 5-13.1 (San Francisco Planning Department 2009).

The noise levels are expressed in A-weighted decibels (dBA) as day-night average sound levels (Ldn), which describe a receiver’s cumulative noise exposure from all events over a full 24 hours; events between 10:00 p.m. and 7:00 a.m. are increased by 10 decibels to account for greater nighttime sensitivity to noise. The SFDPH map indicates that the existing noise levels near the Project Area and MHF are generally 50 to 60 dBA Ldn and generally exceed 70 dBA along the nearby roadways. However, because SFDPH accounts only for noise from transportation sources, existing daytime noise in the area would be expected to exceed these levels due to the many commercial and maritime industrial land uses in the Project Area and at the MHF, which produce noise from non-transportation sources.

Sensitive receptors for noise impacts are generally considered to include hospitals, nursing homes, senior citizen centers, schools, churches, libraries, and residences.

Project Area Noise Conditions

Ambient noise levels near the Project Area are typical of noise levels found in San Francisco, which are dominated by vehicular traffic, including cars, trucks, San Francisco Municipal Railway (Muni) buses, and emergency vehicles. As shown in Figure 5-13.1, noise from transportation sources is generally 50 to 60 dBA Ldn at ground level locations. In addition, the Project Area is adjacent to The Embarcadero, a street that is heavily dominated by commercial and visitor and tourist traffic and adjoins properties zoned for public and commercial use (San Francisco Planning Department 2020). Noise from transportation sources along The Embarcadero is in excess of 70 dBA. The Project Area also has public-oriented maritime services such as cruises, excursions, and ferry and water taxis (Port of San Francisco 2009). In addition, there are surrounding commercial fishing operations and other working maritime operations (which periodically require maintenance dredging and other activities using barges and heavy equipment).

There are no sensitive land uses (e.g., hospitals, schools, daycares, nursing homes) within ¼ mile of the Project Area. There are no residences immediately adjoining the Project Area, but there are hotels adjacent to the Project Area and apartment buildings within three blocks.

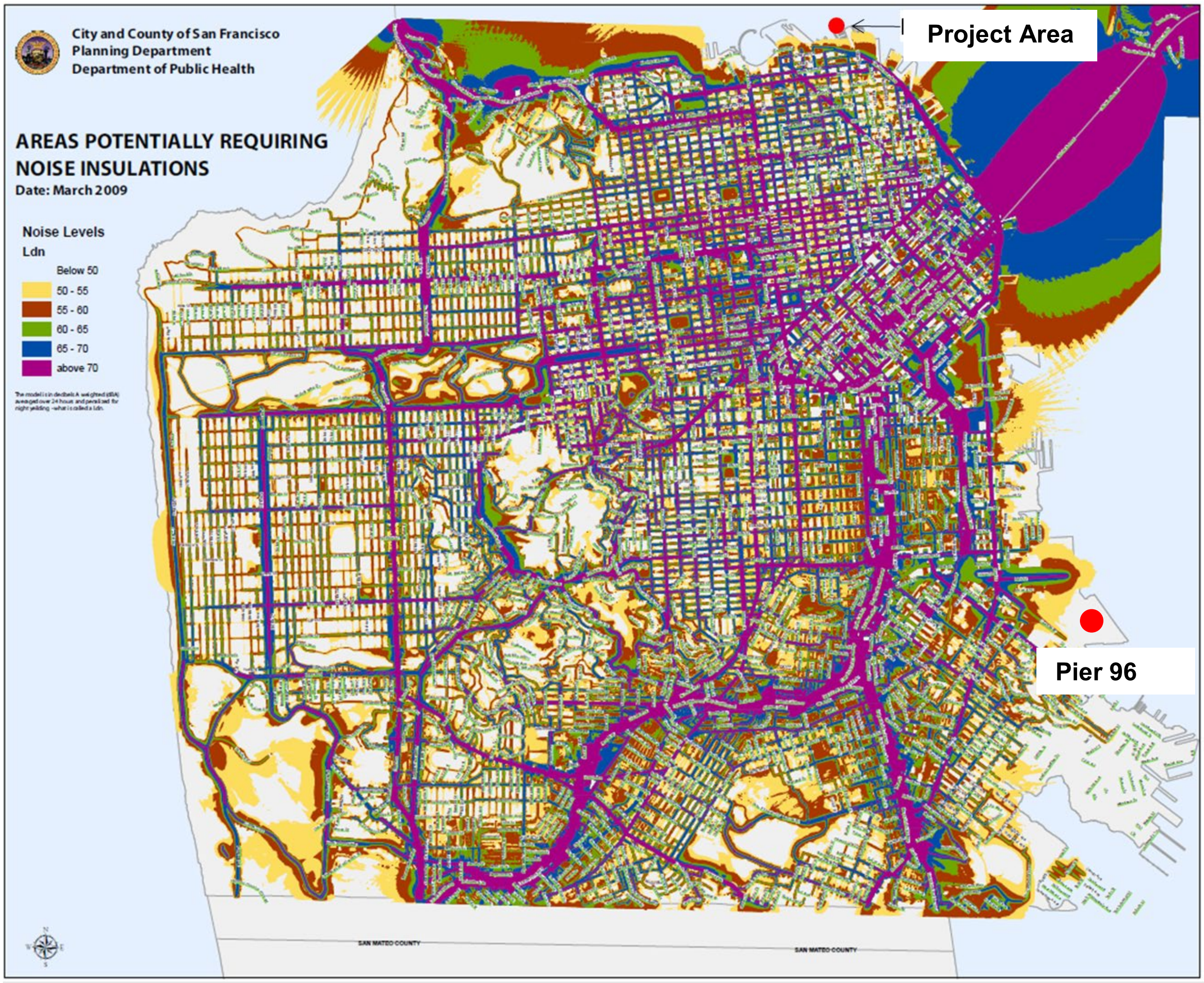

Figure 5-13.1. San Francisco Noise Contours from Transportation Sources

Pier 96 Noise Conditions

Ambient noise levels near the MHF are typical of noise levels found in San Francisco, which are dominated by vehicular traffic, including cars, trucks, Muni buses, and emergency vehicles. As shown in Figure 5-13.1, noise from transportation sources is generally 50 to 60 dBA Ldn at ground-level locations. Noise from transportation sources along the roadways near the MHF area is in excess of 70 dBA. The Pier 96 area is zoned for production, distribution, and repair uses (San Francisco Planning Department 2020). In addition, the Pier 96 area is part of the Port's Southern Waterfront, which remains the home of the Port's cargo shipping and heavy industrial maritime operations (Port of San Francisco 2009).

The closest residential properties are about 0.5 mile to the southwest from Pier 96 off of Keith Street and Middle Point Road. The Bayview neighborhood spreads out to the southwest beyond this point, with many residential properties within 1 mile of Pier 96. Rise University Preparatory (an independent Christian middle and high school) is the closest school, located about 0.7 mile to the southwest from Pier 96 off of Evans Avenue. Additional schools within a 1-mile radius include the main location of Rise University Preparatory on Galvez Avenue, KIPP Bayview Elementary, KIPP San Francisco College Preparatory, and the Evans Center (part of City College of San Francisco). There are also one daycare (Ideal Daycare on La Salle Avenue), and a few assisted living centers (CCHNC

Providence Senior Housing, Northridge Cooperative, and Providence Senior Housing) within a 1-mile radius. However, none of these uses is located along the haul route to landfills, between Pier 96, US 101, and Interstate 280.

Berth 10 Noise Conditions

Ambient noise levels at Berth 10 are typical of noise levels in areas dominated by industrial uses. Noise level estimates are not available for the Berth 10 area, but because it has similar uses as Pier 96 (cargo shipping and heavy industrial maritime operations) noise levels are expected to be similar to those at Pier 96.

The nearest residential properties are the Station House Oakland Condos on Frontage Road between 16th and 14th Streets, about 0.7 mile to the southeast of Berth 10. A large residential area spreads out to the southeast past Station House, bounded by Interstate 880 to the south/southeast. There are no daycare centers, schools, or nursing homes within a 1-mile radius, including along the haul route from Berth 10 to Interstate 880.

Regulatory Framework:

Federal and State Regulations

There are no federal or state regulations that address noise impacts associated with the Project.

Local Regulations

San Francisco Noise Ordinance

In San Francisco, construction noise is regulated by the San Francisco Noise Ordinance, Article 29 of the Police Code (Regulation of Noise), which states that the City and County of San Francisco's policy is to prohibit unnecessary, excessive, and offensive noises from all sources subject to police power (SFDPH 2014). Sections 2907 and 2908 of Article 29 regulate construction equipment and construction work at night. Sections 2907 and 2908 are enforced by the Department of Building Inspection and Department of Public Works. In addition, the Port Building Inspector may grant variances to noise regulations, over which the Port has jurisdiction.

Section 2907 applies to noise generated by any construction equipment on a permitted construction, except for impact tools such as jackhammers. The sound from powered construction equipment may not exceed 80 dBA when measured at a distance of 100 feet from the equipment or 100 feet from the construction site boundary.

Section 2908 generally prohibits construction work between 8:00 p.m. and 7:00 a.m. if noise is likely to exceed the ambient noise level by 5 dBA at the construction site boundary. For in-water work being performed between the hours of 8:00 p.m. and 7:00 a.m., a San Francisco Night Noise Authorization Permit can be obtained from the Port's Building Permit Group. The contractor is required to provide a minimum of 72 hours advance notice to residents and affected neighbors for night noise authorization.

San Francisco General Plan Environmental Protection Element

The Environmental Protection Element of the San Francisco General Plan addresses the impact of urbanization including the use of oil and gas resources and hazardous waste on the natural environment. Noise plans and policies related to environmental protection are generally designed to achieve an environment in which noise levels will not interfere with the health and welfare of people in their everyday activities. The following policies are applicable to noise from transportation sources that could be affected by the Project:

- Policy 9.1: Enforce noise emission standards for vehicles.
- Policy 10.2: Promote the incorporation of noise insulation materials in new construction.
- Policy 11.1: Discourage new uses in areas in which the noise level exceeds the noise compatibility guidelines for that use.

The Environmental Protection Element also contains land use compatibility guidelines for community noise. These guidelines establish acceptable noise levels for various types of land uses. The maximum “satisfactory” noise level is 60 dBA Ldn for residential and hotel uses; 65 dBA Ldn for school classrooms, libraries, churches, and hospitals and nursing homes; 70 dBA Ldn for playgrounds, parks, office buildings, retail commercial uses, and noise-sensitive manufacturing/ communications uses; and 77 dBA Ldn for other commercial uses such as wholesale, some retail, industrial/manufacturing, transportation, communications, and utilities.

Evaluation of Environmental Effects:

a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? **(*Less Than Significant Impact*)**

Pile and debris removal and pile driving activities, dredging and capping/armoring, material handling, and transportation of materials to and from the MHF and staging areas would cause a temporary increase in noise levels at the Project Area and MHF and staging areas. Construction would potentially occur over a 5- to 10-year period in which each remedial response area would be constructed in phases. The magnitude of noise impacts during this period would depend on the type and size of equipment operated during a given construction phase, the duration of a given construction phase, the distance between the noise source(s) and the affected receptor(s), and the presence (or absence) of barriers. There are no residential receptors near the Project Area or MHF areas; however, there may be times when noise levels would interfere with businesses near the Project Area. Table 5-13.1 shows typical construction equipment noise emissions levels.

Table 5-13.1. Typical Noise Levels from Construction Equipment

Equipment	Typical Noise Level (dBA) at 50 Feet from the Source
Air Compressor	81
Backhoe	80
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	81
Jack Hammer	88
Loader	85
Pile-driver (Impact)	101
Pile-driver (Sonic)	96
Pump	76
Truck	88

Source: FTA (2006)

Project Area Noise Impacts

The noise generated by remedial activities is not expected to exceed the typical construction noise levels listed in Table 5-13.1. Remedial activities would generally occur in-water adjacent to the Project Area. Remediation activities such as pile and debris removal and pile driving, dredging, and cap/armoring could temporarily cause an increase in noise levels in the Project Area. Construction noise and possibly vibrations could be considered an annoyance by commercial businesses and visitors to nearby properties.

According to Section 2907 of San Francisco's Noise Ordinance, operation of any powered construction equipment (non-impact) is prohibited, regardless of age or date of acquisition, if the operation emits noise at a level in excess of 80 dBA when measured at a distance of 100 feet from such equipment. As shown in Table 5-13.1, equipment used for in-water activities may exceed the constraints of the Noise Ordinance and the San Francisco General Plan compatibility guidelines for community noise at 50 feet from the source. However, the majority of the work would be conducted more than 50 feet from shoreline areas. Areas where in-water work activities would take place within 50 feet of businesses along the shoreline would be (1) portions of Areas C and D near the Pier 41 wooden viewing pier, which could be closed for safety reasons for a short period, and along Pier 41½ and the docks north of The Embarcadero; and (2) small portions of Areas A, B, and E, those closest to the shoreline area. Noise levels would generally dissipate at a rate of 7 dBA for every 50 feet beyond the initial 50-foot distance from the work area. The Project is expected to operate within the noise levels specified in San Francisco's Noise Ordinance, except for pile drivers, which are exempt from this restriction (SFDPH 2014). In addition, given the existing uses near the Project Area, equipment needed for remedial activities would be compatible with the surrounding commercial fishing operations, ferry and excursion vessel operations, and other working maritime operations (which periodically require maintenance dredging and other activities using barges and heavy equipment).

Dredging activities may require extended hours to work around ferry and other vessel operations; those extended hours could include work between the hours of 7:00 p.m. and 8:00 a.m. The contractor would need to obtain a San Francisco Night Noise Authorization Permit from the Port's Building Permit Group. The Contractor is required to provide a minimum of 72 hours advance notice to residents and affected neighbors for night noise authorization. Because the Project Area is dominated by daytime uses (commercial, tourist, public-oriented maritime services) and residences are not located nearby, it is not expected that nighttime activities would affect commercial receptors near the Project Area.

The following control measures included in Attachment A would be implemented to reduce the potential for an increase in ambient noise during remediation activities, in alignment with levels specified in San Francisco's Noise Ordinance and the San Francisco General Plan:

1. To reduce potential impacts from noise due to pile-driving, the Project shall implement one or more of the following as needed:

- Use vibratory methods for installation of steel piles to the extent practicable
- Use cushion blocks between hammer and piles
- Implement a "soft start" technique.

2. To reduce potential impacts from noise due to impact hammers, the Project shall implement the following:

- Operate a single impact hammer at a time
- Implement a sound attenuation method for the duration of use, using 36-inch steel or 20-inch concrete.

In addition, a Sound Attenuation and Monitoring Plan would be implemented for the protection of marine mammals (see Section 5.4). This plan would include vibration limits for construction activities, methods to reduce vibrations where possible, and a noise mitigation plan that would further reduce groundborne vibrations and noise levels. With implementation of these plans, controls, and AMMs and requirements imposed through the permitting process, Project-related impacts on ambient noise levels in the Project Area would be less than significant, and the Project would not result in a substantial temporary or permanent increase in ambient noise levels in excess of standards established in the local general plan or noise ordinance.

Noise Impacts at Pier 96 or Berth 10

Noise would be generated by trucks transporting materials to the MHF and staging areas, activities associated with drying of sediments, hauling of dried sediments and debris to an offsite facility for disposal, and equipment usage. Given existing uses near the MHF and staging areas, equipment needed for remedial activities would be compatible with the surrounding working maritime operations and transporting facilities. These activities would involve a number of the equipment types listed in Table 5-13.1. Pile driving, if necessary, would be limited to activities at the dock face to reinforce the structure for offloading. Both the Pier 96 area and Berth 10 are located within maritime/commercial/industrial use areas, and the activities would take place more than 100 feet from surrounding uses. As discussed above, noise levels would generally dissipate at a rate of 7 dBA for every 50 feet beyond the initial 50-foot distance from the work area.

Trucks coming to and from the MHF and staging area are expected to have a typical noise level of 88 dBA 50 feet from a receptor. The maximum number of trucks per day entering and leaving the site is estimated to be 21 trucks (see Section 5.17). This impact would be short-term, and the truck traffic would not substantially increase the noise from transportation sources along the haul routes described in Section 5.17, Transportation, which generally exceeds 70 dBA in the Pier 96 area (Figure 5-13.1).

As shown in Table 5-13.1, equipment usage at the MHF and staging areas is expected to have a typical noise level ranging from 76 to 101 dBA. As the closest receptors are located 0.5 mile to the southwest of Pier 96, it is not expected that noise levels from equipment usage at the MHF and staging areas would affect receptors. Conditions are similar at Berth 10. Therefore, the noise generated from trucks transporting materials and sediments would not result in a noticeable increase beyond ambient conditions. The following plans, controls, and AMMs included in Attachment A would be implemented to reduce the potential for an increase in ambient noise:

- Waste Management and Transportation Plan (e.g., truck export and import tracking procedures, transportation routes, onsite signage requirements, estimated daily quantity and schedule for trucks)Noise Control Measures (see above)
- Dust, Vapor and Odor Control Measures (specifically, idling times would be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes).

With implementation of these plans, controls, and AMMs, Project-related impacts on ambient noise levels in the MHF and staging areas would be less than significant; the Project and not result in a substantial temporary or permanent increase in ambient noise levels in excess of standards established in the local general plan or noise ordinance.

b. Generation of excessive groundborne vibration or groundborne noise levels? **(*Less Than Significant Impact*)**

Implementation of the Project would not be expected to result in substantial vibration impact. In general, vibratory methods would be used to remove and install piles in the Project Area. Due to the soft sediment in the Project Area where the work would be conducted, the vibrations would be expected to dissipate to below discernible levels well before reaching any receptor locations.

Impact hammers may be used to install sheet piles, mainly at the MHF. However, because the MHF would be constructed in the first year, this activity is likely to take place during the first few weeks of staging and mobilization activities for the Project. As noted above, there are no residential receptors near the MHF area, and the compliance and monitoring plans and control measures outlined below would be implemented to reduce vibrations.

Impact hammers may also be used within the Project Area to install piles to promote slope stabilization. Permanent piles would be installed vertically to a depth of approximately 50 feet below the dredge surface elevation, in a uniform array across the face of select dredge slopes. Up to 1,200 piles may be necessary to promote slope stability across the duration of the Project work. Piles would be installed at a rate of approximately 3.5 piles per day. The duration of pile installation would be approximately 20 minutes per pile. Due to the short duration of each pile installation, vibrations would be expected to dissipate below discernible levels. In addition, the impact hammer type will be determined based on the proximity to sensitive areas or structures and soil type. For the protection of nearby structures, vibration monitoring limits will be defined based on criteria presented from the United States Bureau of Mines (1989), wherein the criteria are such that measured values (typically from vibration monitors placed near the Project Area) are limited to being below the green line, as shown in Figure 5.13-2. As noted above, there are no sensitive land uses near the Project Area and no adjacent residences. The compliance and monitoring plans, specifically the Geotechnical Instrumentation and Monitoring Plan, and control measures outlined below would be implemented to reduce vibrations.

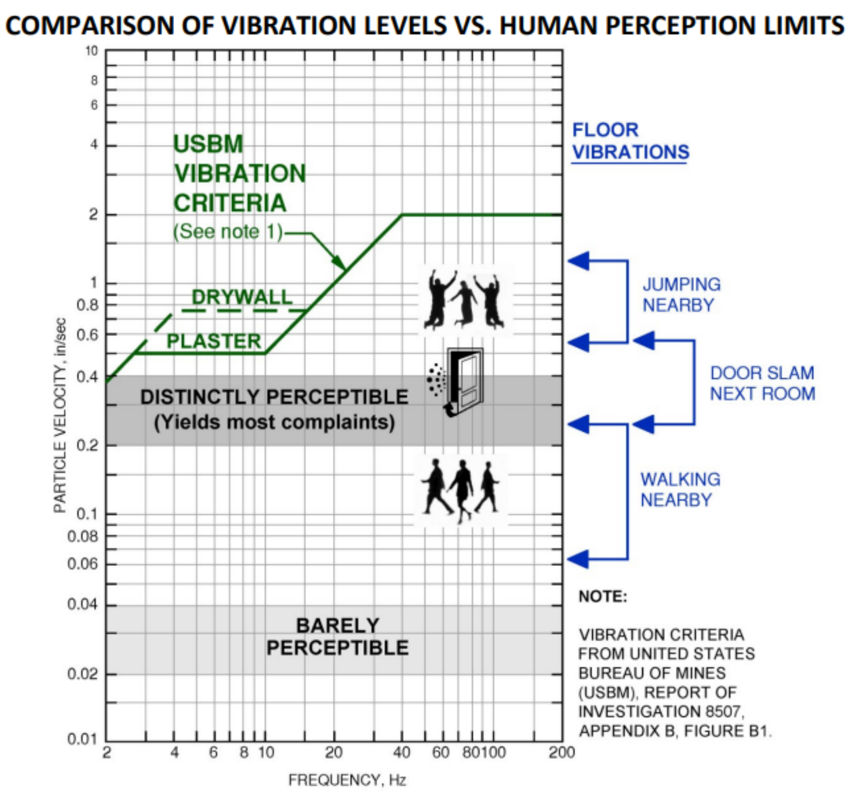

Figure 5-13.2. Comparison of Vibration Levels vs. Human Perception Limits

In the upland work areas (MHF, staging area, and roadways), trucks and other mobile equipment would not be expected to generate significant vibrations. Trucks rarely create vibration that exceeds 70 dBA unless there are bumps in the road (FTA 2006).

The following plans, controls, and AMMs included in Attachment A would be implemented to reduce groundborne vibrations and noise levels:

- Geotechnical Instrumentation and Monitoring Plan (e.g., vibration and potential movement limits, methods to reduce vibrations, survey and monitoring reference points)
- Waste Management and Transportation Plan (e.g., truck export and import tracking procedures, transportation routes, onsite signage requirements, estimated daily quantity and schedule for trucks)
- Noise Control Measures, specifically:

  1. To reduce potential impacts from noise due to pile-driving, the Project shall implement one or more of the following as needed:

     - Use vibratory methods for installation of steel piles to the extent practicable
     - Use cushion blocks between hammer and piles
     - Implement a “soft start” technique

  2. To reduce potential impacts from noise due to impact hammers, the Project shall implement the following:

     - Operate a single impact hammer at a time
     - Implement a sound attenuation method for the duration of use, using 36-inch steel or 20-inch concrete

In addition, as noted in section (a), a Sound Attenuation and Monitoring Plan would be implemented for the protection of marine mammals (see Section 5.4), and would include vibration limits for construction activities, methods to reduce vibrations where possible, and a noise mitigation plan, which would further reduce groundborne vibrations and noise levels. With implementation of these plans, controls, and AMMs, generation of Project-related groundborne vibration and noise levels would be less than significant.

c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? **(*No Impact*)**

The Project would not be located within the vicinity of a private airstrip or a public airport, and therefore would have no impact.

References:

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4. San Francisco Planning. 2009. Map 1. Background Noise Levels – 2009. Available at: https://generalplan.sfplanning.org/images/I6.environmental/ENV_Map1_Background_Noise%20Levels.pdf. San Francisco Planning.
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6. SFDPH. 2014. San Francisco Police Code Article 29: Regulation of Noise Guidelines for Noise Control Ordinance Monitoring and Enforcement. Available at: https://www.sfdph.org/dph/files/EHSdocs/ehsNoise/GuidelinesNoiseEnforcement.pdf. San Francisco Department of Public Health.
7. United States Bureau of Mines. 1989. Report of Investigation 8507: Structure Response and Damage Produced by Ground Vibration from Surface Mine Blasting. Available at: https://www.osmre.gov/resources/blasting/docs/USBM/RI8507BlastingVibration1989.pdf.

5.14 Population and Housing

Would the project:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	☐	☐	☐	☒
b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Project Activities Likely to Create an Effect:

None.

Existing Environmental Conditions:

At this time, there are no current or planned residential units in the Project Area or the MHF areas. The Project Area includes fishing vessel and ferry docks, and a high concentration of visitor-related commercial development (shops and restaurants). The MHF sites are located in industrial areas specifically zoned for continued industrial maritime and cargo activities.

Regulatory Framework:

There are no regulations related to population and housing that would be applicable to the Project.

Evaluation of Environmental Effects:

a. Induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)? ***(No Impact)***

Project activities would be focused on in-water remediation of Bay sediments and would not involve any activities that would directly or indirectly induce population growth. Therefore, the Project would have not induce population growth.

b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? (***No Impact***)

No displacement of housing or people would occur as a result of sediment and debris removal or handling activities. Project activities would be focused on in-water remediation of Bay sediment and would not involve the displacement or construction of any existing housing.

5.15 Public Services

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered government 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 following public services:				
Fire Protection?	☐	☐	☐	☒
Police Protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Other Public Facilities?	☐	☐	☐	☒

Project Activities Likely to Create an Effect:

None.

Existing Environmental Conditions:

The Project Area and MHF areas are located in regions that are currently served by fire, police, and paramedic services. There are no schools or other government facilities in the uplands directly adjacent to Piers 39 to 43½ or at the MHFs.

Regulatory Framework:

There are no regulations related to public services that would be applicable to the Project.

Evaluation of Environmental Effects:

a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered government 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 following public services: Fire protection, police, schools, parks, other public facilities? **(*No Impact*)**

It is not anticipated that the sediment and debris removal or handling activities would increase the number of police and fire protection-related calls received from the area or the level of regulatory oversight that must be provided as a result of the work. Overall, the Project would not create additional demand. Therefore, there would be no impact on public services in San Francisco or Oakland.

5.16 Recreation

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☒	☐	☐

Project Activities Likely to Create an Effect:

- Relocation of floating docks
- In-water construction activities (e.g., debris removal, dredging, pile driving/removal, and capping/armor placement)

Existing Environmental Conditions:

The Project Area and potential MHF locations (the Pier 96 area and Berth 10) are in developed urban and industrial areas of San Francisco and Oakland that do not contain large regional park facilities but do include a number of neighborhood parks and open spaces, as well as other recreational facilities. Existing parks adjacent to the Project Area include a string of open grass areas between The Embarcadero and the Bay from Piers 35 to 43. In the Pier 96 area, Heron's Head Park is located just south of Pier 96. The piers adjacent to the Project Area between Piers 39 and 43½ host a variety of recreational opportunities and businesses that are very popular with tourists, summarized by area below.

Pier 39

Pier 39 is a 45-acre waterfront complex that hosts about 15 million visitors annually. It opened in 1987 and currently houses 14 full-service restaurants, 90+ shops, and attractions including the Aquarium of the Bay, a 5-acre waterfront park, and a 300-berth marina.

Pier 39 West Basin

The West Basin hosts guest docking and accommodates boats up to 60 feet. It is closed in the winter months (December to March). There are a small number of liveaboard boat residents as well.

The Blue & Gold Fleet operates two regular cruise routes, with additional cruises for holiday and private events added occasionally. Bay cruises depart from the Pier 39 Marina West Basin. The Bay cruise is a 60-minute cruise around the Bay, and "Escape from the Rock" is a 90-minute cruise that takes visitors around Alcatraz Island and back to Pier 39 West. Boat capacity ranges from 300 to 787 passengers. July and August are the busiest months for excursions, with June, September, and October also relatively busy.

J Dock is home to seasonal commercial business including Adventure Cats, a charter sailing company that offers sailing trips as well as private charters. May to September is the busy season, and there are no daily sailing trips between the end of November and mid-February.

San Francisco Bay Boat Cruises is based out of I Dock and offers wine tasting tours and other excursions.

Pier 39 East Basin

The Marina’s East Basin consists of Docks A through F. It is used for long-term and transient tenant boat slips, accommodating boats up to 85 feet. There are a small number of liveaboard boat residents as well.

A Dock houses San Francisco Whale Tours and Empress Events luxury charter cruises. The whale tours are offered year-round and consist of 2½-hour tours plus special tours for New Year’s Eve and Fourth of July. Empress Events hosts up to 150 people on luxury yachts. The easternmost slips at A Dock houses the America’s Cup sailboat, which offers public and private charters from February through November.

A water taxi concession handles passengers throughout the day from B Dock.

B and C Docks hosts Emerald Lady and Bay voyager excursions. They operate year-round if possible, depending on weather.

San Francisco Sailing Company is a sailing school and charter company with numerous boats operating year-round out of F Dock. It offers up to five sailing trips per day in addition to private charters and classes.

Pier 43½

Operating from Pier 43½ in the western portion of the Project Area, the Red and White Fleet provides sightseeing Bay cruises with several daily departures on vessels that average a 400-passenger carrying capacity. They offer a 60-minute cruise out to the Golden Gate Bridge and around Alcatraz Island, a 90-minute “Bridge to Bridge” cruise that is similar to the Golden Gate cruise but travels farther south to the Bay Bridge, and during limited time, a twilight cruise. Special event cruises (e.g., Fourth of July) and private cruises are offered as well. Both landside and waterside renovation plans are under way for the Red and White Fleet area, as described below.

San Francisco Bay Trail

The San Francisco Bay Trail is a bicycle and pedestrian trail that will eventually allow continuous travel around the shoreline of San Francisco. The sections near the Project Area include bicycle lanes on The Embarcadero near Piers 39 to 43½. Trail sections are also located on Cargo Way near Pier 96, and on Maritime Street near Berth 10.

Regulatory Framework:

Blue Greenway Planning and Design Guidelines

The Port developed the Blue Greenway Planning and Design Guidelines to facilitate the planning and creation of the Blue Greenway, a proposed public open space and water access network in southeast San Francisco (Port of San Francisco 2012).

San Francisco General Plan

The **Commerce and Industry Element** of the San Francisco General Plan calls for managing economic growth to ensure enhancement of the total city environment, maintaining a diverse economic base, and providing employment opportunities for city residents. Objectives and policies relevant to recreation include:

- Objective 5—Realize San Francisco’s full maritime potential
- Policy 4.7—Improve public and private transportation to and from industrial areas

- Policy 5.8—Encourage maritime activity which complements visitor activity and resident recreation. (San Francisco Planning 2010).

The objectives of the **Recreation and Open Space Element** include ensuring an integrated open space system, increasing recreation and open space, improving access to open space, protecting biodiversity, engaging communities in stewardship, and securing long-term resource management for open space acquisition in San Francisco (San Francisco Planning Department 2014).

Port of San Francisco Waterfront Plan

The Port's Waterfront Plan includes a goal to complete, enhance, and enliven the network of parks, public access, and natural areas along the San Francisco waterfront and Bay shoreline for everyone to use and enjoy. The Fisherman's Wharf Area Plan (which encompasses Piers 39 to 43½) includes an objective to enhance the public access experience and open space programming, along with the following objectives related to recreation (Port of San Francisco 2009):

- To continue existing, and promote new and expanded, ferry, excursion boat and water-taxi operations, including new berths and landing facilities, if necessary
- To Increase ferry and water taxi ridership.

In 2015, the Port began a comprehensive three-part public process to update Waterfront Plan (Port of San Francisco 2019); the draft plan is undergoing public review and is expected to be complete by 2022. For the Fisherman's Wharf area, the draft plan includes a goal to enhance the pedestrian and bicycle experience and support efficient parking operations. For the Southern Waterfront, the draft plan seeks improve and enhance Blue Greenway open space and public access areas that do not compromise maritime operations or sensitive environmental habitat areas, and provide education to promote public safety among maritime, small boating, and recreational water users.

Evaluation of Environmental Effects:

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? **(*No Impact*)**

Implementation of the Project would not result in construction of residences or other land uses with demand for recreational facilities. The project would also not result in increased use of nearby neighborhood and regional parks because the facilities within the Project Area will remain open and accessible with the exception of possible short closures or access restrictions for small areas for safety considerations.

Existing vessels and operations used for recreation, primarily docked in the Pier 39 East Basin, will need to be temporarily relocated to an alternate marina (in San Francisco or elsewhere) for one to two construction seasons to accommodate the remediation activities. It is not expected that such relocations would result in any deterioration or undue burden on those marinas with open slips available to take in temporarily relocated vessels. The temporary and short-term nature of the relocations would neither warrant nor result in any development of additional facilities. Therefore, the Project would have not increase or result in deterioration of existing parks or recreational facilities.

b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment? **(*Less Than Significant Impact with Mitigation Incorporated*)**

The Project is not expected to increase the need for or expand recreational facilities or businesses located adjacent to the Project.

The Project would temporarily disrupt the current operation of several of the recreational businesses in the area of Piers 39 to 43½ to accommodate dredging equipment and other construction activities. The Project would include work in and around recreational facilities, as described above, but would not require the construction of new recreational facilities or expansion of existing recreational facilities. During remediation activities, some recreational vessels will need to relocate, as discussed in section (a) above, and s outdoor recreation businesses (e.g., excursion vessel operations) would either need to be temporarily relocated, continue on a modified schedule, or a combination of both.

For example, the Blue & Gold Fleet's busy months for cruise routes overlap with construction work windows for dredging and other Project work, so some reconfiguring of docks and schedules would likely be needed to coordinate construction and ferry trips. Details on the construction schedule, including possible interruptions or relocations necessary for existing recreational facilities would be developed during the remedial design and by the remediation contractor. The Project sponsor, the Port and the remediation contractor would be required to coordinate remediation activities and work with Port tenants to minimize impacts on recreational businesses. A portion of Pier 41, which is used by recreational fisherman, may also be closed during remediation in that area due to safety considerations, and access to some other pier/dock areas could be temporarily fenced off, also for safety reasons. Docks in the Pier 39 East Basin would also need to be temporarily relocated (in such a way that they would not be occupiable), and Pier 39 and recreational boaters will need to temporarily find other berthing locations.

As discussed in section (a) above, impacts on recreational boaters would be temporary and not result in any construction of expansion of recreational facilities. Recreational businesses, however, would need to use alternate docking locations, which could constitute an expansion of existing facilities. The following mitigation measure would be implemented to reduce Project-related impacts on recreational boating and businesses to less than significant.

Mitigation Measure REC-1

The Project sponsor/applicant (PG&E) and co-applicant (Port of San Francisco) shall coordinate with all relevant stakeholders (Red and White Fleet, Blue & Gold Fleet, and other recreational businesses affected by construction activities) to develop a plan to address impacts on recreational boating businesses as a result of construction activities. The plan shall discuss how stakeholders and contractors will coordinate and phase construction activities and/or find alternative options (e.g., temporary relocation of businesses, alternate berthing locations) to minimize impacts. In addition, the Project sponsor/applicant and co-applicant shall work with stakeholders to facilitate communication to the public of any changes to recreational business offerings and schedules in the Project Area well in advance of such changes.

References:

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3. Port of San Francisco. 2009. Waterfront Land Use Plan, Revised version, October 2009. Accessed at: https://sfport.com/waterfront-land-use-plan-chapters.

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6. San Francisco Planning Department. 2018a. Transportation Element. Last Amended 11/13/18. Accessed at: https://generalplan.sfplanning.org/I4_Transportation.htm.

7. San Francisco Planning Department. 2018b. Urban Design Element. Adopted 11/13/18. Accessed at: https://generalplan.sfplanning.org/I5_Urban_Design.htm.

5.17 Transportation

Would the project:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Conflict with program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☒	☐	☐
b. Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☒	☐
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
d. Result in inadequate emergency access?	☐	☐	☒	☐

Project Activities Likely to Create an Effect:

- Import of materials to Project Area
- Transportation of materials to and from the MHF and staging areas
- Trucking/transportation of dredged material and debris to landfills and other disposal facilities
- Transport of workers

Existing Environmental Conditions:

The transportation study area extends beyond the Project Area and includes the roadways, intersections, and ferry services that could be affected by the Project. Sediment and debris would be transported over water from the remedial response areas at Piers 39 to 43½ to the upland MHF or directly to sediment disposal sites (i.e., SF-DODS or a beneficial reuse site). Capping and armoring materials as well as other equipment and materials would be transported by truck to the MHF (which would include staging areas) and then over water to the Project Area as necessary.

Transportation impacts are primarily associated with activities at the MHF, including staging (i.e., material and equipment imports, worker trips), which is primarily anticipated to take place at the MHF that would be established within areas of the Port's Pier 96 maritime terminal. Drying of sediments and waste hauling are most likely to take place at Pier 96, or as an alternative option, at Berth 10 at the Port of Oakland. The Pier 96 area is assumed to be the preferred equipment staging area and MHF and is the primary area evaluated herein. Berth 10 is evaluated as a secondary location for material handling and waste hauling only. Equipment staging would be at the Pier 96 area or alternate locations (e.g., contractor facilities).

The discussion of existing environmental conditions below focuses on information relevant to potential transportation impacts near the MHF, with more limited information at the Piers 39 to 43½ area where transportation impacts are less likely and would mainly involve maritime activities.

Regional and Local Roadways

The transportation study area extends beyond the Project Area and includes the roadways, intersections, and ferry services that could be affected by upland Project activities. Material imports and workers would generally arrive at the Pier 96 area or another staging area (e.g., at the contractor's facility) to take boats or barges to the offshore in-water work area. Materials and equipment would also be exported from the MHF and staging areas.

The Pier 96 staging and MHF areas are served by the following two regional freeways:

- **US 101** runs north–south and has four travel lanes in each direction within the Pier 96 vicinity. Access to Pier 96 from and to US 101 is provided by on- and off-ramps at Cesar Chavez Street. The average daily traffic volume on US 101 is approximately 222,000 vehicles south of the interchange with Interstate 80.
- **Interstate 280** runs north–south and has three travel lanes in each direction within the Pier 96 vicinity. Access to Pier 96 from Interstate 280 northbound is provided via an off-ramp at Cesar Chavez Street. Access to Interstate 280 southbound is provided via on-ramps at 25th Street and Pennsylvania Avenue. The average daily traffic volume on Interstate 280 is approximately 114,000 vehicles north of the Pennsylvania Avenue/Indiana Street on- and off-ramps.

Local access is provided by the following arterial and local roadways in proximity to Pier 96:

- **Jennings Street** runs north–south and generally has one travel lane in each direction and intermittent on-street parking on both sides of the street.
- **Evans Avenue** runs southeast–northwest and generally has two travel lanes in each direction and intermittent on-street parking on both sides of the street. A striped bicycle lane (Class II facility) runs along Evans Avenue between Third Street and Jennings Street. A signed bicycle route (Class III facility) runs along Evans Avenue from Third Street to Cesar Chavez Street. In the San Francisco General Plan, Evans Avenue is designated as a Major Arterial in the Congestion Management Plan Network, a Metropolitan Transportation System street, a Citywide Pedestrian Network Street (on Evans Avenue between Third Street and Newhall Street), a Neighborhood Commercial Street, and a Freight Traffic Route (San Francisco Planning Department 2018).
- **Cesar Chavez Street** runs east–west and generally has two travel lanes in each direction and intermittent on-street parking on both sides of the street. A Class II bicycle route runs along Cesar Chavez Street between Evans Avenue and Kansas Street (before US 101). In the San Francisco General Plan, Cesar Chavez Street is designated as a Major Arterial in the Congestion Management Plan Network, an Metropolitan Transportation System street, and a Freight Traffic Route.

Existing mid-block counts and intersection turning movement counts were obtained from available data in the Congestion Management Plan (SFCTA 2017). In the vicinity of Pier 96, Cesar Chavez Street carries the highest volumes of traffic with approximately 3,538 and 3,659 vehicles (heading eastbound and westbound, respectively)[5] between York Street and Hampshire Street during the morning and afternoon peak hours, respectively. The intersection of Third Street and Evans Avenue carries approximately 3,857[6] vehicles during the peak morning hour.

Intersection level of service (LOS) for available intersections within the vicinity of the Pier 96 area was reported in the 2017 Congestion Management Plan during morning peak periods. Intersection LOS ranges from A, which indicates free flow conditions with short delays, to F, which indicates congested or overloaded conditions with extremely long delays. Table 5-17.1 presents the LOS for street segments during the afternoon peak hour under existing conditions. As shown in Table 5-17.1 all study intersections currently operate at acceptable service levels (LOS D or better) during the weekday afternoon peak hour under existing conditions.

Table 5-17.1. Recorded Afternoon Peak Hour Intersectional Level of Service at Street Segments near the Pier 96 MHF

Street Segment	LOS
Cesar Chavez Street (eastbound & westbound)	C
Evans Avenue (northbound)	D
Evans Avenue (southbound)	C

Source: SFCTA (2017)

Public Transit Conditions

The Pier 96 MHF area is served by Muni bus and light rail lines. Three Muni lines—the 19 Polk bus route, the 44 O'Shaughnessy bus route, and the T Third light rail line—operate near the Pier 96 MHF area.

The 19 Polk bus route provides weekday and weekend service to and from Hunters Point and Fisherman's Wharf through the Potrero Hill, South of Market, Polk Gulch, and Russian Hill neighborhoods. This bus route operates from 5:00 a.m. to midnight at 10-minute headways. The closest bus stop in proximity to the Pier 96 MHF is located on Evans Avenue and Middle Point Road, which is approximately a 10-minute walk from the Pier 96 MHF. This bus route also provides direct access to the Civic Center Muni Metro and Bay Area Rapid Transit (BART) stations (regional commuter rails).

The 44 O'Shaughnessy route provides weekday and weekend service to and from Hunters Point and the Richmond through the Portola, Glen Park, Forest Hill, Inner Sunset, and Inner Richmond neighborhoods. This bus route operates from 5:00 a.m. to midnight at 10-minute headways. "Owl All-Nighter" services are provided on a shortened route from Hunters Point to Glen Park. The closest bus stop in proximity to the Pier 96 MHF is located on Evans Avenue and Middle Point Road, which is approximately a 10-minute walk from the Pier 96 MHF. This bus route also provides direct access to the Glen Park BART station.

The T Third light rail line operates as a streetcar along the Bayshore Boulevard and Third Street corridors and along other major streets, including Fourth Street, King Street, and The Embarcadero (all located north of the Pier 96 area). In addition, this light rail line serves all Muni and BART stations along Market Street in downtown San Francisco and the Fourth Street Caltrain terminal. The T Third

[5] Mid-block counts were recorded for at least 3 days within a monitoring period.

[6] Turning movement counts were recorded on a single day.

line terminates at Sunnydale Station near the Bayshore Caltrain Station (regional rail passenger service). The closest stop to the Pier 96 MHF is at Third Street and Evans Avenue, which is an approximately 20-minute walk from the Pier 96 MHF. The T Third light rail line operates at 9- to 10-minute headways during weekdays and 10- to 12-minute headways during weekends.

Pedestrian Conditions

Pedestrian amenities generally include sidewalks, crosswalks, curb ramps, pedestrian signals, and streetscape and landscape amenities (e.g., benches, tree-lined buffers, planters, bulb-outs, street lighting). In the vicinity of the Pier 96 MHF, sidewalks are generally continuous, though painted crosswalks are not well established. The streets and sidewalks near the Pier 96 MHF are not included in the San Francisco General Plan Transportation Element, specifically the Citywide Pedestrian Network or Neighborhood Pedestrian Streets maps (San Francisco Planning Department 2018).

The Project Area is zoned for and has a high concentration of visitor-related commercial development, including more than 120 shops, and other visitor attractions, including a carousel, an aquarium, and a 300-boat public marina at Pier 39. Bay scenic cruise boats and ferry terminals and their supporting infrastructure are located on two piers within the Project Area. The streets and sidewalks along the Project Area are included in the San Francisco General Plan Transportation Element as a part of the Citywide Pedestrian Network (Bay, Ridge, and Coastal Trail) and the Neighborhood Pedestrian Streets maps as a Neighborhood Commercial Street (San Francisco Planning 2018).Table 5-17.2 presents the pedestrian counts for street segments taken near the Pier 96 MHF and Project Area during the morning peak hour under existing conditions.

Table 5-17.2. Pedestrian Counts for Street Segments near the Pier 96 MHF and Project Area

Street Segment	Morning	Afternoon
Third Street and Evans Avenue	150	185
The Embarcadero between Broadway and Washington Street[a]	2,740	2,697

Source: SFCTA (2017)

Notes:

[a]Numbers indicate counts of pedestrians heading in the northbound direction toward the Project Area. The average daily count for this street segment is 21,112 pedestrians.

Bicycling Conditions

Bicycle facilities within the San Francisco Bicycle Network include exclusive bikeway/bike paths (Class I facilities), striped bike lanes (Class II facilities), and signed bike routes (Class III facilities) (San Francisco Planning Department 2018).[7] Bike paths are paved trails that are separated from the roadways. Bike lanes are lanes on roadways designated for bicycle use by striping, pavement legends, and signs. Bike routes are roadways that are designated for bicycle use with signs.

There are no Class I facilities near the Pier 96 MHF. There are two designated bicycle routes in the vicinity of the Pier 96 MHF: Bicycle Routes 60 and 68. Bicycle Route 60 is a Class II (on-street facility) that runs along Cesar Chavez Street between Evans Avenue and Kansas Street (before US 101). Bicycle Route 68 is a Class II facility along Evans Avenue between Cesar Chavez Street and Third Street and a Class III facility (shared lane) between Third Street and Jennings Street.
Table 5-17.3 presents bicycle counts for street segments taken near the Pier 96 MHF. Bicycle counts

[7] Bicycle facilities are defined by the State of California in California Streets and Highways Code Section 890.4.

are generally low in the vicinity of the Pier 96 area, and bicyclists are generally able to travel along streets with ease.

Table 5-17.3. Bicycle Counts for Street Segments near the Pier 96 MHF

Street Segment	Morning	Afternoon
Third Street and Evans Avenue	66	56

Source: SFCTA (2017)

Emergency Access Conditions

The closest fire station to the Pier 96 MHF is San Francisco Fire Department Station No. 49, located approximately 0.90 mile west at 1415 Evans Avenue. From this station, emergency vehicles have access to the MHF via Cargo Way.

Parking Conditions

There are no on-street commercial loading spaces and limited passenger loading/unloading zones adjacent to, or in the vicinity of the Project Area. Parking is available during day time hours at several private parking garages and parking lots near the Project Area, along The Embarcadero. Parking for workers is readily available at the MHF areas.

Regional Ferry Service Providers

WETA is a regional public transit agency providing a public water transportation system in the Bay Area. WETA provides ferry service under the San Francisco Bay Ferry brand. The service connects San Francisco with the East Bay and North Bay, and South San Francisco with the East Bay (Figure 5-17.1).

WETA operates from nine terminals, located in Alameda (Main Street and Harbor Bay), Oakland (Jack London Square), San Francisco (Ferry Building, Pier 41, and AT&T Park), South San Francisco (Oyster Point), and Vallejo (Georgia Street and Mare Island). Through a contract with WETA, the Blue & Gold Fleet provides ferry service from Pier 41½ to Vallejo/Mare Island, Alameda, and Oakland. There have been up to 34 departures per day total.

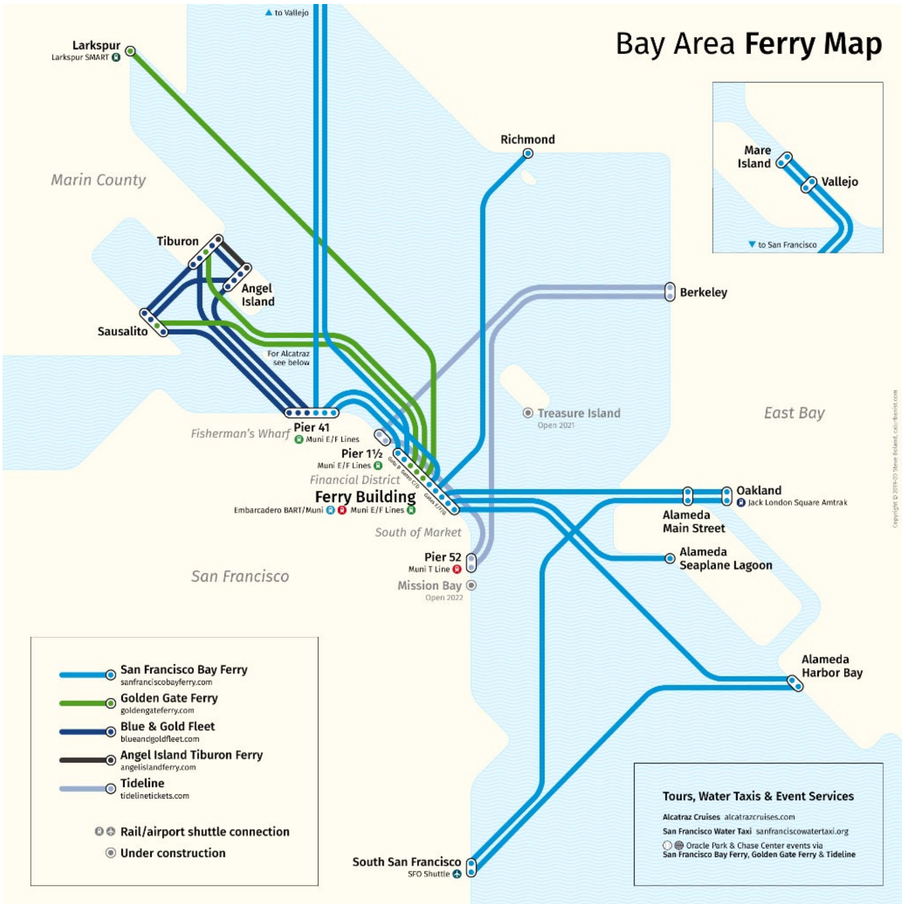

Figure 5-17.1. San Francisco Bay Ferry Terminals and Routes

Regulatory Framework:

Federal Regulations

There are no federal regulations relevant to transportation impacts associated with the Project.

State and Local Regulations

Transportation analysis in California is guided by policies and standards set at the state level by the California Department of Transportation (Caltrans) as well as by local jurisdictions. Both Caltrans and local jurisdictions generally assess the impact of traffic conditions. Plans and policies related to transportation and circulation are generally designed to foster appropriate planning and accommodate future growth and the vehicular, transit, pedestrian, and bicycle demand associated with that growth.

For the freeways and Congestion Management Plan roadways (i.e., US 101 and Evans Avenue in the vicinity of Project Area), the threshold for congestion impacts due to transportation is determined by SFCTA. According to the SFCTA's 2015 San Francisco Congestion Monitoring Program, all Congestion Management Plan route segments within the City and County of San Francisco are required to operate at LOS D or better.

This transportation analysis applies CEQA Section 21099 (Modernization of Transportation Analysis for Transit-Oriented Infill Projects) and San Francisco Planning Commission Resolution 19579 adopted on March 3, 2016. The Planning Commission resolution carries out CEQA Section 21099 by replacing automobile delay with vehicle miles traveled (VMT) as the metric for assessing transportation impacts and establishing CEQA thresholds related to VMT and traffic hazards to determine if a project would result in significant VMT and traffic hazard impacts.

San Francisco General Plan Transportation Element

The following San Francisco General Plan Transportation Element policies are applicable to transportation conditions that could be affected by the Project:

- Policy 18.6: Use the Street Hierarchy System of the Transportation Element as the foundation for any national, state, regional and local network of streets and highways in San Francisco.
- Policy 38.1: Improve the existing regional network of truck routes by making designated routes in San Francisco convenient for non-local freight trips with the aim of making the routes direct and connected to other routes.
- Policy 27.1: Expand and improve access for bicycles on city streets and develop a well-marked, comprehensive system of bike routes in San Francisco.
- Policy 25.1: Create a citywide pedestrian street classification system.

WETA's Emergency Water Transportation System Management Plan

WETA was established by Senate Bill 976 in 2007 to replace the San Francisco Bay Water Transit Authority, which was created in 1999. WETA has been authorized by the State of California to oversee and operate a public water transit system within the Bay Area. WETA created and adopted an Emergency Water Transportation System Management Plan for the Bay Area in 2009. This plan integrates and complements the emergency plans of other agencies, to ensure mobility within the Bay Area following a major disaster. WETA produced a draft of a Short Range Transit Plan (WETA, no date); this plan has yet to be completed.

San Francisco Better Streets Plan

The Better Streets Plan, adopted in 2010, presents a unified set of standards, guidelines, and implementation strategies to govern how the City and County of San Francisco designs, builds, and maintains its pedestrian and streetscape facilities (San Francisco Planning Department 2010). The Better Streets Plan contains goals, policies, and design guidelines to improve pedestrian safety and accessibility, create a unified streetscape design, integrate pedestrians with transit, and improve street ecology and greening.

San Francisco Municipal Transportation Agency Bicycle Strategy

In August 2009, the Board of Supervisors approved the San Francisco Bicycle Plan, which includes a citywide bicycle transportation plan (comprising a Policy Framework and a Network Improvement document). The Bicycle Plan is now known as the San Francisco Municipal Transportation Agency Bicycle Strategy. The strategy contains objectives and identifies policy changes to enhance bicycle access and safety with respect to San Francisco's "bike-ability." It also describes the existing bicycle route network (a series of interconnected streets in which bicycling is encouraged) and identifies gaps within the citywide bicycle route network that require improvement (SFMTA 2013).

Northeastern Waterfront Area Plan

The Northeastern Waterfront Area Plan recommends objectives and policies designed to contribute to the waterfront's environmental quality, enhance the economic vitality of the Port and the City and County of San Francisco, preserve the unique maritime character, and provide for the maximum feasible visual and physical access to and along the Bay (San Francisco Planning 2003). The following policies are applicable to transportation conditions that could be affected by the Project:

- Policy 7.10: Continue operation of the small boat marinas at Pier 39 and at South Beach Harbor, and encourage additional locations for transient mooring to expand waterside access to the Northeastern Waterfront.
- Policy 9.4: To the extent feasible, facilitate and expand the operation of passenger ferry systems to minimize traffic impacts.

Evaluation of Environmental Effects:

a. Conflict with program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities? **(*Less Than Significant with Mitigation Incorporated*)**

Project Travel Demand (Roadways)

To evaluate potential impacts of the Project on the area transportation system, Project travel demand was calculated based on the number of estimated construction-related vehicle trips. These trips include those made by construction workers traveling to and from the MHF and staging areas, material and equipment deliveries, and hauling truck trips associated with disposal of sediment and debris. The number of Project trips would vary on a daily basis, depending on the construction phase, planned activity, and material delivery needs.

Construction would potentially occur over a 5- to 10-year period in which each remedial response area would be constructed in phases. Each remedial response area would generally be constructed in 1 year, except for Area E, which could take up to 2 years. Remedial work could be expedited in other ways, with some remedial response areas combined within a single construction season or year; others could take more than 1 year to complete. In addition, because the MHF would be constructed in the first year, additional trips would be necessary for construction of the facility itself, assumed to be during the year that Area A is completed.

To evaluate transportation impacts, a scenario considering the maximum activities that could be done in a single year, represented by combining Areas B and C into a single year/construction season, was considered. This "maximum" scenario would represent the maximum intensity of work, trucking and hauling trips, equipment usage, and work days. Area E was also evaluated to represent a scenario with maximum offsite transport of sediment. These two scenarios vary in periods of intensity, with more complex in-water work at Areas B and C but less overall volume of removal and capping compared to Area E. By evaluating both scenarios, "upper bound" transportation impacts are assessed.

Project trips for construction workers, material and equipment delivery, and hauling truck trips were estimated for each scenario based on information obtained from the design engineers (Haley & Aldrich) as outlined below. The assumptions used in this analysis are based on planning-level information; duration of work phases, numbers of workers, worker trips, hauling schedules and trips, and other aspects of construction would be determined by the contractor. The assumptions and resulting worker and truck trips provided herein are likely conservative (i.e., overestimates). Also, the estimated truck trips provided in Table 5.17.4 and discussed in Section 4.7.4 are average values. The analysis in this section considers time periods when activities can be more and less intensive.

Construction Worker Trips

The number of construction workers would vary substantially by remedial response area and across various work phases. On average, approximately 35 workers could be working in Areas B and C and 15 in Area E, spread out over several tasks depending on the phase of remediation. Remedial activities involving the maximum number of workers would occur in Areas B and C for approximately

33 days over the course of the assumed 203-day-long construction period (about 10 months assuming work occurs 6 days a week). In Area E, the maximum number of workers would occur for approximately 190 days over the course of the assumed 252-day-long construction period, for each year of work.

For simplicity, the average number of workers was assumed to be present for the duration of the Project in Areas B and C and Area E. Remediation activities would generally occur from Monday through Saturday, 10 hours a day, but for some phases (e.g., dredging), the work could occur for 24 hours a day (depending on tides), with occasional construction activities occurring on Sundays as needed. Assuming each worker would generate two daily trips (one inbound trip and one outbound trip), the Project is expected to generate up to 70 average daily trips for work done in Areas B and C and 30 average daily trips in Area E. While these construction workers would likely be spread over three 8-hour shifts over the 24-hour days, the number of 24-hour days would likely be limited. To be conservative, about half of total daily workers (approximately 35 construction workers in Areas B and C and 15 in Area E) are assumed to depart and the other half are assumed to arrive at the site during the weekday afternoon peak (5:00 p.m. to 7:00 p.m.) period. Because the MHF/staging area is far from transit or bicycle facilities, and pedestrian access is intermittent, all workers are conservatively assumed to drive alone to the MHF/staging area. In addition, some workers may arrive by water from the contractor’s yard, but this was not factored into the analysis.

Construction worker parking would be contained within the upland areas, located at the Pier 96 MHF/staging area. Access to parking for construction workers would be via Cargo Way and Jennings Street. In addition, a very limited number of workers may park near the Project Area on a limited number of days to establish access and stage construction equipment and material for in-water work. These workers would use existing lots near Pier 39. Limited numbers of workers would use The Embarcadero roadway for access to these parking lots.

Equipment and Material Truck Trips

Equipment and material delivery (and pickup) truck trips would be associated with the mobilization and demobilization of construction equipment and transport of materials and supplies used for the Project. These trips would include, but not be limited to, deliveries of materials needed for mobilization and MHF/staging, backfilling materials, cap/armoring materials, and stabilization materials.

In Areas B and C, deliveries would require approximately 937 truckloads (a total of 1,852 truck trips assuming one inbound trip and one outbound trip for each truckload). The delivery of initial construction materials would span approximately 4.5 weeks, resulting in 16 daily truck trips. The delivery of all other materials is expected to occur throughout the duration of the remediation activities for Areas B and C, or approximately 167 days, resulting in an average of 11 daily truck trips.

In Area E, deliveries would require approximately 485 truckloads (a total of 969 truck trips). The delivery of initial construction materials would span approximately 4.5 weeks, resulting in five daily truck trips. The delivery of all other materials is expected to occur throughout the duration of the remediation activities for Area E, or approximately 214 days, resulting in an average of five daily truck trips.

Based on the information above, for the purpose of estimating equipment and material delivery truck trips, a maximum of 27 average daily truck trips was assumed for Areas B and C, and a maximum of 10 average daily truck trips was assumed for Area E.

In general and to the extent practicable, delivery truck traffic would be from 9:00 a.m. to 3:00 p.m. (6 hours per workday), to avoid peak periods (7:00 a.m. to 9:00 a.m. and 5:00 p.m. to 7:00 p.m.). Thus, the Project would generate approximately four equipment and material delivery truck trips per hour for Areas B and C. In Area E, the Project would generate approximately two equipment and material delivery truck trips per hour. There would generally be no truck trips occurring during the afternoon peak (5:00 p.m. to 7:00 p.m.) period. Equipment and material delivery trips are summarized in Table 5-17.4.

Table 5-17.4. Number of Truck Trips for Each Phase of Work

Remedial Response Area	Phase	Typical Truckloads	Average Number of Truck Round Trips	Typical Days of Transportation[a]	Average Trips per Day
Material and Equipment Imports					
B and C[b]	Mobilization/Site Preparation	220	440	28	15.7
	Slope Stabilization[c]	22	44	22	NA
	Backfilling/Capping/Armoring	665	1,330	167	8.0
	Sediment Dewatering/Conditioning	30	60	167	0.4
	Total	**937**	**1,874**	**--**	**25.0**
Area E[d]	Mobilization/Site Preparation	67	133	28	4.8
	Slope Stabilization[c]	23	46	23	NA
	Backfilling/Capping/Armoring	365	730	214	3.4
	Sediment Dewatering/Conditioning	30	60	214	0.3
	Total	**485**	**969**	**--**	**8.43**

Notes:

Quantities and duration provided by Haley & Aldrich, June 2020.

[a]Days of transportation are equivalent to the work phase days. Assumes that transportation of material imports would occur throughout the duration of the Project phase.
[b]The maximum number of hours or days was used between Areas B and C.
[c]Up to 25 piles per truck trip can be delivered at one time. At most, there would only be one truck per week delivering materials for slope stabilization.

[c]Because Area E could take up to 2 years, the table shows number of truck trips and quantities for each year of work.

Delivery trucks traveling to and from the Pier 96 MHF/staging area would use Cargo Way to Third Street and Cesar Chavez Street to and from Interstate 280, or Jennings Street to Evans Avenue and Cesar Chavez Street to and from US 101, as shown in Figure 4-7. Due to weight restrictions, delivery trucks may not be able to use an 8.7-mile segment of Interstate 580 from Foothill Boulevard in San Leandro to Grand Avenue in Oakland (post-mile marker 34.89 to 43.76 in Alameda County) (Caltrans 2020).

If the alternative option for sediment management at the Port of Oakland's Berth 10 were implemented, only equipment related to sediment management would be used at Berth 10. There would be no material truck trips to Berth 10. The majority of workers and equipment and material delivery would be from the staging area in San Francisco (Pier 96 or an alternate location), and hauling trucks would use Maritime Street in Oakland for access to Interstate 880, as shown in Figure 4-8.

Landfill Truck Trips

Trucks would haul processed sediments, piles, and debris from the MHF to a disposal facility.

Throughout the duration of the Project, approximately 143 to 561 truckloads would be hauled from the MHF to a disposal facility, depending on the remedial response area. Table 5-17.5 summarizes the average truckloads, round trips, and days of transportation that are expected for each remedial response area.

Table 5-17.5. Number of Truck Trips for Landfill Disposal

Remedial Response Area	Estimated Truckloads	Estimated Number of Landfill Round Trips	Estimated Duration of Offsite Transportation (Days)
A	265	545	76
B	143	300	46
C	353	710	108
D	220	436	75
E	561	1,222	190

Notes:
It is assumed that 20 percent of Area E removal volumes may be apportioned for beneficial reuse. These sediments may be transported by barge to SF-DODS, or hauled to the Montezuma Wetlands Restoration Project or the Cullinan Ranch Restoration Project.

Processed sediments and other wastes would be hauled from the MHF to a permitted disposal facility after sediments have been treated and dewatered (according to the Sediment Processing and Construction Water Management Plan) and waste characterization sampling is complete. Materials would be considered ready to be loaded and hauled at the completion of these steps. On any given day throughout the duration of the transportation phase of the Project, approximately 6 to 21 trucks could enter and leave the MHF, with the number ultimately determined by the availability of trucks, constraints at the site and landfills, and amount of materials ready to be hauled; on some days, no materials would be hauled away from the MHF.

Hauling truck traffic would generally be from 9:00 a.m. to 3:00 p.m. (6 hours per work day). For the purpose of conservative analysis, the maximum of 21 trucks entering and leaving the MHF during work in any remedial response area was evaluated. There would be a maximum of approximately four hauling trips per hour, consisting of two inbound and two outbound trips. It is unlikely that truck trips would be occurring during the afternoon peak (5:00 to 7:00 p.m.) period because the trucks would need to leave the MHF early enough to arrive at the landfills before closing time.

Similar to equipment and material delivery trucks, hauling trucks traveling to and from the Pier 96 MHF would use Cargo Way to Third Street and Cesar Chavez Street to and from Interstate 280 or Jennings Street to Evans Avenue and Cesar Chavez Street to and from US 101, as shown in Figure 4-7. Because of special weight restrictions, [8] hauling trucks generally cannot use an 8.7-mile segment of Interstate 580 from Foothill Boulevard in San Leandro to Grand Avenue in Oakland (post-mile marker 34.89 to 43.76 in Alameda County) (Caltrans 2020) to access the Port of Oakland's Berth 10. If the alternative option for managing sediments at Port of Oakland's Berth 10 were implemented, hauling trucks would use Maritime Street for access to Interstate 880, as shown in Figure 4-8.

Based on the assumptions for construction worker trips, equipment and material delivery trips, and hauling truck trips described above, the Project is expected to generate a maximum of approximately 138 trips on a daily basis during peak construction in Areas B and C and 82 trips on a daily basis during peak construction in Area E. During the afternoon peak hour, the Project would generate a maximum of 35 trips in Area B and C and 21 trips in Area E. Table 5-17.6 shows the breakdown of these trips.

[8] No trucks over 4.5 tons, except passenger buses and paratransit vehicles (Caltrans 2020).

Summary of Worker and Truck Trips

Table 5-17.6. Estimated Average Daily and Peak Hour Project Vehicle Trip Generation

Trip Type	Daily		Afternoon Peak	
	IB	OB	IB	OB
From MHF				
Areas B and C				
Construction Worker Trip	35	35	18	17
Equipment and Material Delivery Truck Trip	13	13	0	0
Hauling Truck Trip[a]	21	21	0	0
Total	69	69	18	17
Area E				
Construction Worker Trip	15	15	8	7
Equipment and Material Delivery Truck Trip	5	5	0	0
Hauling Truck Trip[a]	21	21	0	0
Total	41	41	8	7

Notes

IB = inbound

OB = outbound

Area E will occur over a 2-year period. Table shows vehicle generation needed for each year of work

[a]The maximum number of hauling trips—21 truck trips per day—was used for each remedial response area. However, on any given day throughout the duration of the Project, approximately 6 to 21 trucks could enter or leave the MHF/staging area during any work phase, with the number determined by the availability of trucks, constraints at the site and landfills, and amount of materials ready to be hauled, and on some days no materials would be hauled

If the alternative option for sediment management at the Port of Oakland's Berth 10 were implemented, the same number of daily trips would occur. However, worker trips and equipment and material delivery trips would be from the staging area in San Francisco (Pier 96 or an alternate location) and hauling trucks would use Maritime Street in Oakland for access to Interstate 880, as shown in Figure 4-8.

For the duration of the Project, the impacts on the area transportation system would mainly relate to increased vehicle traffic on the roadways. The following plans, controls, and AMMs (described in Attachment A) would be implemented to minimize impacts on roadways and the transportation system:

- Waste Management and Transportation Plan (e.g., truck export and import tracking procedures, transportation routes, onsite signage requirements, estimated daily quantity and schedule for trucks, emergency procedures related to transportation)
- Transportation Control Measures (e.g., haulers will follow all applicable requirements, waste will be transported using USDOT-approved trucks, transportation contractor will be registered).

Specifically, the plans, controls, and AMMs would describe how the Project would manage materials in a way that reduces impacts on human health and the environment and minimizes impacts on local traffic, business, and residents near the Project Area and along designated haul routes. With implementation of these plans, controls, and AMMs and given the estimated volumes of worker and truck trips, the potential Project-related impacts on the transportation system would be less than significant and would not conflict with any programs, plans, ordinances or policies related to roadways.

Parking

All construction equipment, trailers, and worker parking would be contained within the Pier 96 MHF or other staging area(s). A very limited number of workers may park near the Project Area to establish access and stage construction equipment and materials for in-water work. These workers would use existing lots near the Project Area. As a result, no spillover parking would occur on public roadways. Therefore, the Project's impact on parking conditions would be less than significant, and the Project would not conflict with any programs, plans, ordinances, or policies related to parking.

Bicycle and Pedestrian Facilities

The Project would not alter existing or planned future pedestrian facilities (e.g., sidewalks, crosswalks, or pedestrian paths) or bicycle lanes. However, as discussed in the FS/RAP (Haley & Aldrich 2021), security fencing may be constructed as needed around docks and piers adjacent to active work areas each season to maintain separation between the public and the work area. Fencing would demarcate the landside perimeter of the in-water work areas and provide additional safety to personnel who may be working over the water surface below. Security fencing will only impede pedestrian access to the majority of the walkways or piers, except for when work is occurring in portions of Areas C and D, where the Pier 41 wooden viewing pier could be closed for safety reasons for a short period. Work near Pier 41 may result in intermittent closures based on public safety due to dredging activities in close proximity to the Pier, but no long term closures are anticipated. The Pier would not be closed on days that there are no dredging activities occurring. Therefore, the Project would not conflict with any programs, plans, ordinances, or policies related to bicycle lanes or pedestrian paths.

Transit: Regional Ferry Service

The Blue & Gold Fleet/WETA operates San Francisco Bay Ferry's at Pier 41½. During remediation activities in Area C, ferry service will either be temporarily relocated or continue on a modified schedule, or a combination of both. Ferry service would be affected for approximately 140 days (5 months) for the completion of in-water work activities.

As shown in Figure 5-17.1, the Blue & Gold Fleet provides commuter ferry service to and from Pier 41½ to Vallejo/Mare Island, Alameda, and Oakland. There are normally up to 34 departures per day total. Ferry service departs from Pier 41½ and stops at the San Francisco Ferry Building before continuing service to the route destination for most routes. However, the Vallejo/Mare Island route normally uses only Pier 41½. One option would be for ferry service to be temporarily relocated to use only the San Francisco Ferry Building dock when in-water remediation activities in Area C are progressing.

There are three berths and two docks at Pier 41½. As an alternative approach (or in addition), the Project sponsor/applicant (PG&E) and co-applicant (Port) could work in conjunction with the remediation contractor to coordinate remediation activities (e.g., timing and sequencing) and berthing locations with the Blue & Gold Fleet/WETA to minimize impacts on ferry service. This coordination could be addressed as part of the Dredging and Capping Operations Plan.

In the short term, Project-related activities could affect ferry service from Pier 41½, which would conflict with the Northeastern Waterfront Area Plan. The following mitigation measure would be implemented to reduce Project-related impacts on ferry (transit) service at Pier 41½ to less than significant.

Mitigation Measure TRANS-1

The Project sponsor/applicant (PG&E) and co-applicant (Port of San Francisco) shall coordinate with all relevant stakeholders (e.g., Blue & Gold Fleet and WETA) to develop a plan to address transportation-related impacts on commuter ferry service as a result of construction activities. The plan shall address how stakeholders and contractors will coordinate and phase construction activities and/or find alternative options (e.g., temporary relocation of ferry services, alternate berthing locations) to minimize impacts on commuter ferry service. In addition, the Project sponsor/applicant and co-applicant shall work with stakeholders to facilitate notifications and communications to the public (e.g., online updates) of any ferry service schedule and berthing location changes well in advance of such changes.

b. Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)? **(*Less Than Significant Impact*)**

In accordance with CEQA Guidelines Section 15064-3 generally, VMT is the most appropriate measure of transportation impacts. However, because the Project will not result in permanent improvements that generate additional drivers or is not a transportation project, VMT can be evaluated qualitatively.

For the purposes of this section, "vehicle miles traveled" refers to the amount and distance of automobile travel attributable to a project. Project-related vehicle trips include construction workers traveling to and from the Pier 96 MHF/staging area, equipment and material deliveries, and haul truck trips associated with disposal of excavated sediments. Adding construction vehicle traffic to existing roadway volumes without increasing the capacity of the roadways could potentially result in short-term increases in congestion and vehicle delay. As discussed above, the Project would generate a maximum of approximately 136 trips on a daily basis during peak construction in Areas B and C and 80 trips on a daily basis during peak construction in Area E. During the afternoon peak hour, the Project would generate a maximum of 35 trips in Areas B and C and 15 trips in Area E. These trips would occur along Cargo Way to Third Street and Cesar Chavez Street to and from Interstate 280 or Jennings Street to Evans Avenue and Cesar Chavez Street to and from US 101. Traffic impacts in the Project Area itself (Piers 39 to 43½) are expected to be minimal.

With regard to VMT, the additional construction traffic generated by the Project implementation would represent a temporary increase in local traffic levels, which would not constitute a substantial increase in VMT on the regional level due to the temporary and limited duration. If the alternative option for managing sediments at the Port of Oakland's Berth 10 were implemented, there would be less distance traveled from Berth 10 to any of the landfills chosen for the disposal of materials. Therefore, the increase in VMT on the regional level under this alternative option would be marginally lower than under the Pier 96 option due to VMT savings from reduced vehicle trips between Oakland and the landfill (Table 11 of the FS/RAP, Haley & Aldrich 2021). Similar to the analysis for Pier 96, the net increase in VMT on the regional level under the Berth 10 option would be temporary and of limited duration. Neither option would close or alter public roadways; thus, existing traffic patterns would not be affected. Moreover, in both the City and County of San Francisco and the City of Oakland, construction-related impacts are generally not considered significant due to their temporary and limited duration. Thus, the Project's VMT impacts would be less than significant, and the Project would not conflict with any plans, ordinances, or policies related to VMT.

In the City and County of San Francisco, a project's operational impact on intersections is no longer considered a significant impact, and therefore intersection operating conditions were assessed qualitatively for informational purposes only. As presented in Table 5-17.1, all street segments currently operate at acceptable service levels (LOS D or better) during the weekday afternoon peak hour under existing conditions. The worst LOS occurs on Evans Avenue (southbound), which operates at LOS D. The limited number of Project trips (up to 35 and 15 vehicle trips during the afternoon peak hour in Areas B and C and Area E, respectively) that would be added to these Street segments is not expected to cause their LOS to degrade substantially The contractor would prepare and implement a Waste Management and Transportation Plan and implement Transportation Control Measures (outlined in Attachment A) to reduce impacts on VMT. With the implementation of the plans, controls, and AMMs listed in section (a) above and given the estimated volumes of worker and truck trips, the Project impacts related to VMT would be less than significant.

c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? **(*Less Than Significant Impact*)**

The Project would not include any geometric design features like sharp curves or dangerous intersections. Nor would the project require incompatible uses of roadways by off-road vehicles. Construction vehicles could increase traffic safety hazards on public roadways due to potential conflicts between construction vehicles (with slower speeds and wider turning radii than autos) and vehicles, bicyclists, or pedestrians using the roadways. The use of Cargo Way to Third Street and Cesar Chavez Street to and from Interstate 280 or Jennings Street to Evans Avenue and Cesar Chavez Street to and from US 101 could potentially temporarily and intermittently reduce the capacity of the roadways due to slower movements and larger turning radii of construction trucks. It is anticipated that the Project would generate no more than 36 trips in Areas B and C and 15 trips in Area E trips during the peak hour, which would typically occur during the afternoon period between 9:00 a.m. and 3:00 p.m. The contractor would prepare and implement a Waste Management and Transportation Plan (outlined in Attachment A) to reduce any hazards due to a geometric design feature. With the implementation of this type this plan and given the estimated volumes of worker and truck trips, the Project's impact on traffic hazards would be less than significant.

d. Result in inadequate emergency access? **(*Less Than Significant Impact*)**

For in-water work conducted in the Project Area, the contractor would prepare and implement a Dredging and Capping Operations Plan (outlined in Attachment A) to demarcate and regulate access to work areas to protect public safety, including providing aids to navigation. The aids to navigation would require U.S. Coast Guard approval prior to Project implementation. The district commander would confirm the minimum marking requirements and issue and maintain a local notice to mariners for the duration of the in-water work. Therefore, the Project would not adversely affect emergency access to the Project Area or surrounding area.

The fire station nearest to the Pier 96 MHF area is Fire Station No. 25 located at 1415 Evans Avenue about 0.9 mile west. The street network serving the MHF area currently accommodates the movements of emergency vehicles that travel to the MHF. In the event of an emergency, vehicle access to the MHF during Project implementation would not be substantially different from existing conditions. Emergency vehicles would continue to use Evans Avenue, Cargo Way, and Jennings Street. Furthermore, although the Project would generate additional traffic in the area, this increase would not hinder the movement of emergency vehicles in the vicinity of the MHF. Project impacts related to emergency access near the Project Area and MHF would therefore be less than significant.

References:

1. Caltrans. 2020. Special Route Restriction. Available at: https://dot.ca.gov/programs/traffic-operations/legal-truck-access/restrict-list.
2. Haley & Aldrich. 2021. Feasibility Study/Remedial Action Plan, Piers 39 to 45 Sediment Investigation Area, San Francisco, California. File No. 128154-016. September 2021. Prepared for Pacific Gas and Electric Company, San Ramon, CA. Haley & Aldrich, Inc., Oakland, CA.
3. San Francisco Planning. 2003. General Plan - NorthEastern Waterfront Area Plan. Available at: https://generalplan.sfplanning.org/NE_Waterfront.htm.
4. San Francisco Planning. 2010. Guide to the San Francisco Better Streets Plan. Available at: https://sfplanning.org/sites/default/files/archives/BetterStreets/docs/Guide_to_BSP.pdf.

5. San Francisco Planning. 2018. General Plan – Transportation Element. Available at: https://generalplan.sfplanning.org/I4_Transportation.htm.

6. SFCTA. 2017. Congestion Management Program. San Francisco County Transportation Authority, Congestion Management Agency. Available at: https://www.sfcta.org/sites/default/files/2019-12/CMP_2017_12-05-17.pdf.

7. SFMTA. 2013. SFMTA Bicycle Strategy. Available at: https://www.sfmta.com/sites/default/files/BicycleStrategyFinal_0.pdf.

8. WETA. No date. 2020 Short Range Transit Plan—FY2019-20 to FY2028-29. Draft. San Francisco Bay Area Water Emergency Transportation Authority.

5.18 Utilities and Service Systems

Would the project:

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

Project Activities Likely to Create an Effect:

- Sediment dewatering and disposal of treated water
- Disposal of contaminated sediment and debris

Existing Environmental Conditions:

SFPUC provides retail drinking water and wastewater services to the City and County of San Francisco, and power to the residents and businesses of San Francisco through the CleanPowerSF program. The SFPUC operates a Recycled Water Truck Fill Station at the Southeast Water Pollution Control Plant that provides recycled water for construction activities at no charge. At Berth 10 in Oakland, potable water is supplied by the East Bay Municipal Utility District.

The uplands adjacent to the Project Area between Piers 39 and 41 in San Francisco are serviced by combined sewers receiving stormwater runoff and sanitary flows. The combined sewer system conveys stormwater runoff and sanitary flows to the SFPUC's Southeast Water Pollution Control Plant for treatment before the flows are discharged to the Bay. If the capacity of the City's wastewater storage and treatment systems is exceeded during major storm events, the combined wastewater receives the equivalent of primary treatment in storage/transport structures and is discharged to the Bay through combined sewer overflow discharge structures. A combined sewer overflow discharge structure (discharge point 13/Beach Street Outfall) located adjacent to A Dock at Pier 39 East Basin discharges toward Area E (SFPUC 2010).

The uplands adjoining Piers 41 to 43½ and the Pier 96 area are located in the SFPUC's municipal Separate Storm Sewer System area (SFPUC 2020). There are four stormwater outfalls in the uplands adjoining Piers 39 to 43½ that are owned and operated by the Port and discharge into the Project Area (Figure 3-1).

Stormwater at the Pier 96 terminal is managed by the Port's stormwater infrastructure comprised of stormwater collection inlets/manholes and storm gravity pipes that flow into one of the four outfalls located within Pier 96. Each outfall discharges directly to the Bay. The MHF area includes collection inlets/manholes and a storm gravity pipe which flows to outfall C at Pier 96's North Berth area.

Local solid waste disposal is provided by Recology. Recyclables are sorted at the Pier 96 Recycle Central. All other solid waste is taken to the San Francisco Transfer Station located on Tunnel Avenue for sorting, and then disposed of at the Hay Road landfill in Vacaville (Recology 2021).

As discussed in Section 5.6, SFPUC provides electricity to San Francisco. PG&E is the main supplier of natural gas to San Francisco.

Regulatory Framework:

Federal Regulations

Resource Conservation and Recovery Act

The EPA regulates solid waste under RCRA. Title 40 of the Code of Federal Regulations (CFR) Parts 239 through 259 contain the regulations for solid waste**.**

Clean Water Act

The CWA requires the State of California to adopt and enforce water quality standards to protect the Bay. As established through the Porter-Cologne Act, the State Water Resources Control Board shares responsibility with the Regional Water Board for implementation of the CWA's provisions as they relate to water quality in the Bay. CWA Section 401 water quality certifications are issued to applicants for a federal license or permit for activities that may result in a discharge into waters of the

U.S., including but not limited to the discharge of dredged or fill material. Section 401 requires certification from the State Water Resources Control Board verifying that the dredge or fill project is in compliance with all state water quality standards.

State Regulations and Agencies

Porter-Cologne Water Quality Control Act

Under the Porter-Cologne Water Quality Control Act (California Water Code, Division 7), the State Water Resources Control Board has authority over waters of the state and water quality. “Waters of the state” are defined as “any surface water or groundwater, including saline waters, within the boundaries of the state” (California Water Code Section 13050[e]). The Regional Water Quality Control Boards have local and regional authority. The Regional Water Board has authority in the Bay region, including the Project Area. The Regional Water Boards prepare and periodically update Basin Plans, which establish:

- Beneficial uses of water designated for each protected water body
- Water quality standards for both surface water and groundwater
- Actions necessary to maintain these water quality standards.

Projects that will discharge waste to waters of the state must file a report of waste discharge with the appropriate Regional Water Quality Control Board, if the discharge could affect the quality of waters of the state (California Water Code Article 4, Section 13260). The appropriate Regional Water Quality Control Board will issue WDRs or a waiver of the WDRs for the project. The requirements will implement any relevant Water Quality Control Plans that have been adopted, and must take into consideration the beneficial uses to be protected and the water quality objectives reasonably required for that purpose (California Water Code Article 4, Section 13263).

California Department of Resources Recycling and Recovery

CalRecycle is a department within the California Environmental Protection Agency. CalRecycle administers and provides oversight for all of California’s state-managed non-hazardous waste handling and recycling programs. CCR Title 14 includes regulations related to non-hazardous waste management in California, and Title 27 includes regulations for waste disposal on land.

California Integrated Waste Management Act and Related Laws

The California Integrated Waste Management Act (AB 939) requires the implementation of waste management plans and mandates that local jurisdictions divert at least 50 percent of all solid waste, using 1990 as a baseline level.

The State Model Ordinance of the California Solid Waste Reuse and Recycling Access Act of 1991 and AB 341 both created requirements for businesses to have sufficient recycling programs.

Regional and Local Regulations, Plans, and Agencies

San Francisco Bay Basin (Region 2) Water Quality Control Plan

The Basin Plan is the master policy document pertaining to the legal, technical, and programmatic structure for regulating water quality in the Bay. The Basin Plan offers guidelines for the protection of surface waters (i.e., freshwater lakes, rivers, and streams), estuaries, enclosed bays, and ocean waters, and describes the water quality control measures that are necessary to protect the beneficial uses of the Bay. The Basin Plan identifies the beneficial uses for each segment of the Bay and its tributaries, water quality objectives for the reasonable protection of the applicable uses, and an implementation plan for achieving the water quality objectives (Regional Water Board 2019).

San Francisco Bay Conservation and Development Commission

The BCDC is the agency responsible for implementing the McAteer-Petris Act. The act empowers BCDC to issue permits for all filling and dredging in the Bay (as well as 100 feet inland from the high tide line). BCDC also administers the federal CZMA within the Bay segment of the California coastal zone. A BCDC permit would be required for any fill in the Bay and development within the 100-foot shoreline band.

San Francisco Public Utilities Commission

Discharges from the SFPUC's combined sewer storage and treatment systems are regulated under Regional Water Board Order No. R2-2013-0029, NPDES Permit No. CA0037664. This permit defines WDRs including discharge prohibitions, effluent limitations, receiving water limitations, and provisions including monitoring and reporting requirements and pre-treatment programs.

As part of its pre-treatment program, the SFPUC manages the Construction Site Runoff Control Program to ensure that all construction sites implement BMPs to control construction site runoff in accordance with the City and County of San Francisco's Construction Site Runoff Control Ordinance. All construction sites must implement BMPs, and if a construction activity within the city disturbs 5,000 square feet or more of ground surface, applicants must also submit an Erosion and Sediment Control Plan and a Project Application before starting construction-related activities. Projects requiring a Stormwater Pollution Prevention Plan/Water Pollution Control Plan under the Construction General Permit may submit the Stormwater Pollution Prevention Plan/Water Pollution Control Plan in lieu of an Erosion and Sediment Control Plan to comply with the Construction Site Runoff Control Program. A Stormwater Pollution Prevention Plan is required to comply with the State Water Resources Control Board's NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities only if the project will disturb more than 1 acre of land. A Water Pollution Control Plan should be developed for all construction sites regardless of size.

City and County of San Francisco

In San Francisco, solid waste is managed by the Department of the Environment and Recology. The San Francisco Construction and Demolition Debris Recovery Program (Ordinance Number 27-06) requires that 65 percent of mixed construction and demolition waste be diverted from landfills. More broadly, the San Francisco Board of Supervisors adopted the Zero Waste to Landfill Resolution (Resolution No. 002-03-COE), which set a goal for San Francisco to achieve zero waste by 2020.

San Francisco Public Works Code, Article 21, Restriction of Use of Potable Water for Soil Compaction and Dust Control Activities, indicates that "any person or entity that desires to use potable water for soil compaction or dust control activities to be undertaken in conjunction with a construction or demolition project occurring within the boundaries of the City and County of San Francisco shall apply to the General Manager of the Water Department for permission for such use of potable water." Furthermore, the code states that "reclaimed water, well water and groundwater shall be transported and used in accordance with State Health Department, State Water Resources Control Board, Regional Water Quality Control Board and City Departments of Health and Public Works orders, standards and regulations. Such transportation and use shall at all times be in compliance with all applicable labeling, warning and signage requirements."

Evaluation of Environmental Effects:

a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects? (***Less Than Significant Impact***)

The Project does not include the construction of new or expanded utility facilities. Temporary utility relocation is possible during construction activities if any utilities are located within remedial areas, but relocation would not cause significant environmental effects because utility relocation would be done in concert with dredging which is already temporarily disturbing the Project Area. Temporary power and decant water treatment facilities would be necessary for the MHF and sediment dewatering activities; this component is discussed in more detail in section (c) below.

PG&E procedures for utility clearance would be completed before ground disturbance. This work would include identifying any overhead or underground utilities at the Pier 39 and MHF areas. Prior to implementing the recommended remedial alternative, Underground Service Alert would be notified of the pending intrusive subsurface work. Underground Service Alert requires notification of a minimum of 2 full workdays prior to the start of excavation activities. A private utility locator would also be contracted to identify utilities and other subsurface anomalies prior to excavation activities (Haley & Aldrich 2021). In addition, Attachment A describes the control measures to be implemented during construction, including one that would protect existing utilities from damage by construction operations. This control measure states that any features of the Project Area that are damaged or temporarily relocated by the contractor during construction shall be repaired or restored by the contractor to a condition equal to or better than they were prior to such damage or temporary relocation.

Because the Project would not require new or expanded facilities, and the impact from potential temporary relocation of utilities would temporary and limited, impacts would be less than significant.

b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years? (***Less Than Significant Impact***)

The Project would include the use of a small amount of water for dust suppression activities, decontamination rinse water, and tire wash water, as necessary. The following plans (described in Attachment A) would be implemented to address water usage, including the use of non-potable water (e.g., recycled water) to the extent feasible to conserve potable water resources:

- Dust, Vapor, and Odor Control Plan
- Water Pollution Control Plan or Erosion and Sediment Control Plan.

The Sediment Processing and Construction Water Management Plan would describe specific approaches for processing sediment decant water and other construction water that may be generated while implementing the remedy and identify water supply sources and associated uses. Implementation of the plans would ensure that potable water resources are conserved; water supplies are expected to be sufficient for the Project.

c. Result in determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the projects projected demand in addition to the provider's existing commitments? (***Less Than Significant Impact***)

The Project would not substantially increase the amount or pollutant load of stormwater runoff or sanitary sewer flows, and therefore would not exceed wastewater treatment capacity or result in the need for new wastewater facilities. Remediation workers would have temporary portable toilets and hand washing stations, the waste from which would be hauled offsite; therefore, remediation workers would not contribute to sanitary flows.

During materials handling and management, stormwater runoff would be managed in accordance with the following plans, controls, and AMMs (described in Attachment A):

- Water Pollution Control Plan or Erosion and Sediment Control Plan (e.g. plan for monitoring runoff when water is used for dust control on stockpiles, specific practices that may be implemented to reduce the sediment load of stormwater runoff from the MHF)
- Surface Water Quality Monitoring (e.g. description of water quality monitoring during removal of contaminated sediments, descriptions of temporary enclosures)
- Sediment Processing and Construction Water Management Plan (e.g. sediment treatment and dewatering plan)
- Dust, Vapor, and Odor Control Plan (e.g., will include possible sources of water for dust suppression)
- Material Handling Facility Control Measures (e.g. if stockpiling materials is necessary, stockpiles will be stored within a bermed area on liner material, protected from stormwater run-on/runoff, and covered to prevent windblown dust).

Due to the implementation of the above-described plans, controls, and AMMs, and requirements imposed through the permitting process (e.g., NPDES, WDR permits), the Project would minimize and properly manage any potential sources of polluted runoff, and would ensure that stormwater runoff from the Project would not contribute significant levels of pollutants to the combined sewer system or the Bay that could otherwise contribute toward exceeding waste discharge limits.

A temporary wastewater treatment plant would be constructed at the MHF for treating decant water prior to discharging. This plant would be only for Project use and would be deconstructed and disposed of after Project completion. No relocation or construction of new wastewater facilities would be needed. As discussed above and in Section 5.10, permits would be required for discharge of decant water.

It is expected that approximately 9 million gallons of water would be processed and treated per year during construction including any precipitation at Pier 96. The normal capacity of the combined sewer system is 80 million gallons per day in dry weather (and 575 million gallons per day in wet weather) (SFPUC 2014), so if treated decant water were to be discharged to the city sewer, the impact would be minimal. Where discharge back to the Bay or to a sewer is not possible, treated water may be transported offsite for disposal. The implementation of the above-described plans, controls, and AMMs, and requirements imposed through the permitting process would ensure that the impact on wastewater treatment capacity would be less than significant.

d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? **(*Less Than Significant Impact*)**

Implementation of the Project is estimated to generate about 88,000 cy of sediment and debris. In accordance with the Project's Waste Management and Transportation Plan, these materials would be dewatered and tested at the MHF and then hauled offsite for disposal at landfills that are appropriately permitted to accept the waste and have available capacity. It is estimated that the materials to be hauled off would be classified as non-hazardous and be disposed of at a Class II permitted landfill with adequate capacity (e.g., Keller Canyon in Contra Costa County). If hazardous waste is encountered, it would be a very small volume and would be disposed of at a permitted hazardous waste landfill with adequate capacity (e.g., Kettleman Hills, Buttonwillow).

Potential recycling (e.g., scrap metal), regeneration (e.g., granular activated carbon), and reuse (e.g., decontaminated reusable materials and equipment) may be evaluated to reduce the quantity of waste to be landfilled and to meet reduced waste regulations described above. Recyclables, compost, and waste would be collected in bins within the Project Area. The recycling and reuse of debris would be addressed in a waste diversion plan). Various control measures and AMMs are also described in detail in Attachment A that would address waste minimization and proper management:

Implementation of the above-described plans, controls, and AMMs would ensure that the Project would not generate solid waste in excess of state or local standards, and impacts on solid waste facilities and solid waste reduction goals would be less than significant.

e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste? **(*Less Than Significant Impact*)**

The Project would be required to comply with federal, state, and local statutes and regulations related to solid waste. The Project's Waste Management and Transportation Plan would detail specific approaches for managing materials in a way that reduces impacts on human health and the environment and minimizes impacts on local traffic, business, and residents near the Project Area and along designated haul routes, as described in Attachment A. Additional control measures are described in Attachment A.

The Project would be subject to the San Francisco Construction and Demolition Debris Recovery Program (Ordinance Number 27-06) and the Zero Waste to Landfill Resolution (Resolution No. 002-03-COE). To meet these requirements, a licensed solid waste hauler would provide collection and hauling of construction and demolition waste in the Project Area. These provisions would apply to normal construction-related waste, and not sediment or debris removed from the in-water construction area. Waste would first be taken to a local transfer station where recyclable materials would be identified and recovered. Remaining waste that cannot be recycled or composted would then be transported to a licensed landfill with sufficient capacity. As such, the Project would comply with all relevant federal, state, and local requirements regarding solid waste. Therefore, the impact on compliance with federal, state, and local statutes and regulations related to solid waste would be less than significant.

References:

1. Haley & Aldrich. 2021. Feasibility Study/Remedial Action Plan, Piers 39 to 45 Sediment Investigation Area, San Francisco, California. File No. 128154-016. September 2021. Prepared for Pacific Gas and Electric Company, San Ramon, CA. Haley & Aldrich, Inc., Oakland, CA.

2. Recology. No date. Accessed on April 2021. Available at: https://www.recology.com/recology-san-francisco/sf-transfer-station/

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4. SFPUC. 2010. San Francisco Sewer System Master Plan. June 15, 2010 Available at: https://sfwater.org/index.aspx?page=313.

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6. SFPUC. 2020. San Francisco Municipal Separate Storm Sewer System (MS4) Area Map. Updated February 26, 2020. Accessed at: https://sfgov.maps.arcgis.com/home/webmap/viewer.html?useExisting=1&layers=791936420a50457fb6d470ca43116f7f.

5.19 Environmental Factors Potentially Affected

☐	Aesthetics	☐	Greenhouse Gas Emissions	☐	Public Services
☐	Agricultural and Forestry Resources	☐	Hazards and Hazardous Materials	☐	Recreation
☐	Air Quality	☐	Hydrology and Water Quality	☐	Transportation
☐	Biological Resources	☐	Land Use and Planning	☐	Utilities and Service Systems
☐	Cultural/Tribal Cultural Resources	☐	Mineral Resources	☐	Mandatory Findings of Significance
☐	Energy	☐	Noise	☒	None Identified
☐	Geology and Soils	☐	Population and Housing		

Based on the analysis contained in the IS, none of the resources in the summary checklist above would be significantly affected. Implementation of the mitigation measures summarized in Section 6 would ensure that potential impacts on the resources in the summary checklist would be less than significant.

5.20 Mandatory Findings of Significance

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☒	☐	☐
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

Based on the evidence provided in this IS, Integral makes the following findings:

a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory? (***Less Than Significant with Mitigation Incorporated***)

Based on the information presented within the Biological Resources section (Section 5.4), the Project would not substantially reduce the habitat of fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or reduce the number or restrict the range of an endangered, rare or threatened species l. Construction activities (e.g., dredging, cap and armor placement, and pile installation and removal) would likely cause temporary increases in in-water and underwater noise, airborne sound levels, and turbidity, and other water column impacts. These activities could affect special status fish, mammals and the habitat that intertidal and subtidal organisms use. Implementation of Mitigation Measures BIO-1A, BIO-1B, BIO-3 and BIO-4, adherence to AMMs, requirements of resource agency consultations and permits, and elements of the various plans and control measures (as discussed in Section 5.4 and Attachment A) would reduce potential impacts on special status species and their habitat to less than significant.

While impacts to state and federally listed birds are not expected to occur as a result of Project-related activities, impacts to nesting birds, protected pursuant to the MBTA and California Fish and Game Codes, could occur as a result of Project implementation. Mitigation Measure BIO-2 would ensure that the Project would include pre-construction nesting surveys and establish no work buffer zones around active nests in order to prevent impacts to nesting birds.

The Project would have an overall positive impact on the environment by reducing PAH contamination in site sediment, which could also reduce potential impacts to surface water and sediment quality. The short-term disturbance of the Project Area during the remediation activities would not permanently affect the concurrent or adjacent habitat.

Based on the information presented in the Cultural and Tribal Cultural Resources section (Section 5.5), the Project would be within an area that is heavily disturbed as a result of dredging for navigation and construction associated with industry, tourism, and transportation and would not cause a substantial adverse change in the significance of historical resources. One previously documented cultural resource, the Pier 43 Ferry Arch, was identified within the Project Area. The Pier 43 Ferry Arch is part of the built environment and above the high-water mark, and the Project would have no adverse impact on the resource (Alta Archaeological 2020). There is a low potential for intact historical or prehistorical resources to be discovered during remediation dredging activities because dredging would occur in recent sediments that have been previously disturbed. However, isolated historical artifacts associated with pier construction and/or local commerce may occur in the Project Area. Though unlikely, if such artifacts are discovered, the Project impact could be potentially significant. Implementation of mitigation measures CUL-1 and CUL-2 and control measures (awareness training) described in Attachment A would reduce potential Project-related impacts on historical resources to less than significant with mitigation incorporated.

b. Does the project have possible environmental 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 probable future projects)? (***Less than Significant with Mitigation Incorporated***)

Cumulative impacts occur when impacts from a project are combined with similar impacts from other past, present, and reasonably foreseeable projects in a similar geographic area. The San Francisco Planning Department provides information on planned projects on the SFEP's "Permits in My Neighborhood" on-line map. Projects from this map or projects listed on the Port website within 1 mile of the Project Area (Piers 39–43½) and 1 mile of Pier 96 (the preferred equipment staging area and MHF) were considered for their potential to result in cumulative impacts; the projects are listed in Table 5-20.1 and 5-20.2, respectively. The locations of these projects and the Project Area are shown in Figure 5-20.1. Berth 10 was not considered for this analysis because it is an existing facility with a permit for dredged material handling and therefore handling for the Project would have no cumulative impact with any other projects. Planned projects in the immediate vicinity of the Project Area include expansion of the Red and White Fleet ferry facilities, The Embarcadero Seawall repair program, and the BayEcotarium. Other projects within 1 mile of the Project Area are inland and would have very little overlap (other than similar proposed trucking routes) with Project construction activities. There is one project, a City and County of San Francisco Recreation and Park Department planned dredging project, that will likely use the Pier 96 MHF (or Berth 10), but the construction schedule for that project has been incorporated into the FS/RAP and Project schedule; there would be no overlap with Project activities. Other projects within 1 mile of Pier 96 are on the uplands and would also have no overlap with Project construction, with the exception of two planned projects located near the proposed trucking route to and from the MHF (Cargo Way to Third Street and Cesar Chavez Street to and from Interstate 280 or Jennings Street to Evans Avenue and Cesar Chavez Street to and from US 101). The 1550 Evans Avenue project would have no overlap with the timeline of work at Pier 96. The SFPUC Southeast Outfall Islais Creek Crossing Replacement would possibly overlap with the Pier 96 work and potential traffic impacts are described below.

Implementation of the Project would not result in cumulative impacts related to agricultural and forestry resources, population and housing, or public services because no potential impacts from the Project have been identified for these resource areas. Wildfire is a resource area that is not applicable to any project in this area, and thus, no cumulatively considerable impacts would occur.

Potential short-term construction-related impacts have been identified related to the remaining resource areas (aesthetics, air quality, biological resources, cultural and tribal cultural resources, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, recreation, transportation/traffic, and utilities and service systems). As discussed in the previous sections, implementation of compliance and monitoring plans, permit requirements, control measures, and mitigation measures (applicable to only a limited number of resource areas) would reduce the potential impacts related to these resource areas to a less-than-significant level. The potential for the Project to cause cumulatively considerable impacts related to these resource areas is discussed below in further detail.

Table 5-20.1. Projects within 1 Mile of Project Area (Pier 39 to 43½)

Project Name/Address	Project Description	Status/Project Impacts	Proximity (miles)
Pier 43½ at the Embarcadero: Red and White Fleet Expansion/Renovations	The proposed Red and White Fleet project would enhance existing business operations and delivery of public services as follows: Shoreside Improvements: Ticket booth facility; Passenger queuing and disembarking; guest photography and photographic sales; passenger loading and drop off zone; the presentation of educational interpretative displays; retail sales of merchandise; onboard food and beverage services; enhance general public circulation within the shoreline corridor;. Offshore Improvements: changes to vessel landings and berthing.	Red and White Fleet's current schedule is for work to occur between 2023 and 2025, with offshore work to be performed in coordination with remedial work in Area A.	Adjacent
Embarcadero Seawall Program	The project would repair and reinforce The Embarcadero Seawall to protect against the effects of sea level rise and seismic activity. The Embarcadero Seawall Program is not included in Figure 5-20.1 because specific areas that will be constructed near the Project Area are still to be determined.	Design and construction phase planned to begin in 2022-2023 but initially limited to immediate seismic and flood protection measures (emergency projects only including a Fisherman's Wharf site and Pier 1) are targeted for completion by 2026-28. It is possible that construction would overlap with the Project.	Adjacent
BayEcotarium	The proposed BayEcotarium project would demolish the existing Aquarium of the Bay located on Pier 39 and replace it with an enhanced aquarium including 3 acres of public access eco-park.	The proposed project is in the early stages of planning at this time and not included on SFEP's online map. Construction is not anticipated to occur until after the completion of the Project (2029).	Adjacent
2293 Powell St	The proposed project would remove an existing vacant structure previously containing ground floor restaurant and second floor office and merge two lots into single parcel. The project would construct a new 4-story over basement concrete structure with below grade parking, ground floor restaurant less than 5,000 net square feet and 17 dwelling units containing mix of one and two-bedroom units. The project would have a garage containing 17	The business plan was approved late 2017. This upland/inland work would not overlap with Pier 39-43½ project activities.	0.25 and upland

Table 5-20.1. Projects within 1 Mile of Project Area (Pier 39 to 43½)

Project Name/Address	Project Description	Status/Project Impacts	Proximity (miles)
	off-street parking spaces and 26 bicycle parking spaces.		
1196 Columbus Ave/ 2588 Jones St	The proposed project would demolish an existing one-story commercial building and construct a new 28,700 sf, six-story, 60-foot high building including 56 group housing rooms	The proposed project is currently under review. This is upland/inland work and would not overlap with Pier 39-43½ project.	0.45 and upland
Seawall Lot 322-1 located at 735 Davis Street and 88 Broadway	The project demolished a surface parking lot for the construction of two-six story buildings, one at 735 Davis Street for 100% affordable senior housing and the second at 88 Broadway for 100% affordable family housing. The project includes a variety of open spaces including two mid-block passages distributed throughout the structure.	The 735 Davis Street senior housing project began construction in 2019 and was completed in 2020. The 88 Broadway family housing project began construction in 2019 and will be completed in 2021. This upland/inland work would not overlap with Pier 39-43½ project.	0.81 and upland
Seawall Lots 323 and 324 - Teatro ZinZanni at The Embarcadero, Broadway, Davis and Vallejo Streets	The existing surface parking at Seawall Lots 323 and 324 will be demolished and the following constructed: new theater to serve as the permanent home for Teatro ZinZanni and its historic "Spiegeltent"; 192 room boutique hotel with ancillary retail and commercial spaces; 14,000 square foot park at the northern end of the site.	The project schedule is to begin construction in 2021 and complete construction in 2023. This upland/inland work would not overlap with Pier 39-43.5 project.	0.87 and upland

Table 5-20.2. Projects within 1 Mile of the Pier 96 MHF

Project Name/Address	Project Description	Status/Project Impacts	Proximity (miles)
City of San Francisco Recreation & Park Department Planned Dredging Project	San Francisco Recreation and Park Departments anticipates use of the Pier 96 MHF to process dredged sediments for up to two years/construction seasons.	This project anticipates dredging in 2025 and 2026, and would use the Pier 96 MHF when there is no work planned there for the Piers 39 to 43½ project. There would be no overlap.	At Pier 96 MHF
Herons Head Park Shoreline Resilience Project	Constructed in the 1970s from various fill material, Heron's Head Park provides critical intertidal shoreline habitat for native plant species and waterfowl, as well as a public access trail and educational opportunities associated with the wetlands and EcoCenter. The proposed project would place	Construction is scheduled to be performed in 2021 or 2022. Construction activity on land would be limited to the period between September 1 and January 31 in 2021 or 2022. This work would not overlap with Pier 96 work.	0.30 and at shoreline

Table 5-20.2. Projects within 1 Mile of the Pier 96 MHF

Project Name/Address	Project Description	Status/Project Impacts	Proximity (miles)
	approximately 12,000 cubic yards of coarse sand and gravel to construct a beach and berm along approximately 1,600 linear feet of the south-facing shoreline of the park to stabilize the eroding shoreline.		
200 Acacia Avenue	The proposed project would develop market-rate, mixed-income residential housing under the Mayor's HOPE SF initiative, spanning 22-acres with proposed homes ranging from 2 to 3 bedrooms, from 1,370 to 1,760 square feet with own private garage.	The Project Profile was accepted on 11/21/2019. No timeline is available at this time. This upland/inland work would not overlap with Pier 96 work.	0.56 and upland
1151 Fairfax Avenue	The proposed HOPE SF project would erect a 5-story, 76-unit residential/mixed used building and a 6-story, 1-basement, 42-unit residential/mixed used building.	The building plan was filed late 2019. This upland/inland work would not overlap with Pier 96 work.	0.57 and upland
Hunters View	The proposed project would demolish the 267 affordable housing units in 50 buildings and construct about 668 affordable units, 6,400 square feet of retail, and 739 parking spaces in 66 buildings. Buildings would range from two to five stories 20 to 50 feet in height. The project would be about 1,241,500 square feet.	The project is currently under construction and is set to begin Phase 3 of construction in 2021. This upland/inland work would not overlap with Pier 96 work.	0.60 and upland
1550 Evans Avenue	The proposed project would construct: a 3-story community center containing a childcare center, café, multi-purpose rooms, and offices; a 1-story community room pavilion; a 3-story education building with classrooms and administrative offices; surface parking with approximately 100 parking spaces and 40 bicycle spaces; and an outdoor amphitheater.	The business plan was filed in 2018 and construction scheduled to start in 2020 and end in 2023. This upland/inland work would not overlap with Pier 96 work.	0.61 and upland
SFPUC, Southeast Outfall Islais Creek Crossing Replacement (near 602 Arthur Avenue)	The proposed project would replace two parallel pipelines that comprise the Southeast Bay Outfall Islais Creek Crossing and install two new permanent high-density polyethylene and steel pipelines beneath and immediately adjacent to Islais Creek. The remaining in-service ductile iron pipeline beneath Islais Creek would be abandoned in place and the temporary bypass pipeline would be removed. Construction would require temporary closure of Islais Creek Park and Tulare Park.	The project is under Review. Construction would require an approximately 3.5-year period and may begin in 2021-2022, and take approximately 27 months of active construction. It is possible that construction would overlap with the Pier 96 work.	0.61 and upland

Table 5-20.2. Projects within 1 Mile of the Pier 96 MHF

Project Name/Address	Project Description	Status/Project Impacts	Proximity (miles)
India Basin (at and adjacent to 900 Innes Avenue)	San Francisco Recreation and Parks 900 Innes Avenue Remediation Project is the first phase of the India Basin Parks project to prepare the Site for redevelopment into a public park. Remedial construction activities will occur on land, as well as within the shallow waters lying immediately to the north of 900 Innes Avenue. The proposed offshore remediation activities include the removal of debris and dilapidated structures, followed by targeted dredging of between 4 and 5 feet within the intertidal and subtidal zone, installation of a coffer dam, and placement of an equivalent backfill. Possible offloading of dredged sediments to rail in upland area of Pier 96.	Project permits have been obtained and work is anticipated to begin in 2021 with upland site clearing, followed by in-water work in June-August. Completion of remedial activities anticipated by 2022, thus would not overlap with Pier 96 work.	0.70 and upland
818 Innes Avenue	The proposed project would construct a new four-story mixed-use building with ground floor commercial, subterranean storage and residential on the top three floors.	Planning entitled; business plan was approved in early 2019. This upland/inland work would not overlap with Pier 96 work	0.75 and upland
700 Innes Avenue	The proposed project is a multi-phase development with up to 1,575 residential units, approximately 209,100 square feet of commercial/retail space, 1,800 parking spaces, and 1,575 bicycle parking spaces. The project would also include a total of about 24.5 acres of open space, some of which would be located on the 700 Innes Avenue property.	The Project issued a Notice of Determination in 2018. This upland/inland work would not overlap with Pier 96 work.	0.86 and upland
4101 3rd Street	The proposed project would demolish the existing vacant lot, remove an existing general advertising sign, and construct an approximately 36,130-square-foot, 60-foot-tall, five-story mixed-use residential building. The building would include 32 dwelling units and approximately 3,780 square feet of ground-floor and mezzanine-level single retail space fronting Third Street.	The planning permit was approved in 2018. This Upland/inland work would not overlap with Pier 96 work.	0.89 and upland
SFPUC, Southeast Wastewater Treatment Plant Headworks Project (near 1800 Jerrold Avenue)	The proposed project would replace existing headworks facility with new headworks facility, modify the Bruce Flynn Pumping Stations, and replace the Southeast Lift Station.	The Project is set to begin in early 2021 and is currently scheduled for five years. Upland/inland work. It is likely that the construction timeline	0.97 and upland

Table 5-20.2. Projects within 1 Mile of the Pier 96 MHF

Project Name/Address	Project Description	Status/Project Impacts	Proximity (miles)
		would overlap with the Project.	

Aesthetics

As discussed in Section 5.1, construction activities for the Project would introduce equipment for remedial construction activities that could partially block some views of the Bay and the Pier 43 Ferry Arch on a temporary basis. Projects in close proximity to the Project Area have the potential to result in similar impacts on visual resources. The Project activities and activities of other planned projects would not result in permanent changes to views of the Bay or the Pier 43 Ferry Arch, and temporary impacts on views during construction would only be partial obstruction of the Bay and compatible with other uses in the area. For these reasons, the Project, in combination with other past, present, and reasonably foreseeable projects, would not contribute to a significant cumulative aesthetics impact.

Air Quality

As discussed in Section 5.3, sensitive receptors located near the Project Area, Pier 96 and Berth 10 would be exposed to short-term emissions of TACs due to equipment usage during remedial construction activities, transport of materials, workers and dredged materials and material handling. Since the primary TAC of concern for the project is DPM from diesel-fueled construction equipment and it is reasonable to assume that surrounding projects will also be using this equipment, construction equipment air emissions could be a potentially significant cumulative impact. Projects in close proximity to the Project Area and MHF such as the Red and White Fleet expansion, the Embarcadero Seawall program, and the Islais Creek Outfall Repair have the potential to result in similar impacts on air quality.

Emissions from past, present, and future projects contribute to the region's adverse air quality on a cumulative basis. No single project by itself would be sufficient in size to result in regional non-attainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulative adverse air quality impacts (BAAQMD 2010). The project-level thresholds for criteria air pollutants are based on levels by which new sources are not anticipated to contribute to an air quality violation or result in a considerable net increase in criteria air pollutants.

The BAAQMD has developed CEQA Air Quality Guidelines that establish significance thresholds for evaluating new projects and plans and provides guidance for evaluating air quality impacts of projects and plans (BAAQMD 2017a). These Air Quality Guidelines provide procedures and significance thresholds for evaluating potential construction-related impacts during the environmental review process consistent with CEQA requirements. By adhering to these guidelines as well as implementing the plans, control measures and AMMs described in Section 5.3 and Attachment A, the Project, in combination with other past, present, and reasonably foreseeable projects, would not contribute to a significant cumulative air quality impacts.

Biological Resources

As discussed in Section 5.4 and section (a) above, the Project could affect special status fish, bird, mammal and invertebrate communities, as well as sensitive natural communities. In-water remedial construction activities have the potential to result in temporary impacts on special status aquatic species through water quality impacts, increases in underwater noise, and disturbance and alteration of intertidal and subtidal habitats. However, implementation of Mitigation Measures BIO-1A, BIO-1B, BIO-3 and BIO-4, along with the requirements of resource agency permits and elements of the plans, control measures and AMMs discussed in Section 5.4 and Attachment A, would reduce potential impacts to special status species and their habitat to less than significant.

Projects in close proximity to the Project Area and MHF such as the Red and White Fleet expansion, the Embarcadero Seawall program, and the Islais Creek Outfall Repair have the potential to result in similar impacts on biological resources. These projects may have similar in-water activities as the Project such as debris removal, cap/armor installation, and pile driving/removal. It is expected that these projects would have similar mitigation measures and would adhere to relevant resource agency permit requirements. Thus, the Project, in combination with other past, present, and reasonably foreseeable projects, would not contribute to a significant cumulative biological resource impacts on special status species or habitat.

Cultural and Tribal Cultural Resources

As discussed above in section (a) and in Section 5.5, potential impacts on cultural and tribal cultural resources could occur in the unlikely event that artifacts are discovered during Project remedial construction activities. These potential impacts would be reduced to less than significant with the implementation of mitigation measures CUL-1 and CUL-2 and control measures described in Section 5.5 and Attachment A.

Project-related impacts on archaeological resources, tribal cultural resources, and human remains are site-specific and generally limited to a project's construction area. The Red and White Fleet's expansion would potentially overlap the same construction area; however, given the results of the cultural resources assessment (Attachment D), that project is unlikely to result in any disturbance of or impact on cultural or tribal cultural resources. The seawall project would also potentially overlap the same construction area, but it would have its own cultural resources assessment completed to address any potential impacts. For these reasons, the Project in combination with other past, present, and reasonably foreseeable future projects would not have a significant cumulative impact on archaeological resources, tribal cultural resources, or human remains.

Energy

As discussed in Section 5.6, fuel consumption associated with vehicle trips generated by the Project would not be considered inefficient, wasteful, or unnecessary in comparison to other similar projects in the region. Additionally, the Project would not directly use electricity for remediation-related operations. With implementation of the plans, control measures and AMMs discussed in Section 5.6 and Attachment A, the Project would not place a large demand on energy resources during construction and remediation. The Project would be temporary would not result in operational-related energy increases. For these reasons, the Project, in combination with other past, present, and reasonably foreseeable future projects, would not have a significant cumulative impact on energy resources.

Geology and Soils

As discussed in Section 5.7, the Bay Area, including the Project Area, would be subject to ground shaking in the event of an earthquake on one of the regional faults. Pile replacement is the only Project activity that could have an impact related to ground shaking. The Project would not exacerbate ground shaking or expose people or structures to substantial adverse effects related to ground shaking because the pile replacements would be constructed in accordance with the most current Port of San Francisco Building Code, which incorporates California Building Code requirements. Another potential impact would be slope stability during dredging; however, any activities that would potentially destabilize soft sediments would adhere to geotechnical engineering recommendations for slope stability. The Project would not involve the construction of permanent structures or addition of people (other than temporary construction workers) that could be exposed to seismic-related ground failure, landslides, soil erosion, or soils that would not adequately support Project activities. The Project Area has little or no potential to contain paleontological resources and does not contain any unique geological resources.

Although the entire Bay Area is located within a seismically active region with a high risk of seismic hazards and a wide variety of geologic conditions, the geographic scope of potential cumulative geology and soils impacts is restricted to the Project Area and immediate vicinity because related risks are relatively localized or even site-specific. All other development in San Francisco, including those projects listed in Tables 5-20.1 and 5-20.2 would be subject to the same or equivalent regulatory framework as the Project, which would ensure that these projects would not collectively increase seismic or erosion hazards. For the above reasons, the Project, in combination with other past, present, and reasonably foreseeable projects, would not contribute to a significant cumulative impact on geology and soils.

Greenhouse Gas Emissions

As discussed in Section 5.8, the Project would result in increased GHG emissions due to equipment usage during remedial construction activities. However, no single project by itself could generate enough GHG emissions to noticeably change the global climate. Instead, the combination of GHG emissions from past, present, and future projects has, or may, contribute cumulatively to global climate change. Therefore, the evaluation of whether the Project's GHG emissions were significant on a project level was based on whether the GHG emissions would be considered cumulatively considerable. The maximum emissions from this Project would be about 0.12 percent of the community-wide emissions, and the GHG emissions from remediation-related activities would not be permanent. For these reasons, and with the implementation of plans, control measures and AMMs described in Section 5.8 and Attachment A, the Project's GHGs would not be cumulatively considerable and the impact would be less than significant.

Projects in close proximity to the Project Area and MHF such as the Red and White Fleet expansion, the Embarcadero Seawall program, and the Islais Creek Outfall Repair have the potential to result in increases in GHG emissions. These projects would have similar activities including equipment usage and transport of materials and workers that could generate GHGs. In addition, there would be operational-related long-term energy demands that would be associated with the Red and White Fleet expansion. These projects would be required to comply with the relevant GHG reduction plans that are intended to reduce GHG emissions below current levels. For these reasons, the Project in combination with other past, present, and reasonably foreseeable future projects would not have a significant cumulative impact on GHG emissions.

Hazards and Hazardous Materials

As discussed in Section 5.9, the Project Area is known to contain PAH-contaminated sediment in the subsurface. The Project activities could result in direct exposure of construction workers to hazardous material in the subsurface or the release of contaminants into the air in the form of vapors or fugitive dust. Other hazardous materials that would be present periodically during the remedial activities include fuels and lubricants. All materials and waste would be handled and transported properly, following standard in-water equipment and construction practices, to minimize releases to the environment and properly disposed of following state and federal regulations. In addition, the potential for the release of hazardous materials into the environment would be thoroughly managed through the implementation of the plans, control measures and AMMs detailed in Attachment A, as well as conditions contained in the necessary permits and approvals (described in Section 5.9). There would be no impacts on schools, airports, or local emergency response plans, and the Project is not located on a Cortese list site or in an area at risk of wildfire. Therefore, hazards to the public or environment would be less than significant.

Projects listed in Tables 5-20.1 and 5-20.2 would likely use similar hazardous materials associated with construction, such as oils, grease, and fuels. In order for a cumulative effect to occur, multiple projects would need to release hazardous materials at the same time in close proximity to each other. Each project, including the Project, would be required to comply with applicable hazardous materials regulations and implement safety measures and compliance with the OSHA requirements for worker health and safety to reduce the risk of hazardous materials release. Any contribution from the Project to contamination that may be released from other sites would not be cumulatively considerable because of the plans, control measures and AMMs incorporated into the Project to minimize or eliminate migration of contaminants to off-site locations. For these reasons, the Project in combination with other past, present, and reasonably foreseeable future projects would not have a significant cumulative impact on the environment or people from the use of hazardous materials.

Hydrology and Water Quality

As discussed in section 5.10, Project remedial construction activities may result in temporary increases in PAHs, turbidity and other water quality impacts from disturbance of the sediment. There are no streams or rivers present in the Project area or the adjacent upland area, and no impervious surfaces would be added. There would be a temporary increase in surface water runoff at the MHF from construction activities and a potential for associated increases in siltation from installation and removal of the transload deck. Implementation of plans, control measures and AMMs detailed in Attachment A, as well as conditions contained in the necessary permits and approvals, would ensure that surface runoff would not exceed the capacity of existing or planned stormwater drainage systems, provide substantial additional sources of polluted runoff, result in flooding on- or offsite, or substantially alter ambient conditions.

Disturbance of subsurface sediment due to various construction activities would also occur as part of the Islais Creek stormwater outfall pipe replacement work, but the impacts would be limited to the immediate project vicinity, several miles to the south of the sediment disturbance in the Project Area. No other projects in Tables 5-20.1 and 5-20.2 would disturb sediment.

Stormwater runoff from construction of the projects listed in Table 5-20.1 could potentially result in similar impacts to stormwater quality and quantity as the Project. The Red and White Fleet expansion includes expansion of structures on Pier 43½ that could change the current stormwater drainage. Stormwater quality regulations require all construction projects to manage and treat all significant sources of stormwater pollutants and any additional runoff. Compliance with regulatory requirements would ensure that each project would minimize the contribution of pollutants to and volume of stormwater to levels that would not result in cumulatively considerable impacts on water quality or hydrology. For these reasons, the Project in combination with other past, present, and reasonably foreseeable future projects would not have a significant cumulative impact on water quality or hydrology.

Land Use and Planning

As discussed in Section 5.11, placement of the cap would limit future dredging depths, and ICs implemented as part of the remedy (e.g., restrictions on the use of anchors or other activities that could disturb sediments in select areas; speed restrictions; and limits on future maintenance dredging, in addition to the current; and limitations and existing restrictions on Port tenants and mariners) could affect future tenants' use of the Project Area. Though there may be impacts in relation to tenant uses of the Project Area, compliance with the Bay Plan will ensure that the impacts to an applicable land use plan, policy, or regulation would be less than significant.

Most of the projects listed in Tables 5-20.1 and 5-20.2 that are immediately adjacent to the Project Area or MHF are commercial and residential development projects that could result in the intensification of land uses in the Project vicinity; however, they are infill projects that would not physically divide an established community by constructing a physical barrier to neighborhood access, such as a new freeway, or remove a means of access, such as a bridge or roadway. All projects would be reviewed by the San Francisco Planning Department and BCDC to ensure compliance with policies of the Bay Plan (including BCDC's environmental justice policies) and the San Francisco Planning Code to ensure that each project would not have cumulatively considerable impacts on the Bay or in relation to any applicable land use plans or policies. For these reasons, the Project in combination with other past, present, and reasonably foreseeable future projects would not have a significant cumulative impact on land use.

Mineral Resources

As discussed in Section 5.12, the Project Area is not located in or near a locally important mineral resource recovery site. The quantity of backfill material needed is small and the use of this material as backfill will be consistent with its intended uses and will not exceed permitted limits. The projects listed in Tables 5-20.1 and 5-20.2 would not use similar mineral resources. Therefore, the Project in combination with other past, present, and reasonably foreseeable future projects would not have a significant cumulative impact on mineral resources.

Noise

As discussed in Section 5.13, remediation activities could temporarily cause an increase in noise levels in the Project Area and at the MHF. These impacts would be temporary and, with the implementation of the plans, control measures, and AMMs detailed in Attachment A, as well as conditions contained in the necessary permits and approvals, Project-related noise and groundborne vibration would be less than significant.

Reasonably foreseeable future development in the immediate vicinity of the Project Area consists of the projects listed in Table 5-20.1. While the noise impact from the Project was found to be less than significant, projects in the near vicinity with overlapping schedules could compound the noise impact. Because noise generally dissipates at a rate of 7 dBA for every 50 feet beyond the initial 50 feet distance from the work area, only the three adjacent projects identified on Figure 5-20.1 are considered near enough to reasonably result in a cumulative noise impact: the Red and White Fleet expansion, the Embarcadero Seawall program, and the Islais Creek Outfall Repair.

All of the aforementioned projects would be required to meet all applicable construction noise standards established in the San Francisco Noise Ordinance (Article 29 of the Police Code). Because sound pressure levels expressed in decibels are based on a logarithmic scale, they cannot be added or subtracted in an arithmetical way (OSHA 2005). Combining two noise sources, both producing noise at the same level, will not result in a doubling of the noise level. In general, if the difference between two noise sources is 0 to 1 dBA (i.e., the two sources are almost equal), the resultant noise level would be 3 dBA higher than the higher noise source. If the difference between two noise sources is 2 to 3 dBA, the resultant noise level would be 2 dBA above the higher noise source. If the difference between two noise sources is 4 to 10 dBA, the resultant noise level would be 1 dBA higher than the higher noise source. If the difference between two noise sources is 10 dBA or more, the higher noise source will dominate and the resultant noise level will be equal to the noise level of the higher noise source.

The Project Area includes fishing vessel and ferry docks, and a high concentration of visitor-related commercial development. The adjacent uplands are composed of densely developed commercial areas. The MHF is industrial and has an elevated ambient noise level from transportation sources and, the additive properties of noise limit do not result in substantial increases from two similar noise sources. For these reasons, the Project in combination with other past, present, and reasonably foreseeable future projects would not have a significant cumulative noise impact.

Recreation

As discussed in Section 5.16, the Project would temporarily disrupt or modify the operation of recreational businesses such as excursions to accommodate construction in the Project Area. Mitigation Measure REC-1 describes a plan that would be developed in close coordination with the relevant stakeholders that would ensure that the cumulative impacts on recreation from the Project and the proposed expansion of the Red and White Fleet's operations at Pier 43½ would be less than significant.

Other projects listed in Tables 5-20.1 and Table 5-20.2 that are residential in nature may have minor impacts on recreational facilities due to increases in population and demand for recreational facilities.

However, the Project in combination with other past, present, and reasonably foreseeable future projects would not have a significant cumulative impact on recreation.

Transportation

As discussed in Section 5.17, the Project would temporarily disrupt or modify the operation of the Blue & Gold Fleet which operates at Pier 41½. Mitigation Measure TRANS-1 describes a plan that would be developed in close coordination with stakeholders that would ensure that cumulative impacts on transportation from the Project would be less than significant. With the implementation of plans, control measures, and AMMs detailed in Attachment A, the Project would result in less than significant impacts related to VMT and parking, intersection LOS, traffic safety hazards, and inadequate emergency access. The Project would not have any impacts on air traffic patterns. Therefore, impacts on transportation would be less than significant.

Construction access routes for the Project could potentially overlap with those for some projects listed in Tables 5-20.1 and 5-20.2. However, given the limited addition of traffic volumes and short duration, the Project's contribution to any cumulative impacts to VMT and parking; intersection LOS; traffic safety hazards; emergency access; and policies, plans or programs related to public transit, bicycle, and pedestrian facilities would not be cumulatively considerable. For these reasons, the Project in combination with other past, present, and reasonably foreseeable future projects would not have a significant cumulative impact.

Utilities and Service Systems

As discussed in Section 5.19, the Project would not include the construction of new or expanded utility facilities. Temporary utility relocation is possible during construction activities but relocation would not cause significant environmental effects. Temporary power and decant water treatment facilities would be necessary for the MHF and sediment dewatering activities. The plans, control measures and AMMs described in Attachment A summarize the approaches for processing sediment decant water and other construction water as well as specific approaches for managing waste materials. The Project would not significantly increase the amount or pollutant load of stormwater runoff or sanitary sewer flows.

The projects listed in Tables 5-20.1 and 5-20.2 would have much larger, and permanent impacts on utilities compared to the Project as they would add population and building space that must be serviced by sewer, potable water, and waste management services. Those projects would be required to comply with all applicable regulations that prevent conditions that would exceed wastewater, stormwater or waste treatment capacity, decrease the available water supply. For these reasons, the Project in combination with other past, present, and reasonably foreseeable future projects would not have a significant cumulative impact on utilities.

c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly (***Less Than Significant Impact***)?

No significant environmental effects have been identified that could directly or indirectly cause adverse effects on human beings. As discussed in Section 5.3 and Section 5.9, sensitive receptors could be exposed to short-term emissions of TACs while remediation activities take place and Project activities could result in direct exposure of construction workers to hazardous material in the subsurface or the release of contaminants into the air in the form of vapors or fugitive dust. A site-specific Health and Safety Plan would be developed for the Project, and all Project personnel would be required to review and comply with the plan. The Health and Safety Plan would include an Air Monitoring and Sampling Plan to monitor and document conditions in the work zone. In addition, an Ambient Perimeter Air Monitoring Plan and Dust, Vapor, and Odor Control Plan would be prepared that address air quality, dust, and odor control at the perimeter of the work zone to protect nearby receptors. Implementing the Health and Safety Plan, Dust, Vapor, and Odor Control Plan, and Ambient Perimeter Air Monitoring Plan would ensure and document that field activities have been conducted in a manner protective of workers, other site personnel, and human beings in the immediate surrounding areas. Measures within the Dust, Vapor, and Odor Control Plan would ensure that BAAQMD requirements for dust control are followed and that air emissions from operations are in compliance with health protective thresholds. Implementation of compliance and monitoring plans and control measures described in Attachment A would reduce potential project-related impacts on human beings to less than significant.

References:

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6. Port of San Francisco. 2020. Mission Rock and Pier 48. February 2020.
7. Port of San Francisco. No date. Seawall Program Factsheet. Waterfront Resilience Program.
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6 MITIGATION MEASURES

The following mitigation measures have been identified to reduce potentially significant impacts resulting from the Proposed Project to a less-than-significant level. All relevant stakeholders or their designated agent(s) will implement these measures as part of the Proposed Project, upon approval of the Regional Water Board.

6.1 Biological Resources

6.1.1 Mitigation Measure BIO-1A

In-water work activities may not be conducted during the December 1 to March 15 Pacific herring spawning season. As the spawning season approaches (month of November), a trained biologist shall monitor the waters within a specified distance of in-water Project activities for spawning event indicators (e.g., presence of milt in the water, active surface predation of herring by birds or marine mammals) and/or conduct herring egg surveys. If required, work shall be stopped if a spawning event is detected in the immediate vicinity of in-water work and shall not resume until spawning has ended and herring embryos have hatched.

6.1.2 Mitigation Measure BIO-1B

A hydroacoustic assessment shall be completed to determine which construction activities may produce sounds levels that could result in take of listed fish species. Based on assessment findings, appropriate measures (e.g., sound attenuation or work window restrictions) shall be incorporated into project authorization requests. All avoidance measures, monitoring, reporting, timing, and work limit requirements established within the agency consultation and/or authorization shall be fully implemented. Any identified compensatory mitigation shall be completed consistent with agency consultation and authorization requirements.

6.1.3 Mitigation Measure BIO-2

Project activities that could impact nesting birds will be scheduled to greatest extent practicable to avoid the nesting season (February 1 to August 31). If it is not possible to schedule such activities to occur between September 1 and January 31, a pre-construction nesting bird survey of all suitable nesting habitat within the zone of influence shall be conducted by a qualified biologist within 7 days prior to commencement of construction activities, scheduled to occur within the nesting season. The zone of influence would include the area immediately surrounding the work location that supports suitable nesting habitat that could be affected by the Project due to visual or auditory disturbance associated with construction activities scheduled to occur during the nesting season. If no nesting birds are observed during the survey, construction activities may commence as planned.

If nesting birds are observed during the survey, the qualified biologist shall review results with the Project sponsor and contractor, evaluate whether the schedule of construction activities could affect the active nests, and recommend measures to the project biologist based the PG&E Nesting Bird Management Plan, which could include establishing a non-disturbance buffer (e.g., 50 feet for non-raptors and 250 feet for raptors). This buffer would remain in place until such a time as the young have been determined (by a qualified biologist) to have fledged. These buffers may be modified (e.g., by reducing their size or installing a blind) as deemed appropriate by the project biologist in coordination with USFWS and CDFW.

A brief survey report documenting the preconstruction survey area and findings shall be prepared by the qualified biologist and submitted to the Project sponsor prior to initiation of construction during the nesting season. The report shall document presence or absence of any active nests and prescribe a suitable non-disturbance buffer if active nests are present and could be disturbed by Project-related activities. No report of findings is required if construction is initiated during the non-nesting season (September 1 to January 31) and continues uninterrupted according to the above criteria.

If any birds begin nesting within active work areas after construction has commenced, they will be nesting in an environment with high levels of existing and ongoing disturbance and a no work exclusion buffer shall be established around the active nests. However, a qualified biologist shall monitor the nest twice a week. If the qualified biologist determines that birds are showing signs of distress associated with construction (e.g., frequent vocalization or flushing from the nest), a non-disturbance buffer shall be established as determined by the qualified biologist.

6.1.4 Mitigation Measure BIO-3

Prior to construction, a native oyster survey will be completed. If oysters are within or immediately adjacent to the Project Area, it shall first be determined whether avoidance of the beds is feasible. If feasible, impacts on the oyster bed shall be avoided. If complete avoidance is not feasible, the Project sponsor shall request guidance from NMFS regarding the need for and/or feasibility of moving affected beds. Translocation of oyster beds shall be consistent with methods and recommendations presented in Shellfish Conservation and Restoration in San Francisco Bay: Opportunities and Constraints (Zabin et al. 2010).

6.1.5 Mitigation Measure BIO-4

A hydroacoustic assessment shall be completed to determine which construction activities could produce sounds levels that could result in harassment of marine mammals (Level A or B). Based on assessment findings appropriate measures (e.g., monitoring during specified work activities with stop work authority) shall be incorporated into an IHA or Letter of Authorization (for MMPA and FESA protected species). All monitoring, reporting, timing, and work limit requirements established within the project authorizations shall be fully implemented. Any identified compensatory mitigation shall be completed consistent with agency consultation and authorization requirements.

6.2 Cultural and Tribal Cultural Resources

6.2.1 Mitigation Measure CUL-1

In the unlikely event that previously unidentified archaeological, cultural, tribal cultural, or historical sites, artifacts, or features are uncovered during remediation, beyond the structural remnants previously identified, recorded, and evaluated, work shall be suspended within 100 feet (30 meters) of the find and redirected to another location. A qualified professional archaeologist shall be contacted immediately to examine the discovery. Project personnel shall not collect cultural resources. If the discovery can be avoided or protected and no further impacts would occur, the resource shall be documented on California Department of Parks and Recreation 523 forms, and no further effort shall be required.

If the resource cannot be avoided and may be subjected to further impacts, PG&E or its representative shall evaluate the significance of the discovery following federal and state laws outlined above and implement data recovery or other appropriate treatment measures if warranted. Evaluation of historical-period resources shall be done by a qualified historical archaeologist, whereas evaluation of prehistoric resources shall be done by a qualified archaeologist specializing in California prehistoric archaeology. If tribal cultural materials are present, the archaeologist shall contact and coordinate with the relevant Tribal Historic Preservation Officer(s). Evaluations may include archival research, oral interviews, and/or field excavations to determine the full depth, extent, nature, and integrity of the deposit.

6.2.2 Mitigation Measure CUL-2

If human remains are encountered, all work shall stop in the immediate vicinity (within 100 feet) of the discovered remains and the County Coroner (or the City and County of San Francisco Medical Examiner) shall be notified. In addition, a qualified archaeologist shall be notified immediately so that an evaluation can be performed. If the remains are deemed to be Native American and prehistoric, the Coroner must contact NAHC so that a “Most Likely Descendant” can be designated and further recommendations regarding treatment of the remains can be provided.

If the remains are not Native American, the Coroner will consult with the archaeologist and the Lead Agency to develop a procedure for the proper study, documentation, and ultimate disposition of the remains. If a determination can be made as to the likely identity of the remains—either as an individual or as a member of a group—an attempt shall be made to identify and contact any living descendants or representatives of the descendant community. As interested parties, these descendants may make recommendations to the owner, or representative, for the treatment or disposition, with proper dignity, of the remains and grave goods.

6.3 Recreation

6.3.1 Mitigation Measure REC-1

The Project sponsor/ applicant (PG&E) and co-applicant (Port) shall coordinate with all relevant stakeholders (Red and White Fleet, Blue & Gold Fleet, and other recreational businesses affected by construction activities) to develop a plan to address impacts on recreational boating businesses as a result of construction activities. The plan shall discuss how stakeholders and contractors will coordinate and phase construction activities and/or find alternative options (e.g., temporary relocation of businesses, alternate berthing locations) to minimize impacts. In addition, the Project sponsor/applicant and co-applicant shall work with stakeholders to facilitate communication to the public of any changes to recreational business offerings and schedules in the Project Area well in advance of such changes.

6.4 Transportation

6.4.1 Mitigation Measure TRANS-1

The Project sponsor/ applicant (PG&E) and co-applicant (Port of San Francisco) shall coordinate with all relevant stakeholders (e.g., Blue & Gold Fleet and WETA) to develop a plan to address transportation-related impacts on commuter ferry service as a result of construction activities. The plan shall address how stakeholders and contractors will coordinate and phase construction activities and/or find alternative options (e.g., temporary relocation of ferry services, alternate berthing locations) to minimize impacts on commuter ferry service. In addition, the Project sponsor/applicant and co-applicant shall work with stakeholders to facilitate notifications and communications to the public (e.g., online updates) of any ferry service schedule and berthing location changes well in advance of such changes.

7 DETERMINATION OF APPROPRIATE ENVIRONMENTAL DOCUMENT

On the basis of this initial evaluation:

☐ I find that the proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION 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 to 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.

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

☐ I find that although the proposed Project could have a significant effect on the environment, because all potentially significant effects (1) have been analyzed adequately in an earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION pursuant to applicable standards, and (2) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed Project, nothing further is required.

Certification:

___________________________	___________________________
Ross Steenson	Date
San Francisco Bay Regional Water Quality Control Board	

8 REPORT PREPARATION

This Initial Study and Mitigated Negative Declaration was prepared under the direction of Integral Consulting Inc. and its subconsultants with support from the Port of San Francisco and the Regional Water Board. This IS/MND reflects the independent review, analyses and judgment of the Regional Water Board, as the lead agency for the Project. Project participants included:

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9 REFERENCES

(*References cited in Section 5 are included at the end of each subsection.*)

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Figures

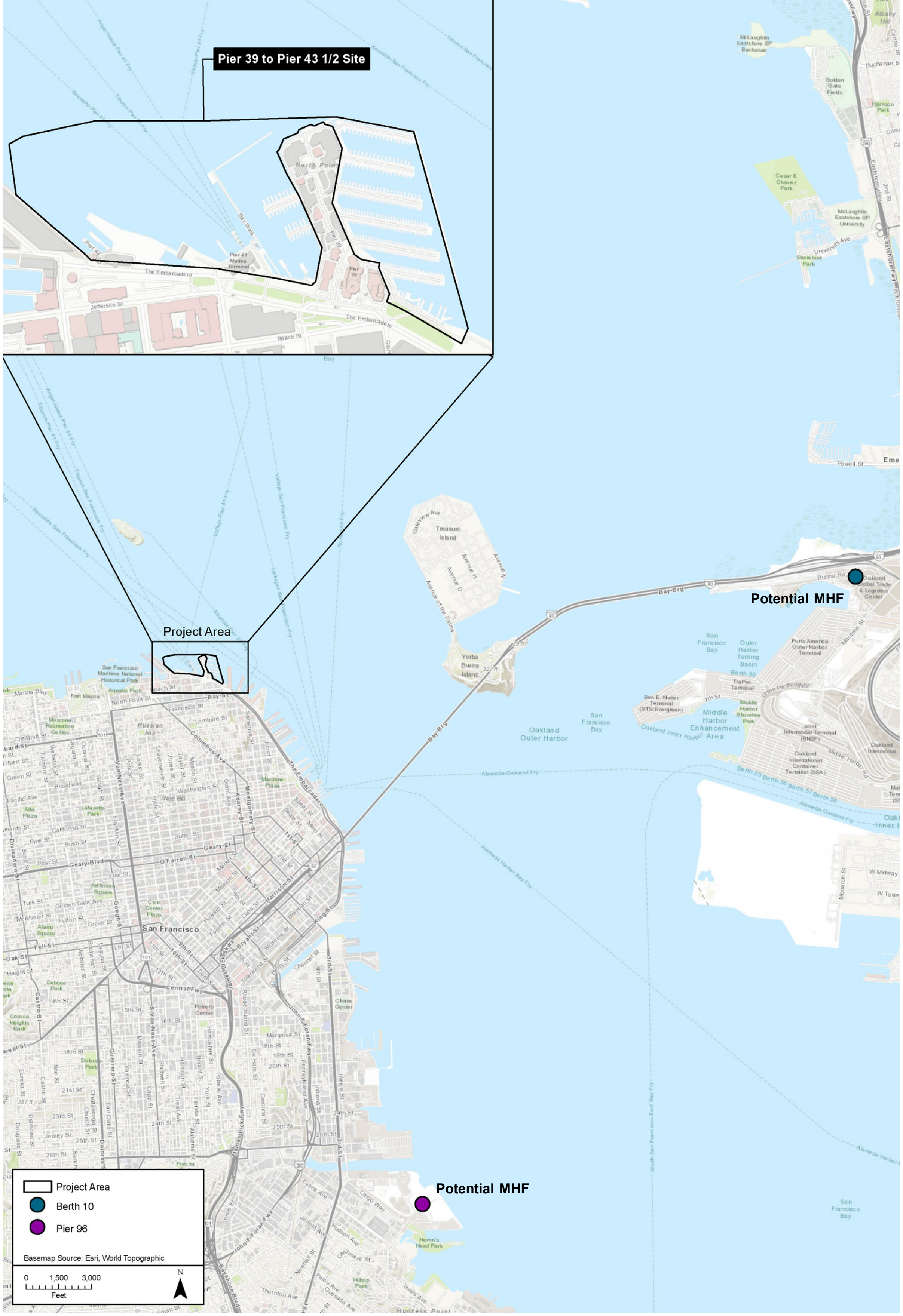


Figure 2-1

Project Location Map

Source: *Haley & Aldrich 2021, Figure 1*

Notes
1. Multibeam bathymetry data collected 2019: Some portions of the investigation area could not be imaged due to obstructions or insufficient water depths.

Figure 2-2

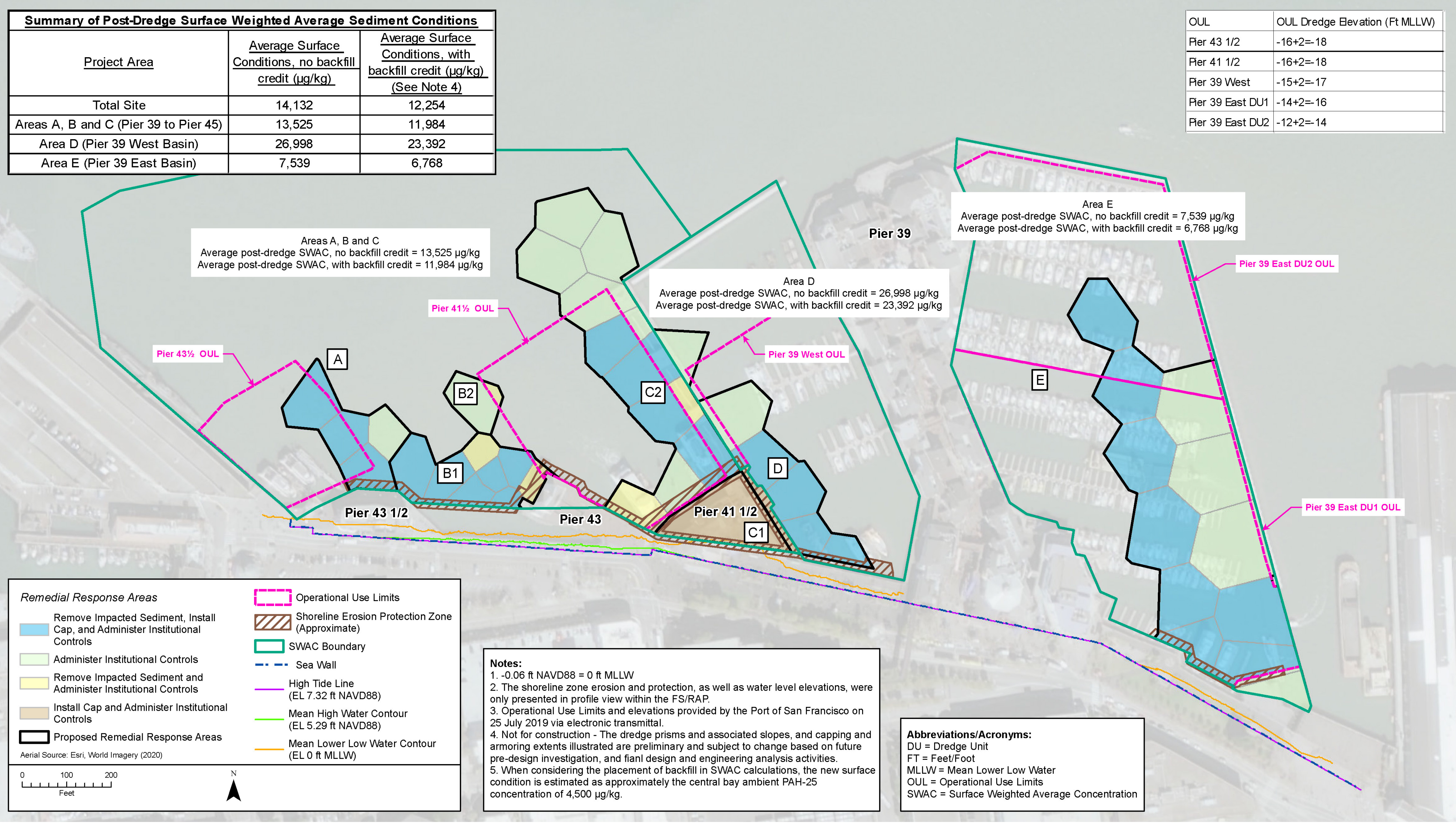
Project Area Map

Source: *Haley & Aldrich 2021, Figure 2*

Figure 3-1

Project Area Land Uses and Operational Use Limits

Source: *Haley & Aldrich 2021, Figure 3 and 5*



Summary of Post-Dredge Surface Weighted Average Sediment Conditions

Project Area	Average Surface Conditions, no backfill credit (µg/kg)	Average Surface Conditions, with backfill credit (µg/kg) (See Note 4)
Total Site	14,132	12,254
Areas A, B and C (Pier 39 to Pier 45)	13,525	11,984
Area D (Pier 39 West Basin)	26,998	23,392
Area E (Pier 39 East Basin)	7,539	6,768

OUL	OUL Dredge Elevation (Ft MLLW)
Pier 43 1/2	-16+2=-18
Pier 41 1/2	-16+2=-18
Pier 39 West	-15+2=-17
Pier 39 East DU1	-14+2=-16
Pier 39 East DU2	-12+2=-14

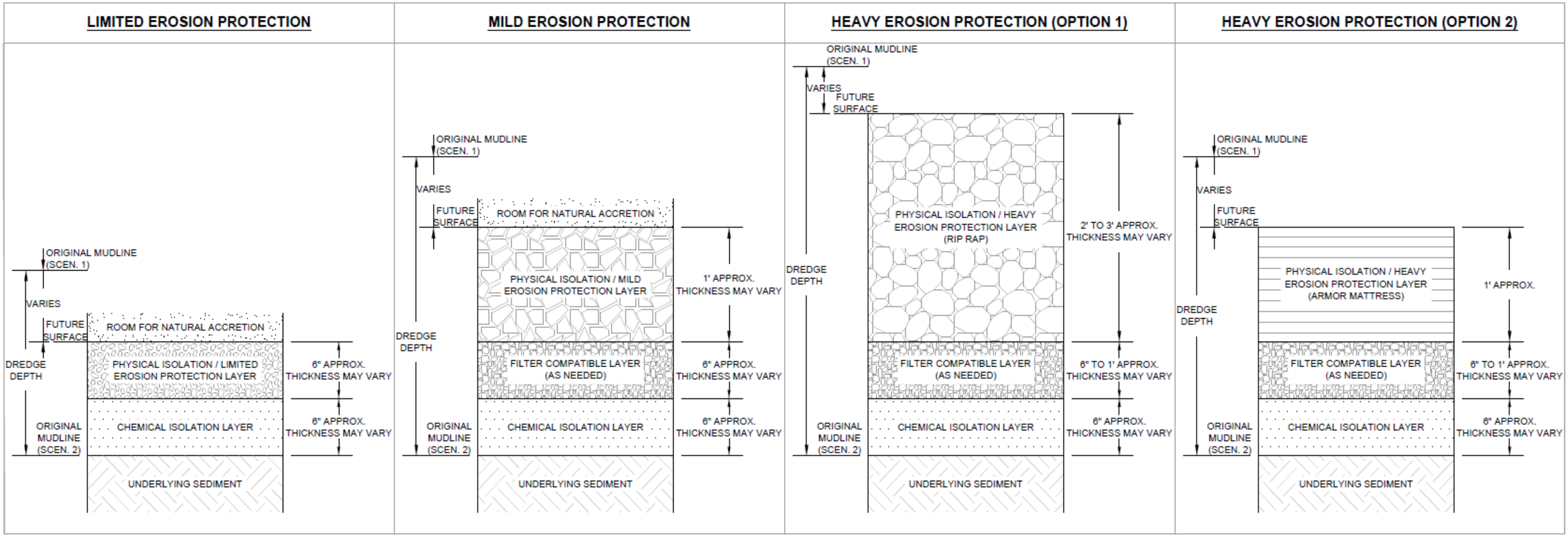
Notes:
1. -0.06 ft NAVD88 = 0 ft MLLW
2. The shoreline zone erosion and protection, as well as water level elevations, were only presented in profile view within the FS/RAP.
3. Operational Use Limits and elevations provided by the Port of San Francisco on 25 July 2019 via electronic transmittal.
4. Not for construction - The dredge prisms and associated slopes, and capping and armoring extents illustrated are preliminary and subject to change based on future pre-design investigation, and fianl design and engineering analysis activities.
5. When considering the placement of backfill in SWAC calculations, the new surface condition is estimated as approximately the central bay ambient PAH-25 concentration of 4,500 µg/kg.

Abbreviations/Acronyms:
DU = Dredge Unit
FT = Feet/Foot
MLLW = Mean Lower Low Water
OUL = Operational Use Limits
SWAC = Surface Weighted Average Concentration

Figure 3-2

Remedial Response Areas

Source: *Haley & Aldrich 2021*, *Figures 11, C2-a and 13*



LEGEND

- UNDERLYING SEDIMENT
- CHEMICAL ISOLATION LAYER
- PHYSICAL ISOLATION/LIMITED EROSION PROTECTION LAYER
- FILTER COMPATIBLE LAYER
- PHYSICAL ISOLATION/MILD EROSION PROTECTION LAYER
- PHYSICAL ISOLATION/HEAVY EROSION PROTECTION LAYER (RIP RAP)
- PHYSICAL ISOLATION/HEAVY EROSION PROTECTION LAYER (ARMOR MATTRESS)
- NATURAL ACCRETION

NOTES

1. ALL CAP LAYERS AND DIMENSIONS ARE APPROXIMATE AND SUBJECT TO REFINEMENT DURING THE DESIGN PHASE.
2. UNDERLYING SEDIMENT MAY INCLUDE BAY MUD AND/OR SAND.
3. IN AREAS WHERE TPAH-25 IS GREATER THAN THE 100,000ug/kg SCREENING THRESHOLD IN THE SHALLOW UNDERLYING SEDIMENT, A CHEMICAL ISOLATION LAYER IS INCORPORATED IN THE PRELIMINARY CAP DESIGN. WHERE TPAH-25 IS LESS THAN THE SCREENING THRESHOLD, THE CHEMICAL ISOLATION LAYER MAY NOT BE INCLUDED.
4. PERCENTAGE OF REACTIVE COMPONENT IN CHEMICAL ISOLATION LAYER MAY VARY.
5. THE TYPE OF PHYSICAL ISOLATION AND EROSION PROTECTION WILL BE DEPENDENT UPON THE AMOUNT OF SCOUR EXPECTED IN THE AREA. MILD AND HEAVY EROSION PROTECTION MAY ALSO SERVE AS A MARKER LAYER.
6. SCENARIO 1 INDICATES ORIGINAL MUDLINE IS ABOVE THE DREDGED SURFACE ELEVATION PRIOR TO CAP PLACEMENT. SCENARIO 2 INDICATES ORIGINAL MUDLINE IS APPROXIMATELY AT THE DREDGED SURFACE ELEVATION (E.G. SCOUR HOLES) AND DREDGING MAY NOT BE REQUIRED PRIOR TO CAP PLACEMENT.

Figure 4-1

Conceptual Design for Capping and Armoring

Source: *Haley & Aldrich 2021, Figure 20*

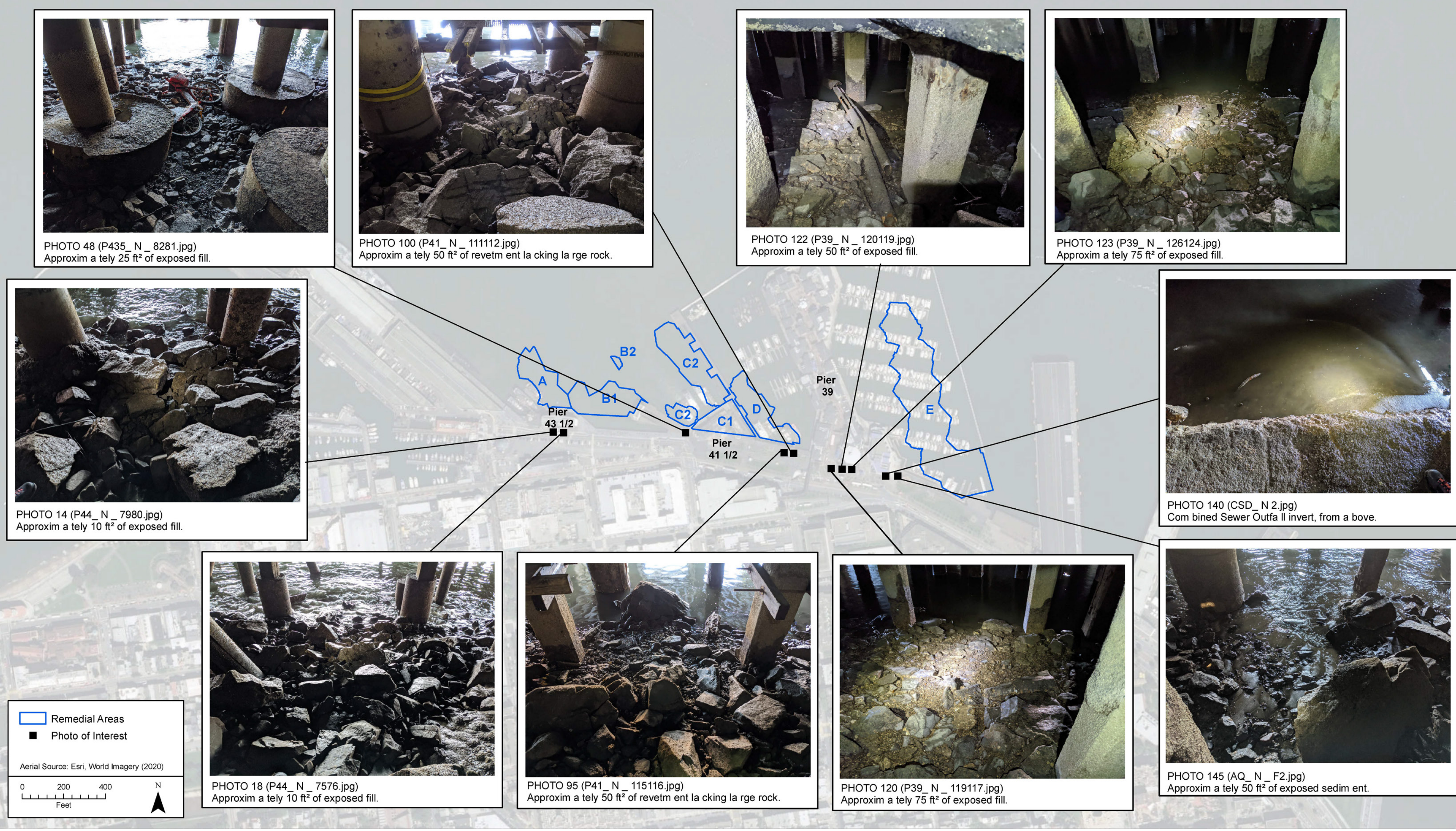
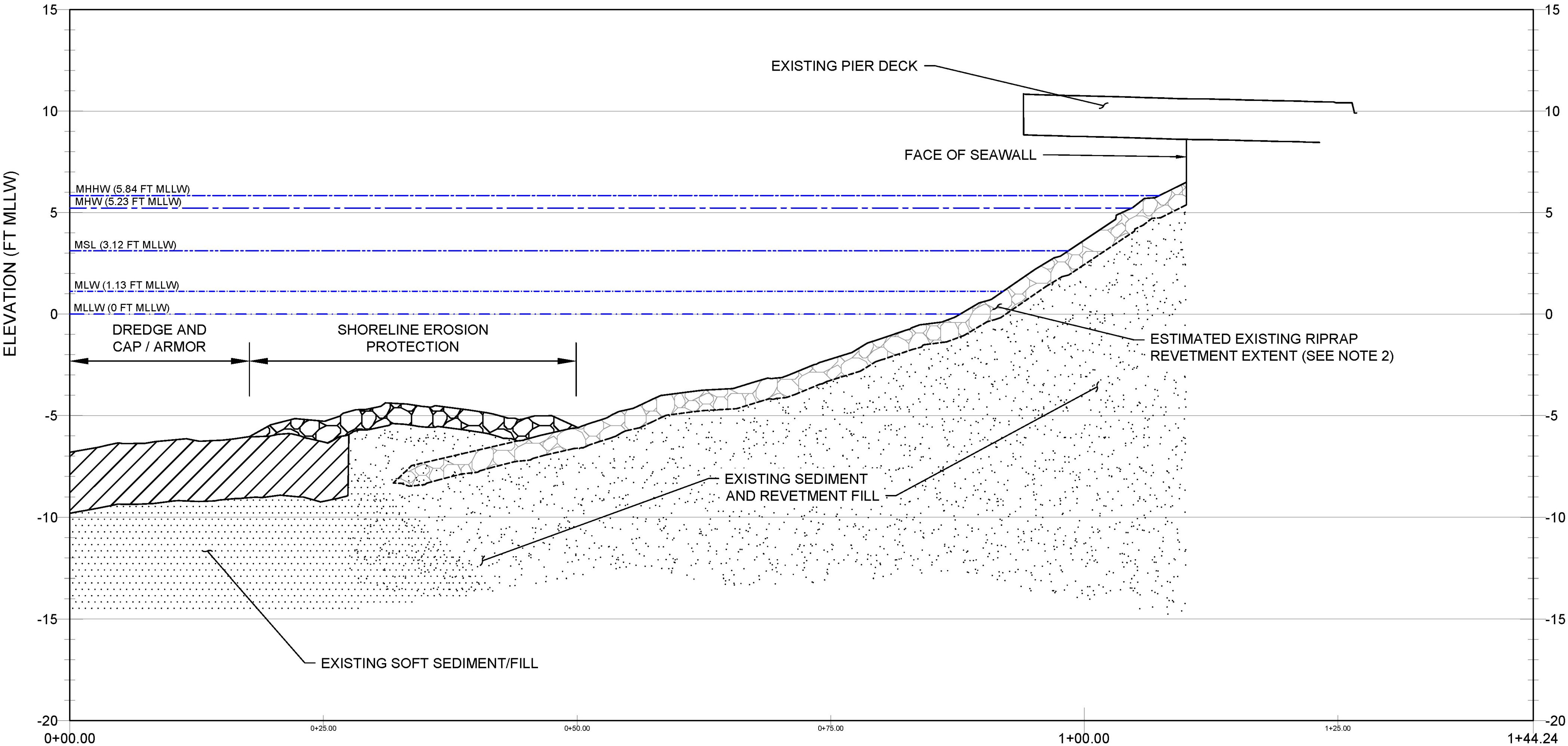


Figure 4-2

Shoreline Riprap Assessment

Source: *Provided by Haley & Aldrich*



LEGEND

- DREDGE AND CAP EXTENT (SEE NOTE 4)
- TRANSITION ZONE RIPRAP
- ESTIMATED RIPRAP REVETMENT EXTENT
- EXISTING SEDIMENT AND REVETMENT FILL
- EXISTING SOFT SEDIMENT/FILL
- MEAN HIGHER-HIGH WATER ELEVATION (MHHW)
- MEAN HIGH WATER ELEVAITON (MHW)
- MEAN SEA LEVEL ELEVATION (MSL)
- MEAN LOW WATER ELEVATION (MLW)
- MEAN LOWER LOW ELEVATION (MLLW)

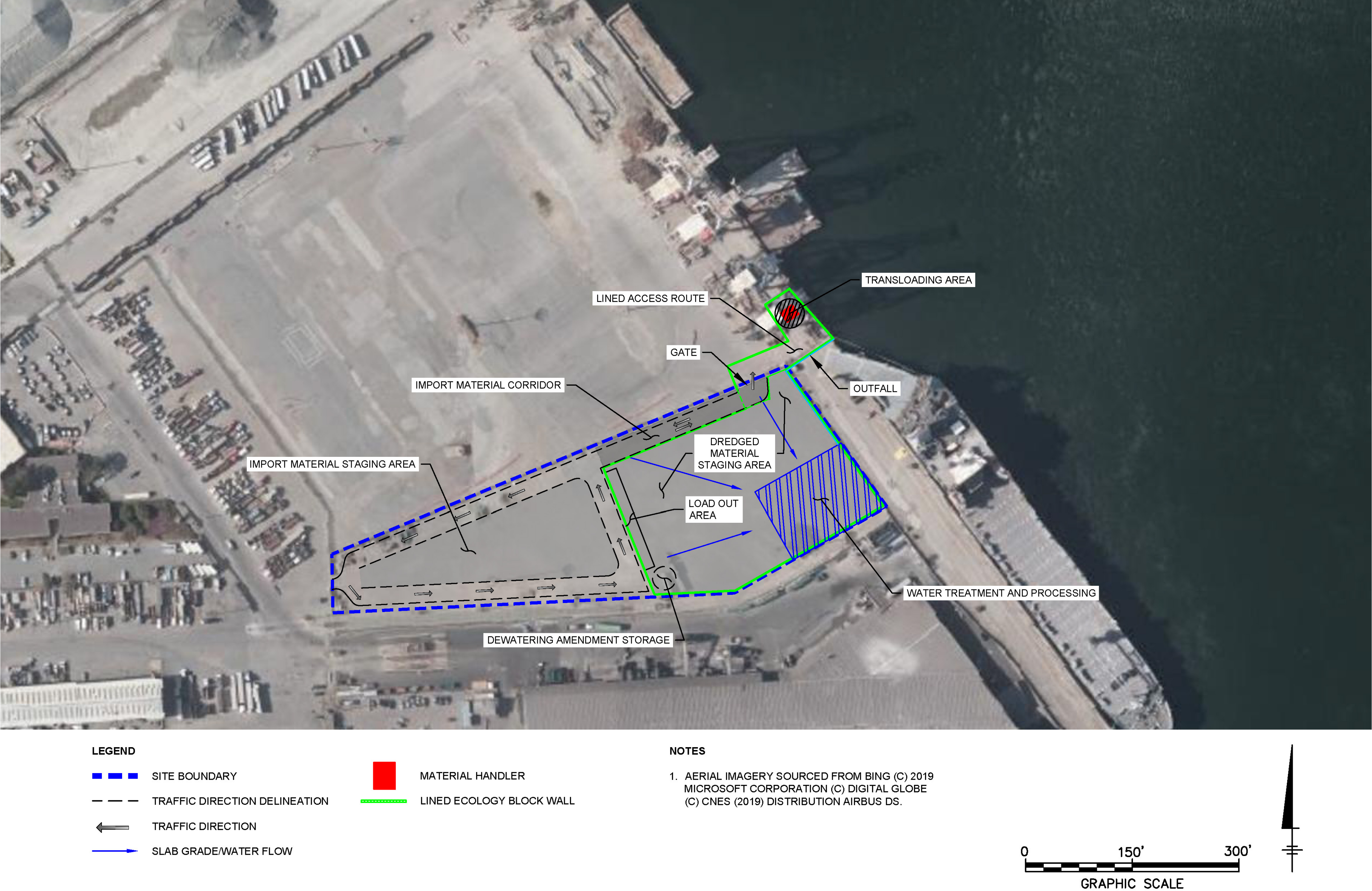
NOTES

1. BATHYMETRIC AND TOPOGRAPHIC SURVEYS WERE CONDUCTED BY DIXON MARINE SERVICES, ETRAC, AND TOWILL, JANUARY 2019-APRIL 2019. VERTICAL DATUM IS IN REFERENCE TO MLLW BASED ON SAN FRANCISCO TIDE STATION 9414290. HORIZONTAL DATUM IS IN REFERENCE TO NAD83 CALIFORNIA STATE PLANE ZONE 3.
2. EXTENT AND THICKNESS OF EXISTING RIPRAP REVETMENT VARIES BY AREA ALONG THE SEAWALL.
3. CROSS SECTION FOR VISUALIZATION PURPOSES ONLY, NOT FOR DESIGN OR CONSTRUCTION.
4. ALL WORK PRESENTED IN THIS FIGURE IS CONSIDERED PRELIMINARY AND SUBJECT TO REFINEMENT DURING THE DESIGN PROCESS.
5. TIDE DATUM INFORMATION GATHERED FROM NOAA TIDE STATION 9414290, SAN FRANCISCO.

Figure 4-3

Conceptual Cross Section for Shoreline Erosion Protection

Source: *Haley & Aldrich 2021, Figure 13*



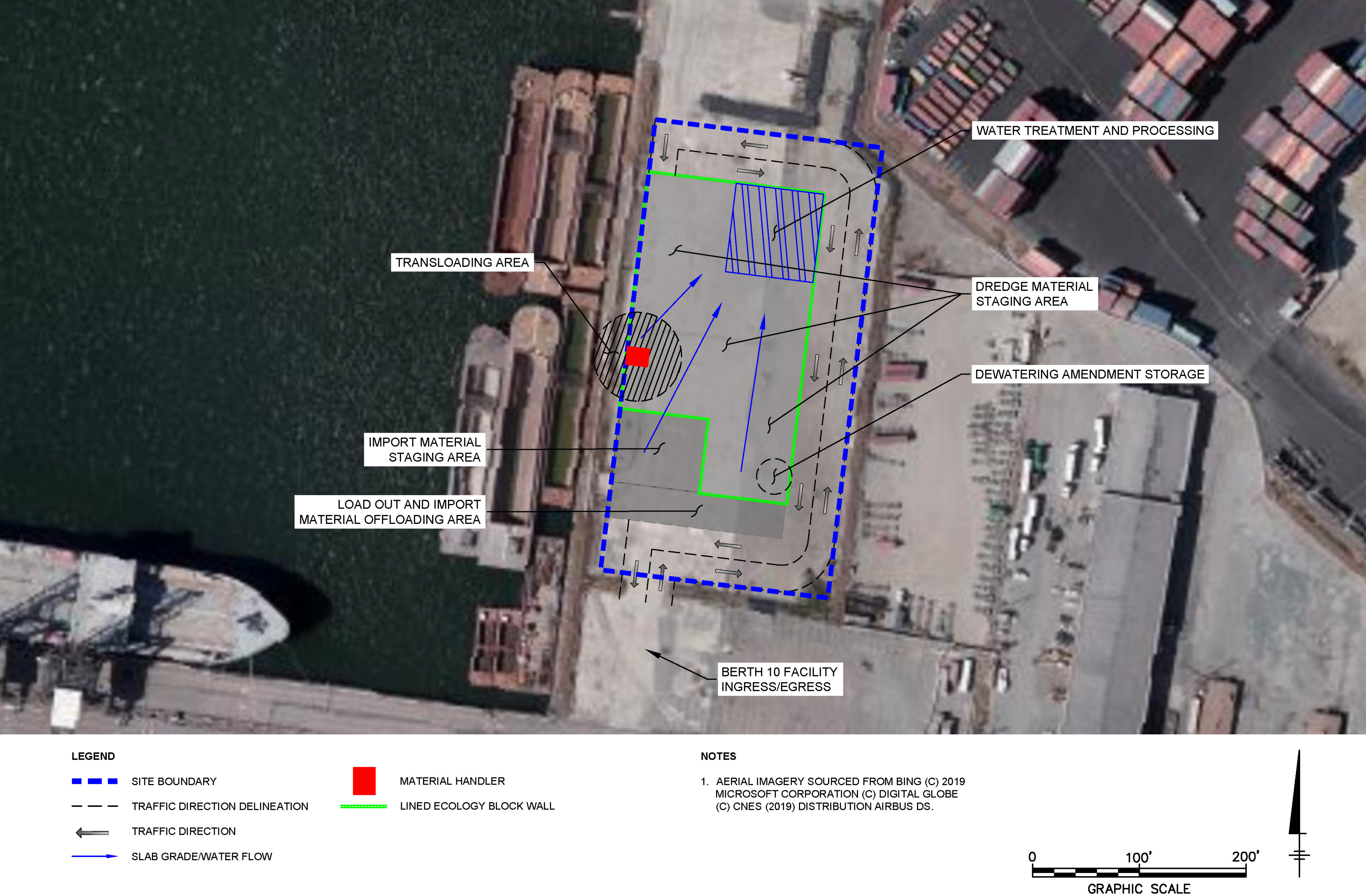
NOTES

1. AERIAL IMAGERY SOURCED FROM BING (C) 2019 MICROSOFT CORPORATION (C) DIGITAL GLOBE (C) CNES (2019) DISTRIBUTION AIRBUS DS.

Figure 4-4

Conceptual Layout of Material Handling Facility at Pier 96

Source: *Haley & Aldrich 2021, Figure 16*



NOTES

1. AERIAL IMAGERY SOURCED FROM BING (C) 2019 MICROSOFT CORPORATION (C) DIGITAL GLOBE (C) CNES (2019) DISTRIBUTION AIRBUS DS.

Figure 4-5

Berth 10 Material Handling Facility Area

Source: *Haley & Aldrich 2021, Figure 17*

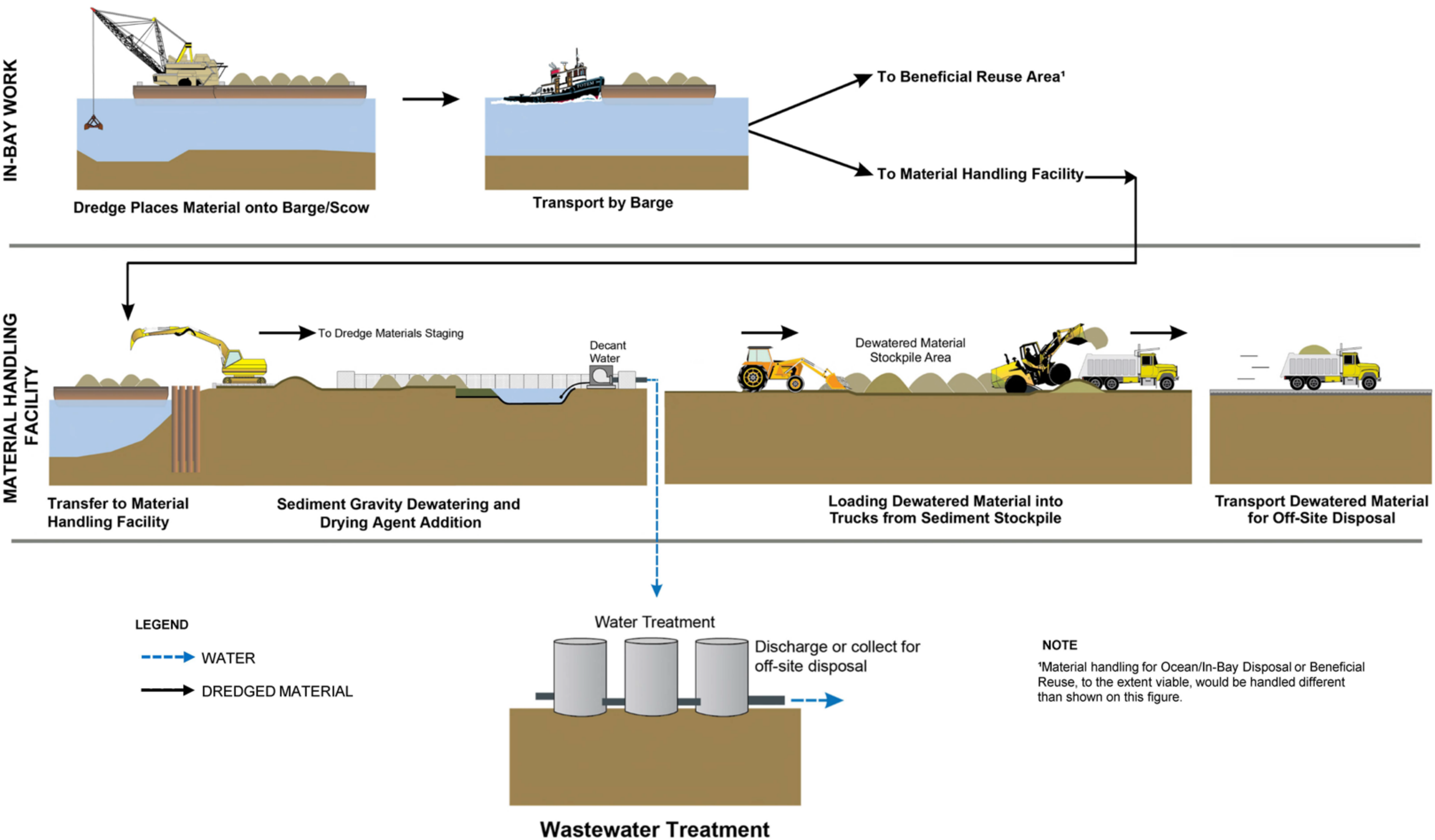


Figure 4-6

Dredged Material Removal, Handling, and Transport Process

Source: *Haley & Aldrich 2021, Figure 15*

LEGEND

SITE LOCATION NAME

- PIER 96
- ALTAMONT LANDFILL AND RESOURCE RECOVERY FACILITY
- CLEAN HARBORS BUTTONWILLOW LANDFILL FACILITY
- KELLER CANYON LANDFILL
- KETTLEMAN HILLS FACILITY
- POTRERO HILLS LANDFILL
- VASCO ROAD LANDFILL

TRAVEL ROUTE

- NON-HAZARDOUS LANDFILLS
- HAZARDOUS LANDFILLS

NOTES

1. ROUTES ARE SUBJECT TO CHANGE DURING THE REMEDIAL DESIGN. THEY CURRENTLY REPRESENT SHORTEST DRIVING DISTANCE.

2. ROUTES AVOID THE RESTRICTIONS ON ROUTE 580 FROM FOOTHILL BLVD IN SAN LEANDRO TO GRAND AVE. IN OAKLAND.

3. TOPOGRAPHIC BASEMAP SOURCE: ESRI

4. AERIAL IMAGERY SOURCE: ESRI

0 0.5 1
INSET MAP SCALE IN MILES

0 30 60
MAIN MAP SCALE IN MILES

Figure 4-7

Truck Routes and Landfill Locations (Pier 96 Option)

Source: *Haley & Aldrich 2021, Figure 18*

LEGEND

SITE LOCATION

- BERTH 10
- ALTAMONT LANDFILL AND RESOURCE RECOVERY FACILITY
- CLEAN HARBORS BUTTONWILLOW LANDFILL FACILITY
- KELLER CANYON LANDFILL
- KETTLEMAN HILLS FACILITY
- POTRERO HILLS LANDFILL
- VASCO ROAD LANDFILL

TRAVEL ROUTE

- NON-HAZARDOUS LANDFILLS
- HAZARDOUS LANDFILLS

NOTES

1. ROUTES ARE SUBJECT TO CHANGE DURING THE REMEDIAL DESIGN. THEY CURRENTLY REPRESENT SHORTEST DRIVING DISTANCE
2. TOPOGRAPHIC BASEMAP SOURCE: ESRI
3. AERIAL IMAGERY SOURCE: ESRI

0 0.5 1
INSET MAP SCALE IN MILES

0 30 60
MAIN MAP SCALE IN MILES

Figure 4-8

Truck Routes and Landfill Locations (Berth 10 Option)

Source: *Haley & Aldrich 2021, Figure 19*

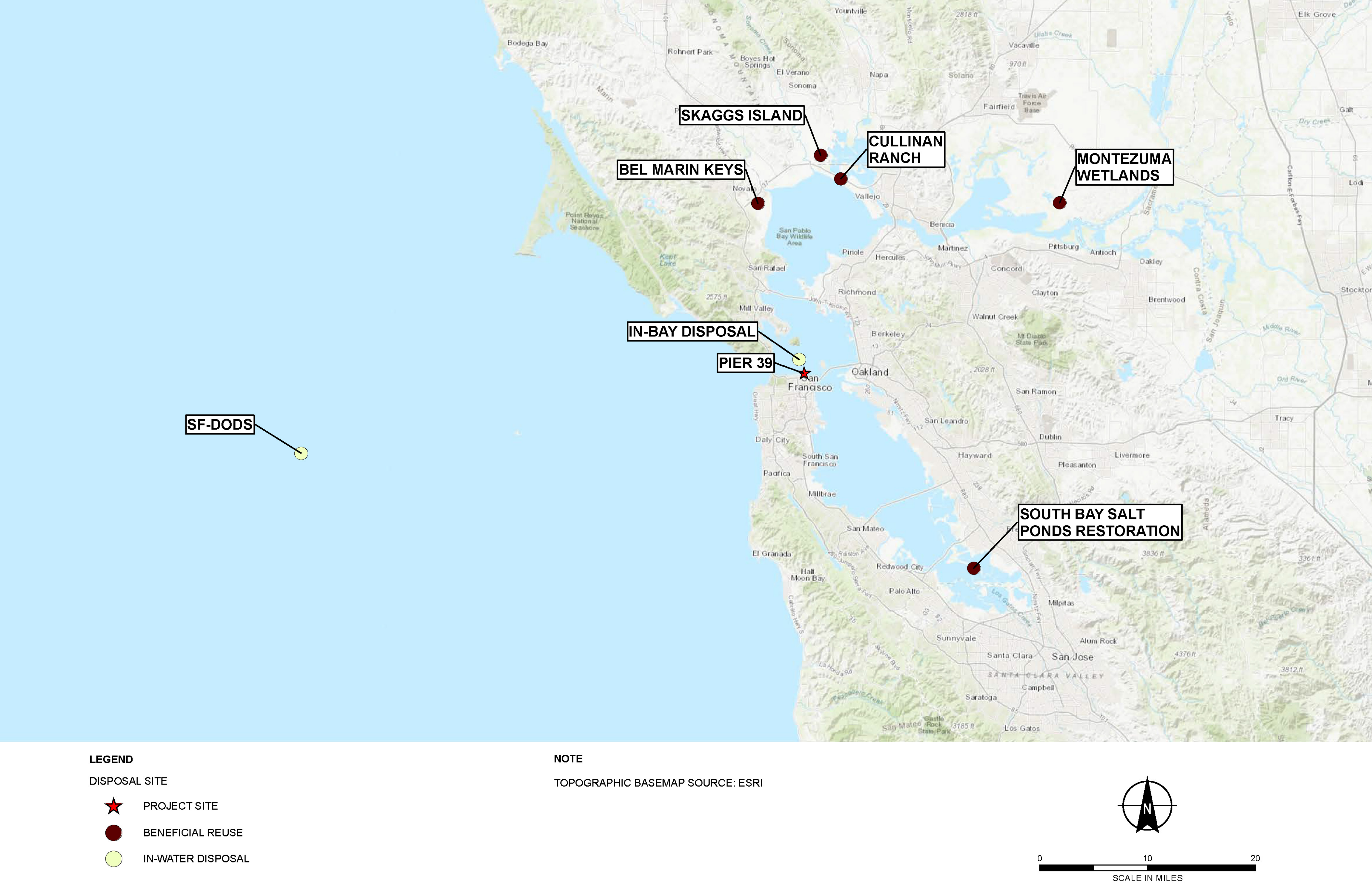


Figure 4-9

Alternate Disposal Locations

Source: *Haley & Aldrich 2021, Figure 14*

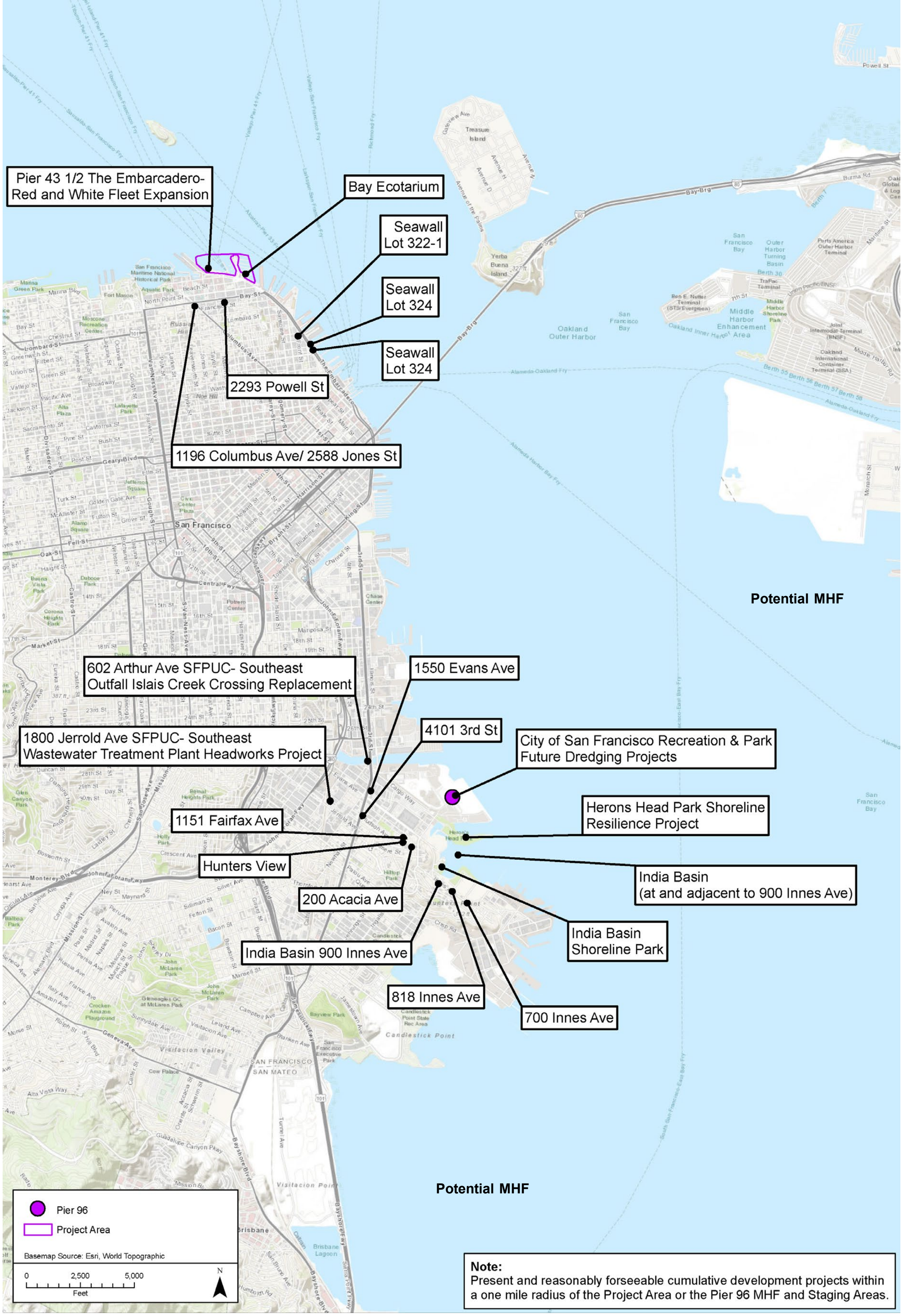


Figure 5-20.1

Projects in the Vicinity of Pier 39 to 43 ½ and Pier 96

Attachment A

Plans, Controls, and Avoidance and Minimization Measures

ATTACHMENT A
PLANS, CONTROLS, AND AVOIDANCE AND MINIMIZATION MEASURES

During construction, a compliance monitoring program will be implemented to guide and monitor the implementation of construction controls and to document conformance with the details provided in the plans and specifications of the remedial design as well as regulatory and permit requirements. The monitoring program will also include demonstrating compliance with California Environmental Quality Act (CEQA) mitigation measures. Numerous temporary control measures, also known as avoidance and minimization measures (AMMs), will be implemented to mitigate the temporary impact of construction on the surrounding community and environment. These will include general best management practices (BMPs) for pollution prevention and construction management. The plans and controls/AMMs detailed herein would be subject to modifications and additions based upon regulatory and resource agency review.

Compliance, Monitoring, and Management Plans

Several compliance, monitoring, and management plans will be developed, incorporated into the Project Contract Documents (as applicable), and implemented to address environmental and public health and safety issues. Table A1 summarizes these plans.

Table A1. Summary of Plans To Be Incorporated into Project Contract Documents

Plan	Purpose	Anticipated Content	Agency Submittal and Review Required
Environmental Compliance Plans			
Environmental Compliance Management Plan	Provides monitoring and/or inspecting and reporting requirements for compliance measures.	• Checklist of applicable environmental rules and regulations of federal, state, and local agencies • Checklist specifying monitoring/inspection and reporting requirements needed to comply with the identified control and AMMs as well as the CEQA measures outlined in the Mitigation and Monitoring Plan • Checklist of measures needed to comply with monitoring/inspection and reporting requirements based on regulatory agency requirements resulting from the permitting of the Project • Checklists of Pacific Gas and Electric Company (PG&E) requirements and procedures specifying monitoring/inspection and reporting procedures • Project roles and responsibilities related to environmental compliance • Project modification guidelines	None
Health and Safety Plan	Provides site-specific measures to protect the public, workers, visitors, and the environment while implementing construction activities (meets Occupational Safety and Health Administration requirements).	• Known and potential physical and chemical hazards anticipated for the proposed field activities • Directions for preparing Job Hazard Analyses for field tasks • Personal protective equipment requirements for field activities • Emergency response procedures, including routes to nearest medical facilities • Safety data sheets or equivalent chemical hazard information for chemicals of concern • Decontamination procedures • Dust and vapor monitoring and action levels for worker protection (air monitoring and sampling plan to address conditions in the work zone)	Port of San Francisco (Port) (with building/encroachment permits)

Table A1. Summary of Plans To Be Incorporated into Project Contract Documents

Plan	Purpose	Anticipated Content	Agency Submittal and Review Required
Dust, Vapor, and Odor Control Plan	Describes how to control emissions during construction activities such as handling and managing imported materials, transportation, processing, dewatering, and loading out dredged materials from the material handling facility (MHF) to the disposal facility. Contains measures that are consistent with the Bay Area Air Quality Management District (BAAQMD) basic construction recommendations and meet requirements of the Port and the City and County of San Francisco.	• Field monitoring and compliance thresholds for dust and vapor for community protection (to be used in the Ambient Perimeter Air Monitoring Plan) • Water application guidelines and plan (such as misting around dry work and spraying stockpiles) • Construction vehicle speed limits • Track-out controls (such as street sweeping and wheel washing stations) • Stop work limits on windy days • Sediment stockpile management directions (such as encrustation and covering) • Odor suppression and control measures to eliminate or minimize odors that may be temporarily apparent during dredging and capping elements of the remediation activities	San Francisco Bay Regional Water Quality Control Board (Regional Water Board) and Port (with building/encroachment permits)
Ambient Perimeter Air Monitoring Plan	Addresses air quality at the perimeter of the work zone to protect nearby receptors. Describes perimeter air monitoring and responses if action levels are exceeded.	• Identification of chemicals of potential concern and action levels • Description of methods to monitor concentrations of chemicals of potential concern in perimeter air • Appropriate response actions and requirements for air monitoring and reporting results	Regional Water Board and Port (with building/encroachment permits)
Surface Water Quality Monitoring Plan	Describes the procedures and practices to be implemented during dredging and capping and other in-bay activities to protect Bay water quality.	• Descriptions of temporary enclosures, including turbidity curtains, used to maintain water quality • Description of water quality monitoring during removal of contaminated sediments and placement of capping materials for the Project, including water quality compliance criteria, monitoring methods, frequency, and reporting requirements • A description of water quality monitoring to verify effectiveness of temporary enclosures at limiting the spread of visible pollutants (including turbidity and sheen) beyond the construction zone	Regional Water Board

Table A1. Summary of Plans To Be Incorporated into Project Contract Documents

Plan	Purpose	Anticipated Content	Agency Submittal and Review Required
		• Plan for visual monitoring within enclosures, such as silt curtains and absorbent booms used for the work in water	
Stormwater Pollution Prevention Plan/ Water Pollution Control Plan or Erosion and Sediment Control Plan[1]	Describes methods for addressing potential site-related stormwater runoff from the upland MHF and staging areas and the use of water during construction. Prepared in collaboration with the PG&E Storm Water Group.	• Plan for monitoring runoff when water is used for dust control on stockpiles (e.g., of import capping materials and amendments) • Plan for monitoring erosion and sediment migration from stockpiles • Plan for water discharges, if any • Chemical and fuel storage plans (secondary containment and other measures) • Spill control plan, which will address hazardous material spills on the upland staging areas • Specific practices that may be implemented to reduce the sediment load of stormwater runoff from the MHF, including stormwater control devices (earth berms, silt fences/curtains, or other barriers) installed along the perimeter of stockpile areas and protecting existing catch basins with silt fences or gravel bags	Regional Water Board and Port (with building/encroachment permits)
Sound Attenuation and Monitoring Plan	Provides guidelines for assessing and mitigating airborne and in-water noise produced while implementing the recommended remedial alternative to	• Vibration limits for construction activities • Methods to reduce vibrations where possible (anticipated when removing and replacing piles) • Noise mitigation plan as required by the City and County of San Francisco and Port permits	National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) and

[1] A Stormwater Pollution Prevention Plan is required to comply with the State Water Resources Control Board's National Pollutant Discharge Elimination System General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities only if a project will disturb more than 1 acre of land. If a Stormwater Pollution Prevention Plan is not required, the required information will be detailed in an Erosion and Sediment Control Plan in accordance with the City and County of San Francisco's Construction Site Runoff Ordinance and Best Management Practices Handbook and BMP methods presented in the San Francisco Public Utilities Commission Construction BMP Handbook (August 2013) and the San Francisco Public Utilities Commission Construction Site Runoff Control Technical Standard and Guidelines, respectively.

Table A1. Summary of Plans To Be Incorporated into Project Contract Documents

Plan	Purpose	Anticipated Content	Agency Submittal and Review Required
	minimize effects on marine mammals and listed fish species.	• Anticipated hours of regulated sound in accordance with City and County of San Francisco and Port requirements • Sound monitoring and reporting plans • Anticipated receptors	California Department of Fish and Wildlife (CDFW)
Marine Mammal Monitoring Plan	Provides methods for monitoring and reporting that will account for the level of taking or impacts on populations of marine mammals that are expected to be present while identified Project elements are in progress. Also provides reporting requirements to ensure take beyond that authorized does not occur.	• Observation guidelines for spotting marine mammals in the defined area of potential sound effects • Hydroacoustic monitoring limits, based on the conservation measures approved through the Incidental Harassment Authorization or Letter of Authorization issued by NOAA NMFS • Acoustic threshold zones • Protocols for minimizing marine mammal harassment, including stop work provisions	NOAA NMFS
Marine Invasive Species Control Plan	Provides methods to contain the spread of non-native species to Bay waters.	• Methods to prevent the release and spread of marine invasive species • Procedures for the safe removal and disposal of any invasive taxa observed on the removed structures prior to disposal or reuse of pilings or marina infrastructure • Appropriate procedures for equipment or infrastructure decontamination	None
Waste Management and Transportation Plan	Provides specific approaches for managing materials in a way that reduces impacts on human health and the environment and minimizes impacts on local traffic, business, and residents near the MHF and along designated haul routes.	• Sampling and analysis protocols (including waste profiling) for sediment and water • Methods to safely and efficiently manage offsite disposal of sediment and other waste material (such as debris, as specified in a waste diversion plan) generated while implementing the recommended remedial alternative • Export and import tracking procedures and manifesting of loads	Regional Water Board and Port (with building/encroachment permits)

Table A1. Summary of Plans To Be Incorporated into Project Contract Documents

Plan	Purpose	Anticipated Content	Agency Submittal and Review Required
		• Transportation routes within site limits, between the site and MHF, and to disposal destinations • Descriptions of proposed staging areas • Onsite signage requirements (including for haul routes, waste loading, and waste storage) • Procedures for loading and managing trucks • Transportation/disposal documentation management • Estimated daily quantity and schedule for trucks and loads per truck • Truck inspection and documentation requirements • Anticipated work hours on the site • Emergency procedures related to transportation	
Sediment Processing and Construction Water Management Plan	Describes specific approaches for processing sediment decant water and other construction water that may be generated while implementing the recommended remedial alternative as well as identifying water supply sources and associated use.	• Sediment treatment and dewatering plan (gravity dewatering and the addition of cement or other reagents are assumed to be the method by which dredged sediments are dried) • Decant water collection, testing, treatment, and discharge/disposal plans • Decant or process water discharge limits in accordance with appropriate permits (National Pollutant Discharge Elimination System General Permit and/or San Francisco Public Utilities Commission Wastewater Discharge Permit) • Storage plan for decant as well as potable water required for work, including descriptions of storage/fractionation tanks, as needed, and containment methods • Plans for equipment decontamination rinse water (estimated to be containerized and either treated at the MHF or disposed of offsite).	Regional Water Board and Port (with building/encroachment permits)

Table A1. Summary of Plans To Be Incorporated into Project Contract Documents

Plan	Purpose	Anticipated Content	Agency Submittal and Review Required
Sustainability Measures Implementation Plan	Identifies sustainable practices for remedy implementation.	• Strategies to optimize sustainability such as opportunities for reducing electricity and water consumption, volumes of material purchased, offsite disposal volumes, and selecting equipment of sustainable size • Recommendations for sustainability BMPs • Sustainability impact evaluation • An activity-specific sustainability rating • Recommendations for additional sustainable practices and data management and reporting related to sustainable practices Note: This plan will follow PG&E's July 2012 (revision 1) Programmatic Sustainable Remediation Guidance.	None
Construction Compliance Plans			
Construction Quality Assurance/Control Plan	Identifies the responsibilities of the engineer and the remediation contractor(s) for documenting, testing, and inspecting the work while implementing the recommended remedial alternative.	• Construction submittal requirements • Construction monitoring and observation requirements • Imported capping material submittals and testing requirements • Site preparation guidelines • Quality assurance/quality control procedures associated with work (including dredging, cap placement, and restoration) • Post-work survey requirements (such as survey tolerances and grid/interval requirements) • Documentation procedures	None

Table A1. Summary of Plans To Be Incorporated into Project Contract Documents

Plan	Purpose	Anticipated Content	Agency Submittal and Review Required
Dredging and Capping Operations Plan[2]	Provides the approach and sequencing for dredging and capping activities to reduce impacts on human health and the environment while achieving Project objectives; to be prepared with input from the selected contractor.	• Dredging methods • Equipment inspection and documentation requirements • Temporary aids to navigation plan to delineate exclusion zones and communicate restrictions to vessel operation near the work areas (e.g., no wake zones, restricted areas) • Capping material specifications and placement methods • Dredging and capping sequence	Aids to navigation plan will require U.S. Coast Guard approval
Geotechnical Instrumentation and Monitoring Plan	Monitor vibrations and potential movement at key buildings and other structures (e.g., nearby the building on Pier 43½ and the Ferry Arch). Install vibration monitors to continuously record ground vibrations. Establish survey reference points to document potential horizontal and vertical movements of structures and improvements. Install crack gauges over existing cracks on nearby concrete structures and improvements.	• Vibration and potential movement limits associated with construction activities • Methods to reduce vibrations where possible (anticipated when removing and replacing piles) • Survey reference points plan, with monitoring points on the Ferry Arch, seawall, wharf, and select Pier 43½ buildings • Crack gauges over existing cracks on concrete and masonry improvements, including seawall and Ferry Arch • Monitoring and reporting plans for vibration, movement, and crack monitoring • Mitigation plan for addressing vibration or movements exceeding action limits	Port

[2] For any disposal to the San Francisco Deep Ocean Disposal Site or a beneficial reuse site, the Dredged Material Management Office will review the Dredge Operations Plan component. In that case, a separate deliverable will be provided that covers dredging work and placement at the disposal site only (would not describe capping).

Post-Remediation Plan			
Post-Construction Risk Management and Monitoring Plan	Provides summary of remediation activities and monitoring plans.	• Post-construction monitoring and potential restoration activities • Institutional controls • Long-term monitoring, adaptive management activities to maintain cap elements, evaluation of reapplication of *in situ* treatment media, and requirements for conducting intrusive activities, which may require cap restoration • Long-term monitoring of cap integrity and thickness in response to physical processes, such as erosion due to high flows, flooding, and anthropogenic activities	Regional Water Board and Port

Controls and Avoidance and Minimization Measures

Control measures and AMMs are procedures known to reduce the potential for impacts based on regulatory agency requirements, standards in the industry, and construction and operating experiences of the contractor and the design engineer.

Construction Controls and Monitoring

During construction, temporary controls will be implemented to mitigate temporary construction impacts on the environment and surrounding community, as outlined in the plans described above, including engineering controls and/or operational BMPs. A construction oversight program will be implemented to guide and monitor the implementation of construction controls. The oversight program would include elements such as biological surveys, where required, and monitoring of potential environmental impacts, including water quality/turbidity monitoring during in-water activities, air monitoring (as applicable), noise monitoring, and a qualitative evaluation of odor.

Control Measures and AMMs

Material Handling Facility

1. Rubbish and debris will be removed from job site daily with proper disposal in compliance with all federal, state, and local regulations. Removal and transport of rubbish and debris will be in a manner that prevents spillage on pavements, streets, and adjacent areas. Any spillage will be cleaned up.
2. Materials that cannot be removed daily will be stored in the contractor's approved laydown and storage areas, following all requirements established by the property owner and associated permitting jurisdiction.
3. Temporary lighting will be provided that complies with California Occupational Safety and Health Administration (Cal/OSHA) standards.
4. Operations will be conducted in a manner that causes as little damage to hardscape and landscape areas as possible:
   - The contractor will protect all existing utilities, pavement, sidewalks, curbs, fences, landscaping, and other improvements that are not designated for removal, from damage by his operations. Any such features that are damaged or temporarily relocated by the contractor during construction will be repaired or restored by the contractor to a condition equal to or better than they were prior to such damage or temporary relocation.
   - Pavement will be restored in all roadways, driveways, and sidewalks, as deemed necessary by the landowner.

5. Upon completion of the work, and prior to final acceptance, the contractor will remove from the vicinity of the work all surplus material and equipment belonging to them or used under their direction during construction. Some materials may be stored between phases or construction years.
6. If stockpiling of material is necessary, stockpiles will be stored within a bermed area on liner material, protected from stormwater run-on/runoff, and covered to prevent windblown dust. Any accumulated water would be collected from a low point within the bermed area and pumped into a portable storage tank. The contained water would be tested and treated, if necessary, before disposal and/or discharged in accordance with the Stormwater Pollution Prevention Plan/Water Pollution Control Plan or the Erosion and Sediment Control Plan; alternatively, the water could be discharged with the decant water, in accordance with the National Pollutant Discharge Elimination or San Francisco Public Utilities Commission permit requirements.
7. Dumpsters or other closable containers will be used to contain solid waste.

Construction/Remediation

1. Upland work can take place year-round. Other activities, such as material acquisition and contractor document submittals, may occur prior to mobilization. However, in-water work is generally restricted to "work windows" for San Francisco Bay, which run from June 1 through November 30 each year to protect sensitive species.[3] Some in-water construction activities may be approved (during the permitting process) to take place outside these in-water work windows and as long as the work complies with the biological mitigation measures and any permit requirements. These activities may include, but not be limited to:
   - Installing protection for structures, establishing staging areas, and deploying navigation aids
   - Removing, relocating, or replacing docks and other infrastructure
   - Removing piles and installing piles to support turbidity control features as well as pile replacement[4]
   - Placing backfill, riprap, and/or armor in some areas

[3] https://www.spn.usace.army.mil/Missions/Dredging-Work-Permits/LTMS/

[4] Vibratory methods may be utilized outside the herring spawning season (between December 1 and March 15). Year-round work assumes CDFW is able to issue a herring waiver and herring spawning is not observed. See additional restrictions and requirements listed in the Biological Resources and Noise sections.

All impact hammer pile driving would need to be conducted within the work windows. See additional restrictions and requirements listed in the Biological Resources and Noise sections.

2. No debris, rubbish, creosote-treated wood, soil, silt, sand, cement, concrete, or washings thereof, or other construction-related materials or wastes, oil, or petroleum products will be allowed to enter into or placed where it would be subject to erosion by rain, wind, or waves and enter into jurisdictional waters.
3. Protective measures will be used to prevent accidental discharges to waters during fueling, cleaning, and maintenance.
4. Floating booms will be used to contain debris discharged into waters and any debris will be removed as soon as possible, and no later than the end of each workday.
5. Machinery or construction materials not essential for Project improvements will not be allowed at any time in the intertidal zone. The construction contractors will be responsible for checking daily tide and current reports.
6. The contractor will have a spill contingency plan for hazardous waste spills into San Francisco Bay. The plan will include floating booms and absorbent materials to recover hazardous wastes. Non-buoyant debris discharged into waters will be recovered (by divers) as soon as possible after discharge.

Air Quality

The plans listed in Table A1 will ensure that field activities are conducted in a manner that is protective of workers, other site personnel, and the public in the immediate surrounding area. Specifically, the Health and Safety Plan will include an Air Monitoring and Sampling Plan to monitor and document conditions in the work zone, whereas the Ambient Perimeter Air Monitoring Plan addresses the air quality at the perimeter of the work zone to protect nearby receptors. Implementing the Health and Safety Plan and Ambient Perimeter Air Monitoring Plan will document that field activities have been conducted in a manner protective of workers, other site personnel, and the public. The Dust, Vapor, and Odor Control Plan will include field monitoring and compliance thresholds for dust and vapor for community protection, which will also be used in the Ambient Perimeter Air Monitoring Plan. These plans will work in conjunction with one another along with the dust, vapor, and odor control measures listed below.

Dust, Vapor,[5] and Odor Control

The Dust, Vapor, and Odor Control Plan will be consistent with Bay Area Air Quality Management District (BAAQMD) construction recommendations for all proposed projects and would include the following:

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[5] Vapors are not expected to be a significant issue with sediment remediation. BAAQMD recommends BMPs to manage vapors, which primarily include wetting and covering of stockpiles. Given that dredged sediments are wet, these BMPs are already inherent in the management of sediments. The Project is expected to be exempt from permitting for volatiles emissions, but there could be a notification requirement.

1. All exposed unpaved surfaces that significantly create dust (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) will be watered up to two times per day, as necessary.
2. All haul trucks transporting soil, sand, or other loose material offsite will be covered.
3. All visible mud or dirt track-out from adjacent public roads will be removed using wet power vacuum street sweepers, as needed. The use of dry power sweeping is prohibited.
4. Construction vehicle speed limits will be set to reduce dust generation; all vehicle speeds on unpaved roads on the site will be limited to 15 miles per hour to minimize visible dust generation.
5. All roadways, driveways, and sidewalks to be paved will be completed as soon as possible. Building pads will be laid as soon as possible after grading unless seeding or soil binders are used.
6. Idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California Airborne Toxic Control Measure Title 13, Section 2485 of the California Code of Regulations). Clear anti-idling signage will be provided for construction workers at all access points.
7. Construction equipment will be maintained and properly tuned in accordance with manufacturer's specifications. All equipment will be checked by a certified mechanic and determined to be running in proper condition prior to operation.
8. Publicly visible signage will be posted with the telephone number and person to contact regarding dust complaints. This person will respond and take corrective action within 48 hours.
9. All paved access roads, parking areas, and staging areas will be swept daily with water sweepers, as necessary.
10. Adjacent streets will be swept of debris generated from the site work activities, as necessary.
11. Observance of visible dust will result in an increase in water application. Nontoxic surfactants will be added, as necessary.
12. Drop heights of materials will be minimized. Dust-proof chutes will be used to load debris into trucks if applicable.
13. Pavements will be swept as often as necessary to avoid the spread of debris.
14. Wet suppression methods (such as misting around work areas and spraying stockpile and debris piles) will be applied, as needed, where the materials are dry and produce dust.

15. Track-out controls will be in place for construction vehicles (such as street sweeping, tire washing, and truck decontamination stations).
16. Preventative measures such as covering or wetting stockpiles of debris or other materials to control windblown dust will be implemented on high wind days (generally exceeding 25 miles per hour).
17. Debris piles and stockpiles will be covered, as will all haul trucks transporting soil, sediment, sand, or other loose material offsite.
18. Dust emissions will be controlled to reduce potential impacts on workers, the surrounding community, and the environment. These emissions may be mitigated using engineering controls (e.g., water for dust suppression).
19. Odors will be controlled to eliminate or minimize odors that may be temporarily apparent during dredging capping, and material handling elements of the remediation activities. These measures will likely include a water-based, biodegradable odor suppressant (e.g., Rusmar®, Biosolve®, or equivalent), as necessary. Suppressant material, if used, will not be added directly into the Bay but could be applied to material on the barge or at the MHF. Other measures, such as but not limited to applying water over the top of odor-generating material as an odor cap, may also be used for odor control.
20. Priority will be given to obtaining power from PG&E to reduce air pollutant emissions; if not practicable, then electrical generators and, if necessary, diesel generators will be used, subject to the noise attenuation measures described under "Noise" below.

Hazardous Materials

1. All hazardous materials will be stored and handled in strict accordance with the Safety Data Sheets for the products. The storage and handling of potential pollution-causing and hazardous materials, including but not necessarily limited to gasoline, oil, and paint, will be in accordance with all local, state, and federal requirements.
2. The contractor will provide copies of hazardous waste transporter licenses, permits, or registrations for all states in which the shipment will travel.
3. The contractor will obtain all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the work, including certification of transport vehicles carrying hazardous material.

Safety

1. The contractor will prepare and submit for review a supplemental Health and Safety Plan. The supplemental Health and Safety Plan will be prepared by an industrial hygienist certified by the American Board of Industrial Hygiene.

2. Safety provisions will be employed conforming to the U.S. Department of Labor Occupational Safety and Health Administration, Cal/OSHA, and all other applicable federal, state, county, and local laws, ordinances, and codes.
3. An employee who is qualified and authorized to supervise and enforce compliance with the Safety Program will be appointed as safety supervisor. The Safety Program will include an operation plan with emergency contacts.
4. A written injury prevention program will be established, implemented, and maintained as required by Labor Code Section 6401.7.
5. In case of an emergency, all necessary repairs will be promptly executed when required by the construction manager.

Geotechnical

1. Recommendations derived from the geotechnical studies for design, construction, and long-term performance will be incorporated where appropriate into the Project Contract Documents.
2. A geotechnical, civil, or environmental engineer qualified in the applicable subject matter will:
   - Review the final Project plans and specifications prior to construction to verify that geotechnical aspects of the Project are consistent with the intent of the recommendations included in the geotechnical studies
   - Review geotechnical-related contractor submittals
   - Perform periodic site inspections during the construction to observe and document subsurface conditions encountered by the contractor with respect to the subsurface conditions described in the geotechnical studies report

Aesthetics

To reduce glare and light used during nighttime construction activities, the contractor will direct lighting onto the immediate area under construction only and avoid shining lights toward residences, nighttime commercial properties, and oncoming traffic lanes.

Noise

1. Dredging may be conducted during daylight hours, 7 days a week, including holidays. In addition, for any dredging work between the hours of 8:00 p.m. and 7:00 a.m., the contractor will obtain a San Francisco Night Noise Authorization Permit from the Port Building Permit Department, as specified in the City and County of San Francisco Noise Ordinance, Police Code Section 2908. The contractor is required to provide a minimum of 72 hours advance notice to residents and affected neighbors within ¼ mile of the Project Area for night noise authorization.

2. To reduce potential impacts from noise due to pile driving, the Project will implement one or more of the following as needed:
   – Use vibratory methods for installation of steel piles to the extent practicable
   – Use cushion blocks between hammer and piles
   – Implement a “soft start” technique
3. To reduce potential impacts from noise due to impact hammers, the Project will implement the following:
   – Operate a single impact hammer at a time
   – Implement a sound attenuation method using 36-inch steel or 20-inch concrete for the duration of use
4. Loud sound signals will be avoided in favor of light warnings except those required by safety laws for the protection of personnel.
5. Internal combustion engines will be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine will be operated without said muffler. In the absence of manufacturer’s recommendation, the Director of Public Works may prescribe a means of accomplishing maximum noise attenuation that is in the public interest.
6. To minimize noise levels, electrical power will be obtained from PG&E in lieu of a portable generator whenever possible. If use of utility power is not practicable, generator power may be provided by sound-attenuated and enclosed electric generators. Generators will not be used unless they are provided with sound enclosures, as necessary to comply with local ordinances.
7. If noise complaints are received, the source will be identified, and abatement will be evaluated and implemented where available.

Transportation

1. Sediment will be transported by trucks[6] that are watertight and sift-proof and meet U.S. Department of Transportation (USDOT) standards (as applicable). If necessary to prevent material from adhering to or spilling from truck beds, truck containers may be lined with 6-mil polyethylene, built-in liner, or coating, configured with sealed tailgate, or similarly protected. Trucks will be covered with a soft pull-tarp cover or similar for offsite transport. The tarp will extend over the side of the truck

[6] While Pier 96 has an existing rail spur, for purposes of the Initial Study/Mitigated Negative Declaration and the associated costing of waste management options, it has been assumed the material would be transported over the road in trucks. If rail access becomes available, additional considerations and requirements will apply to rail transport.

or rail container and will be secured in accordance with USDOT and California Highway Patrol standards.

2. The transportation contractor will be registered with the California Department of Toxic Substances Control and the California Environmental Protection Agency, as appropriate.

3. Vehicles used for waste transport will be properly maintained, registered, operated, and placarded in compliance with local, state, and federal requirements.

4. Vehicles used for waste transport will be equipped with dust covers and other required equipment to prevent releases of material.

5. Personnel transporting wastes offsite will be trained in accordance with 49 U.S. Code Section 1805(b) and 29 Code of Federal Regulations (CFR) 1910. If the waste material to be transported is hazardous, the transportation contractor will submit proof of valid hauler registration.

6. Haulers will follow all applicable requirements in 49 CFR Parts 174 through 177 with regard to loading, unloading, and general handling based on transport mode. Waste will be transported using USDOT-approved trucks or shipping containers in accordance with 49 CFR Parts 171 through 173, and 177 through 179, and other applicable local, state, and federal transportation guidelines.

7. The transportation contractor will equip the trucks with a basic spill kit and fire extinguishers, including up-to-date certifications, and will maintain 24-hour emergency response capability.

8. The transportation contractor will follow PG&E truck inspection and material transportation requirements (e.g., truck haul routes outlined in the Waste Management and Transportation Plan).

Cultural Resources

Construction crews will be trained in "basic archaeological/tribal resources identification" by a qualified archaeologist and tribal representative from the Federated Indians of Graton Rancheria and have access to a Cultural Resources Alert Sheet. The Alert Sheet will photographically depict midden and associated indicators of pre-contact archaeological sites (no photographs of human remains), and clearly outline the procedures in the event of an archaeological discovery. These procedures include temporary work stoppage (Stop Work Order) of all ground disturbance, short-term physical protection of artifacts and their context, and immediate advisement of the archaeological/tribal team and PG&E or their representatives.

Biological Resources

General Control Measures

1. All construction personnel (hereinafter referred to as personnel) will attend a mandatory environmental education program facilitated by the Project biologist prior to the initiation of construction activities. Training sessions will be repeated for all new personnel before they are allowed access to the job site. All personnel will complete the training and sign a form stating that they completed the training and understand all applicable agency regulations and consequences of non-compliance. The Project sponsor will keep the forms on file and make them available to the regulatory agencies upon request.
2. During construction, the barges performing the work will be configured to capture and contain the debris generated during any substructure or in-water work. If debris does reach the Bay, then personnel in workboats within the work area will retrieve the debris in a timely manner for proper handling and disposal. Debris will be disposed of at an authorized upland disposal site.
3. Fresh cement or concrete will not be allowed to enter the Bay. Construction waste will be collected and transported to an authorized upland disposal area, as appropriate, and in accordance with federal, state, and local laws and regulations.
4. All hazardous materials will be stored and handled in strict accordance with the Safety Data Sheets for the products. The storage and handling of potential pollution-causing and hazardous materials, including but not necessarily limited to gasoline, oil and paint, will be in accordance with applicable federal, state, and local laws and regulations.
5. Erodible construction material will be covered every night and during any rainfall event.
6. Construction crews will reduce the amount of disturbance within the Project Area to the minimum necessary to accomplish the Project.
7. Vessels and equipment that rely on internal combustion engines for power and/or propulsion will be kept in good working condition and compliant with California emission regulations.
8. Vehicles and equipment that are used during the course of construction will be fueled and serviced in an appropriate manner. For waterborne construction equipment, fueling will be performed from a fully contained or double-walled tank on a fuel barge or "boat," using a fuel transfer hose equipped with automatic shutoff valve. Fueling locations will be inspected after fueling to document that no spills have occurred. Any incidental spills will be cleaned up immediately.
9. Once the Project is completed, construction material, wastes, debris, sediment, rubbish, trash, fencing, and other construction items will be removed from the site

and transported to an authorized disposal area or recycling facility, as appropriate, in compliance with applicable federal, state, and local laws and regulations.

Special-Status Species Avoidance and Minimization Measures

In addition to biological control measures described above, the following measures will be implemented to minimize the potential adverse effects on sensitive species:

1. Fish Protections:
   - Illumination will be directed away from the water when night work is required.
   - Placement of supplemental erosion protection within areas that are exposed during low tide will occur only during low tides to minimize potential impacts on aquatic species.
2. Debris Removal:
   - Removal actions will be performed pursuant to requirements and pre-mobilization submittals including the Waste Management and Transportation Plan, and Erosion and Sediment Control Plan.
3. Pile Installation and Removal Restrictions:
   - Project-related pile driving activities will consist of piles being installed using a vibratory hammer to the maximum extent feasible. Vibratory pile installation and removal may be completed outside of the herring spawning season (between December 1 and March 15). If vibratory pile driving occurs during the peak seasonal salmonid migration period (November 1 to December 1), work will occur only during daylight hours, from 1 hour after sunrise to 1 hour before sunset. For vibratory pile driving operations occurring outside the peak seasonal salmonid migration period (June 1 to November 30), illumination will be directed away from the water when work outside of daylight hours is required.
   - In-water impact pile driving will be conducted between June 1 and November 30, to the maximum extent feasible, to avoid potential impacts to listed migratory fish species (present December 1 to May 31) and the marine mammal pupping season (occurs between March 1 and May 31). If pile installation using impact hammers must occur at times other than the approved work window, the Project applicant will obtain incidental take authorization from NMFS and CDFW, as necessary, to address potential impacts on listed fish species and implement all requested actions to avoid impacts.
   - Before pile driving hammers are operated at full capacity, a soft start will be implemented by starting the pile driving hammer at the lowest power setting and gradually ramping up to full power. All temporarily removed piles will be

replaced using the same pile size and similar material type where feasible. If treated wood is used to replace piles, material will be chosen as consistent with applicable and relevant guidance, which includes but is not limited to the following: California Coastal Commission guidelines (CCC 2019), which recommend that if using treated wood, "a type of preservative should be selected that minimizes the risk of aquatic and sediment toxicity." This commonly includes treatment such as ammoniacal copper zinc arsenate (ACZA), which will need to be further evaluated for applicability and risk for the Project.

  - If ACZA or other treated wood piles are required, these piles will be wrapped with a benign material (e.g., plastic wrap or polyurea coating) to prevent waters of the Bay from direct contact with the treated wood. All wrapped wood piles that may be subject to contact with docks, floating debris, and/or boats will be inspected on a yearly basis to confirm the integrity of the wrap and to repair any damaged areas.
  - Applicable building codes (e.g., State of California, Port).
  - The American Wood Protection Association standards (WWPI, no date).
  - Western Wood Preservers Institute recommendations: Best Management Practices for the Use of Preserved Wood in Aquatic and Sensitive Environments (WWPI et al., no date).
  - The Use of Treated Wood Products in Aquatic Environments: Guidelines to West Coast NOAA Fisheries Staff for Endangered Species Act and Essential Fish Habitat Consultations in the Alaska, Northwest and Southwest Regions (NOAA 2009).

- Sound attenuation methods will be implemented as required within Project authorizations (e.g., NMFS section 7 consultation documents, NMFS marine mammal take authorization, and/or CDFW Incidental Take Permit [ITP] requirements). Examples of methods of sound attenuation include use of a bubble curtain, marine pile driving energy attenuator (such as an isolation casing), or an impact hammer cushioned using a 12-inch-thick wood cushion. When a bubble curtain is required, the following performance standards will be implemented:

  - The bubble curtain must distribute air bubbles around 100 percent of the piling perimeter for the full depth of the water column.
  - The lowest bubble ring will be in contact with the mudline for the full circumference of the ring, and the weights attached to the bottom ring will ensure 100 percent mudline contact. No parts of the ring or other objects will prevent full mudline contact.
  - The contractor will ensure that personnel are trained in the proper balancing of air flow to the bubblers and will submit an

inspection/performance report within 72 hours following the performance test. Corrections to the attenuation device to meet the performance standards will occur prior to impact driving

- Turbidity curtains will be deployed during active dredging and capping operations. As required by agency authorizations, measures will be taken to minimize fish entrapment in the turbidity curtains. If conditions allow (i.e., turbidity conditions are suitably low within the containment as prescribed in the Surface Water Quality Monitoring Plan) curtains will be "reefed" (i.e., lifted to maintain the ballast and curtain bottom off of the sediment surface) to provide fish passage underneath.

4. Marine Mammal Protections:

   - For in-water construction, heavy machinery activities other than pile driving (i.e., dredging, placement of cap/armoring) will cease operations and reduce vessel speed to the minimum level required to maintain steerage and safe working conditions if a marine mammal comes within 10 meters of the vessel.
   - Monitoring of pinniped and cetacean disturbance zones will be conducted by a qualified NMFS-approved marine mammal observer in accordance with conditions established in the Marine Mammal Monitoring Plan. Requirements may include having the observer conduct surveys before and during impact pile driving as specified in the Marine Mammal Monitoring Plan. The observer may be required to inspect the established work zone and adjacent Bay waters and document the following during impact pile driving:
     - Maintain the safety zones established in the Marine Mammal Monitoring Plan around the sound source, for the protection of marine mammals in association with sound monitoring station distances
     - Halt work activities when a marine mammal enters the Level A safety zone and resume only after the animal has been gone from the area for a minimum of 15 minutes
     - When pinnipeds (seals and sea lions) are hauled out in the Project Area, ensure airborne sound levels generated by construction activities dissipate below 100 A-weighted decibels (dBA) upon reaching the animal.

5. Dredging/Capping Restrictions:

   - The approved Surface Water Quality Monitoring Plan will be fully implemented during dredging of contaminated sediments, and construction controls would be implemented as practicable to ensure surface water quality protection. Dredging and capping will be conducted between June 1 and November 30 in accordance with Long-Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region (LTMS) dredging windows. To minimize fish entrainment, turbidity curtains will only be deployed during active capping and dredging (i.e., when needed to minimize turbidity outside the active work area).

– All dredging activities will be implemented consistent with the standards and procedures set forth by the LTMS and associated NFMS Biological Opinion, federal Endangered Species Act Section 7(a)(2) Biological Opinion, LTMS, NMFS Consultation Number: WCR-2014-1599, dated July 9, 2015.

– Use of diver-assisted micro (hydraulic) dredging will be limited to the extent feasible. If hydraulic dredging is required, a CDFW-issued ITP will be obtained establishing measures to reduce potential for fish entrainment in suction dredging equipment. In addition to measures required within the ITP, the following restrictions apply:

  ▪ The dredge head will be primed and cleared as close to the bottom as possible, but no higher than 3 feet above the bottom.

  ▪ Suction dredging will occur only between June 1 and November 30.

  ▪ The dredge operator will maintain contact with the bottom at all times when the dredge is in operation.

  ▪ The dredge water intake (not dredge head) will be screened with an approved fish screen which meets CDFW screening criteria determined to be protective of longfin smelt.

6. Work Window:

   Restrictions on in-water construction activities (e.g., dredging, steel pile installation, and capping) during the approved environmental work window will be adhered to as established by NMFS at the conclusion of the federal Endangered Species Act Section 7 consultation and by CDFW when an ITP is issued. In-water work is generally restricted to "work windows" for San Francisco Bay, which run from June 1 through November 30 each year to protect sensitive species (USACE et al. 1998). Some in-water construction activities may be approved (during the permitting process) to take place outside these in-water work windows. These activities include but are not limited to:

– Removing, relocating, or replacing docks and other infrastructure

– Installing protection for structures, establishing staging areas, and deploying navigation aids

– Removing piles and installing temporary piles to support turbidity control features as well as pile replacement using vibratory installation methods outside of the herring spawning season (December 1 to March 15).

– Placing backfill and/or armor in some areas.

References

CCC. 2019. Use of Preservative-Treated Wood and Alternative Materials for Building Overwater and Waterfront Structure. Factsheet for the Marinas Interagency Coordinating Committee meeting, May 30, 2019. California Coastal Commission, Coastal Water Quality Program.

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USACE, USEPA, SFBCDC, and SFBRWQCB. 1998. Long-Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region. Policy Environmental Impact Statement/Programmatic Environmental Report. Volume I (Includes Appendices A, H, J, K, and M), Volume II (Appendices), Volume III (Comments and Responses on the Draft EIS/EIR). U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, San Francisco Bay Conservation and Development Commission, and San Francisco Bay Regional Water Quality Control Board.

WWPI. No date. Preserved Wood in Aquatic Environments. Available at: https://preservedwood.org/uses/aquatics. Western Wood Preservers Institute.

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Attachment B

Air Quality and GHG Calculations

Table B1. Equipment Usage and Duration

Phase	Equipment/Crew	Quantity	Hours		Days		Hours per Day	
			B and C[a]	E	B and C[a]	E	B and C[a]	E
Temporary Staging and Support	Excavator Longreach Excavator (Komatsu 490 - 359 HP)	1	165	315	33	63	5	5
Temporary Staging and Support	Bobcat Wheeled Bobcat S590	1	165	315	33	63	5	5
Temporary Staging and Support	Front End Loader Caterpillar 950	1	165	315	33	63	5	5
Temporary Staging and Support	Work Skiff 150 HP	2	2550	6435	340	858	7.5	7.5
Temporary Staging and Support	Survey Skiff 200 HP	1	174	432	29	72	6	6
Debris Removal	Excavator - Debris Removal Hydraulic Excavator with Thumb (185 HP)	1	18	36	2	4	9	9
Debris Removal	Spud Barge Deck Barge (40x100) w Poseidon Winch Powerpack (100 HP)	1	3	6	2	4	1.5	1.5
Equipment and Labor (shallow water removal)	Excavator (3cy bucket) Longreach Excavator (Komatsu 650 - 436 HP)	1	405	0	45	0	9	--
Equipment and Labor (shallow water removal)	Spud Barge Deck Barge (40x100) w Poseidon Winch Powerpack (100 HP)	1	67.5	0	45	0	1.5	--
Equipment and Labor (shallow water removal)	Scow for Material 400 T (30x90) Scow	3	0	0	135	0	0	--
Equipment and Labor (shallow water removal)	Scow Tug Material Transfer Tug (600 HP)	3	1080	0	135	0	8	--
Equipment and Labor (deep water removal, crane) - Option 1	Crane - Removal (3cy bucket) 200 T Crawler (Manitowac Model 2250 - 500 HP))	1	0	0	0	0	--	--
Equipment and Labor (deep water removal, crane) - Option 1	Spud Barge Deck Barge (40x100) w Poseidon Winch Powerpack (100 HP)	1	0	0	0	0	--	--
Equipment and Labor (deep water removal, crane) - Option 1	Scow for Material 400 T (30x90) Scow	3	0	0	0	0	--	--
Equipment and Labor (deep water removal, crane) - Option 1	Scow Tug Material Transfer Tug (600 HP)	3	0	0	0	0	--	--
Equipment and Labor (deep water removal, long-reach) - Option 2	Excavator - Long-reach (2cy bucket) Longreach Excavator (Komatsu 650 - 436 HP)	**1**	855	3420	95	380	9	9
Equipment and Labor (deep water removal, long-reach) - Option 2	Spud Barge Deck Barge (40x100) w Poseidon Winch Powerpack (100 HP)	1	142.5	570	95	380	1.5	1.5
Equipment and Labor (deep water removal, long-reach) - Option 2	Scow for Material 400 T (30x90) Scow	3	0	0	285	1140	0	0
Equipment and Labor (deep water removal, long-reach) - Option 2	Scow Tug Material Transfer Tug (600 HP)	3	2280	9120	285	1140	8	8
Backfilling (Offshore)	Excavator (3cy bucket) Longreach Excavator (Komatsu 650 - 436 HP)	1	297	567	33	63	9	9
Backfilling (Offshore)	Spud Barge Deck Barge (40x100) w Poseidon Winch Powerpack (100 HP)	1	49.5	94.5	33	63	1.5	1.5
Backfilling (Offshore)	Scow Tug Material Transfer Tug (600 HP)	3	792	1512	99	189	8	8
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	Excavator Longreach Excavator (Komatsu 650 - 436 HP)	1	35	5	7	1	5	5
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	Telebelt Barge Mounted Telebelt (Putzmeister TB 110 MACK MP7)	1	35	5	7	1	5	5
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	Spud Barge (low-profile for telebelt) Deck Barge (40x100) w Poseidon Winch Powerpack (100 HP)	2	21	3	14	2	1.5	1.5
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	Scow for Material 400 T (30x90) Scow	2	0	0	14	2	0	0
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	Scow Tug Material Transfer Tug (600 HP)	2	70	10	14	2	5	5
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - by hand	Scow Tug Material Transfer Tug (600 HP)	1	165	25	33	5	5	5
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - by hand	Dingo Walk Behind Dingo (75 HP)	1	297	45	33	5	9	9
Offloading, Stabilization and Dewatering - Pier 96	Material Handler Sennebogen 855	1	540	1905	108	381	5	5
Offloading, Stabilization and Dewatering - Pier 96	Excavator Excavator (Komatsu 490)	1	540	1905	108	381	5	5
Offloading, Stabilization and Dewatering - Pier 96	Front End Loader Caterpillar 950	1	540	1905	108	381	5	5
Offloading, Stabilization and Dewatering - Pier 96	Articulated Dump Truck Caterpillar 730	2	1080	3810	216	762	5	5
Offloading, Stabilization and Dewatering - Pier 96	Water Truck Knapheide KWT4	1	540	1905	108	381	5	5
Offloading, Stabilization and Dewatering - Pier 96	Fork Lift 4.5 T	1	540	1905	108	381	5	5

Notes:

Quantities and duration provided by Haley & Aldrich, June 2020.

-- = equipment not used during the phase

[a] The maximum number of hours or days was used between Remedial Response Area B and C.

Table B2. Worker Duration

Phase	Crew	Quantity of Workers	Workers on Site per Day	
			B and C[a]	**E**
Temporary Staging and Support	Site Security Officer (labor)	1	1	1
Temporary Staging and Support	Project Engineer	1	1	1
Temporary Staging and Support	Construction Manager	1	1	1
Temporary Staging and Support	H&S Office	1	1	1
Temporary Staging and Support	Superintendent	1	1	1
Temporary Staging and Support	Mechanic	1	1	1
Temporary Staging and Support	Operators	1	1	1
Temporary Staging and Support	Laborers	2	2	2
Temporary Staging and Support	General Field Technician	1	1	1
Monitoring	Field Technician	1	1	1
Debris Removal	Skilled Foreman	1	1	1
Debris Removal	Operators	3	3	3
Debris Removal	Laborers	4	4	4
Equipment and Labor (shallow water removal)	Skilled Foreman	1	1	--
Equipment and Labor (shallow water removal)	Operators	4	4	--
Equipment and Labor (shallow water removal)	Laborers	5	5	--
Equipment and Labor (deep water removal, long-reach) - Option 2	Skilled Foreman	1	1	6
Equipment and Labor (deep water removal, long-reach) - Option 2	Operators	4	6	24
Equipment and Labor (deep water removal, long-reach) - Option 2	Laborers	5	7	30
Backfilling (Offshore)	Skilled Foreman	1	2	4
Backfilling (Offshore)	Operators	4	7	14
Backfilling (Offshore)	Laborers	5	9	18
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	Skilled Foreman	1	7	1
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	Operators	4	28	4
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	Laborers	6	42	6
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - by hand	Skilled Foreman	1	11	2
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - by hand	Operators	0	0	0
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - by hand	Laborers	8	88	13
Offloading, Stabilization and Dewatering - Pier 96	Operators	5	10	10
Offloading, Stabilization and Dewatering - Pier 96	Laborers	6	10	10
Offloading, Stabilization and Dewatering - Pier 96	Skilled Foreman	1	10	10
Offloading, Stabilization and Dewatering - Pier 96	Mechanic	1	10	10

Notes:

Quantities and duration provided by Haley & Aldrich, June 2020.

-- = worker not used during the phase

[a] The maximum number of hours or days was used between Remedial Response Area B and C.

Table B3. Summary Tables—Total Workers and Worker Roundtrips per Work Phase

Phase	Working Days Per Phase		Total Workers on Site per Day		Total Worker Round Trips per Day	
	B and C[a]	E[b]	B and C[a]	E[b]	B and C[a]	E[b]
Temporary Staging and Support	167	214	10	5	20	10
Monitoring	167	214	1	1	2	1
Debris Removal	2	2	8	4	16	8
Equipment and Labor (shallow water removal)	44	0	10	--	20	--
Equipment and Labor (deep water removal, long-reach) - Option 2	93	190	15	30	30	60
Backfilling (Offshore)	33	31.5	18	18	37	35
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanica	7	0.5	77	6	154	11
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - by hanc	33	2.5	99	8	198	15
Offloading, Stabilization and Dewatering - Pier 96	119	198	41	20	83	40

Notes:
Quantities and duration provided by Haley & Aldrich, June 2020.
-- = worker not used during the phase
[a]The maximum number of hours or days was used between Remedial Response Area B and C.
[b]Because Area E occurs over a period of 2 years, the table shows number of workers for each year of work.

Table B4. Number of Truck Trips for Quantities for Each Phase of Work

Remedial Response Area	Phase	Total Number of Truck Round Trips	Quantity (tons)
Material Imports			
B and C[a]	Temporary Staging/Support	443	8,341
	Backfilling	1,047	22,979
	Cap/Armoring/Repair	278	6,082
	Offloading/Stabilization	76	820
	Total	**1,844**	**38,222**
Area E[b]	Temporary Staging/Support	134	2,091
	Backfilling	723	15,885
	Cap/Armoring/Repair	7	144
	Offloading/Stabilization	71	1,189
	Total	**934**	**19,309**
Sediment/Debris Exports			
B and C[a]	Transport to Landfill	1,015	22,296
Area E[b]	Transport to Landfill	1,402	61,632

Notes:

Quantities and duration provided by Haley & Aldrich, June 2020.

[a]The maximum number of hours or days was used between Remedial Response Area B and C.

[b]Because Area E occurs over a period of 2 years, the table shows number of truck trips and quantities for each year of work.

Table B5. Harbor Craft Criteria Pollutant Calculations

Phase	Equipment	Vessel Reference	Quantity
Temporary Staging and Support	Work Skiff (150 HP)	Propulsion	2
Temporary Staging and Support	Survey Skiff (200 HP)	Propulsion	1
Debris Removal	Spud Barge Deck Barge (40x100) w Poseidon Winch Powerpack (100 HP)	Auxiliary	1
Equipment and Labor (shallow water removal)	Excavator (3cy bucket) Longreach Excavator (Komatsu 650 - 436 HP)	Auxiliary	1
Equipment and Labor (shallow water removal)	Spud Barge Deck Barge (40x100) w Poseidon Winch Powerpack (100 HP)	Auxiliary	1
Equipment and Labor (shallow water removal)	Scow for Material 400 T (30x90) Scow	Propulsion	3
Equipment and Labor (shallow water removal)	Scow Tug Material Transfer Tug (600 HP)	Propulsion	3
Equipment and Labor (shallow water removal)	Scow Tug Material Transfer Tug (600 HP)	Auxiliary	3
Equipment and Labor (deep water removal, long-reach) - Option 2	Excavator - Long-reach (2cy bucket) Longreach Excavator (Komatsu 650 - 436 HP)	Auxiliary	1
Equipment and Labor (deep water removal, long-reach) - Option 2	Spud Barge Deck Barge (40x100) w Poseidon Winch Powerpack (100 HP)	Auxiliary	1
Equipment and Labor (deep water removal, long-reach) - Option 2	Scow for Material 400 T (30x90) Scow	Propulsion	3
Equipment and Labor (deep water removal, long-reach) - Option 2	Scow Tug Material Transfer Tug (600 HP)	Propulsion	3
Equipment and Labor (deep water removal, long-reach) - Option 2	Scow Tug Material Transfer Tug (600 HP)	Auxiliary	3
Backfilling (Offshore)	Excavator (3cy bucket) Longreach Excavator (Komatsu 650 - 436 HP)	Auxiliary	1
Backfilling (Offshore)	Spud Barge Deck Barge (40x100) w Poseidon Winch Powerpack (100 HP)	Auxiliary	1
Backfilling (Offshore)	Scow Tug Material Transfer Tug (600 HP)	Propulsion	3
Backfilling (Offshore)	Scow Tug Material Transfer Tug (600 HP)	Auxiliary	3
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	Excavator Longreach Excavator (Komatsu 650 - 436 HP)	Auxiliary	1
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	Telebelt Barge Mounted Telebelt (Putzmeister TB 110 MACK MP7)	Auxiliary	1
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	Spud Barge (low-profile for telebelt) Deck Barge (40x100) w Poseidon Winch Powerpack (100 HP)	Auxiliary	2
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	Scow for Material 400 T (30x90) Scow	Propulsion	2
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	Scow Tug Material Transfer Tug (600 HP)	Propulsion	2
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	Scow Tug Material Transfer Tug (600 HP)	Auxiliary	2
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - by hand	Scow Tug Material Transfer Tug (600 HP)	Propulsion	1
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - by hand	Scow Tug Material Transfer Tug (600 HP)	Auxiliary	1

Table B5. Harbor Craft Criteria Pollutant Calculations

Phase	Marine Equipment Input Parameters: Hours, Area B and C	Hours, Area E	Days, Area B and C	Days, Area E	Hours per Day, Area B and C	Hours per Day, Area E	HP	Load Factor [a]	Engine Age (yr) [b]	Useful Life (yr) [a]	Deterioration Factor (D) [a]: ROG	NOX	PM2.5	PM10
Temporary Staging and Support	165	315	33	63	5	5	150	0.45	18	17	0.28	0.14	0.44	0.44
Temporary Staging and Support	165	315	33	63	5	5	200	0.45	18	17	0.28	0.14	0.44	0.44
Debris Removal	2550	6435	340	858	7.5	7.5	100	0.8	18	16	0.28	0.14	0.44	0.44
Equipment and Labor (shallow water removal)	18	36	2	4	9	9	436	0.51	18	16	0.44	0.21	0.67	0.67
Equipment and Labor (shallow water removal)	405	0	45	0	9	0	100	0.8	18	16	0.28	0.14	0.44	0.44
Equipment and Labor (shallow water removal)	67.5	0	45	0	1.5	0	--	--	--	--	--	--	--	--
Equipment and Labor (shallow water removal)	0	0	135	0	0	0	600	0.5	18	21	0.44	0.21	0.67	0.67
Equipment and Labor (shallow water removal)	1080	0	135	0	8	0	600	0.31	18	22.5	0.44	0.21	0.67	0.67
Equipment and Labor (deep water removal, long-reach) - Option 2	0	0	0	0	0	0	436	0.51	18	16	0.44	0.21	0.67	0.67
Equipment and Labor (deep water removal, long-reach) - Option 2	0	0	0	0	0	0	100	0.8	18	16	0.28	0.14	0.44	0.44
Equipment and Labor (deep water removal, long-reach) - Option 2	855	3420	95	380	9	9	--	--	--	--	--	--	--	--
Equipment and Labor (deep water removal, long-reach) - Option 2	142.5	570	95	380	1.5	1.5	600	0.5	18	21	0.44	0.21	0.67	0.67
Equipment and Labor (deep water removal, long-reach) - Option 2	0	0	285	1140	0	0	600	0.31	18	22.5	0.44	0.21	0.67	0.67
Backfilling (Offshore)	297	567	33	63	9	9	436	0.51	18	16	0.44	0.21	0.67	0.67
Backfilling (Offshore)	792	1512	99	189	8	8	100	0.8	18	16	0.28	0.14	0.44	0.44
Backfilling (Offshore)	35	5	7	1	5	5	600	0.5	18	21	0.44	0.21	0.67	0.67
Backfilling (Offshore)	35	5	7	1	5	5	600	0.31	18	22.5	0.44	0.21	0.67	0.67
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	0	0	14	2	0	0	436	0.51	18	16	0.44	0.21	0.67	0.67
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	165	25	33	5	5	5	100	0.8	18	16	0.28	0.14	0.44	0.44
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	540	1905	108	381	5	5	100	0.8	18	16	0.28	0.14	0.44	0.44
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	540	1905	108	381	5	5	--	--	--	--	--	--	--	--
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	540	1905	108	381	5	5	600	0.5	18	21	0.44	0.21	0.67	0.67
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	1080	3810	216	762	5	5	600	0.31	18	22.5	0.44	0.21	0.67	0.67
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - by hand	540	1905	108	381	5	5	600	0.5	18	21	0.44	0.21	0.67	0.67
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - by hand	540	1905	108	381	5	5	600	0.31	18	22.5	0.44	0.21	0.67	0.67

Table B5. Harbor Craft Criteria Pollutant Calculations

Phase	Emission Factor (EF) [a]				Criteria Pollutants							
					Area B and C				Area E			
	ROG (g/HP-hr)	NOx (g/HP-hr)	PM2.5 (g/HP-hr)	PM10 (g/HP-hr)	ROG (lb/day)	NOx (lb/day)	PM2.5 (lb/day)	PM10 (lb/day)	ROG (lb/day)	NOx (lb/day)	PM2.5 (lb/day)	PM10 (lb/day)
Temporary Staging and Support	0.68	7.31	0.36	0.36	1.3	12	0.63	0.63	1.3	12	0.63	0.63
Temporary Staging and Support	0.68	7.31	0.36	0.36	0.87	7.9	0.42	0.42	0.87	7.9	0.42	0.42
Debris Removal	1.1979	8.75	0.69	0.69	2.1	13	1.1	1.1	2.1	13	1.1	1.1
Equipment and Labor (shallow water removal)	0.3872	6.25	0.15	0.15	2.6	32	0.93	0.93	2.6	32	0.9	0.9
Equipment and Labor (shallow water removal)	1.1979	8.75	0.69	0.69	2.5	15	1.3	1.3	2.5	15	1.3	1.3
Equipment and Labor (shallow water removal)	--	--	--	--	0	0	0	0	0	0	0	0
Equipment and Labor (shallow water removal)	0.68	7.31	0.36	0.36	0	0	0	0	0	0	0	0
Equipment and Labor (shallow water removal)	0.8092	7.31	0.32	0.32	11	80	3.9	3.9	11	80	3.9	3.9
Equipment and Labor (deep water removal, long-reach) - Option 2	0.3872	6.25	0.15	0.15	0	0	0	0	0	0	0	0
Equipment and Labor (deep water removal, long-reach) - Option 2	1.1979	8.75	0.69	0.69	0	0	0	0	0	0	0	0
Equipment and Labor (deep water removal, long-reach) - Option 2	--	--	--	--	0	0	0	0	0	0	0	0
Equipment and Labor (deep water removal, long-reach) - Option 2	0.68	7.31	0.36	0.36	2.8	24	1.3	1.3	2.8	24	1.3	1.3
Equipment and Labor (deep water removal, long-reach) - Option 2	0.8092	7.31	0.32	0.32	0	0	0	0	0	0	0	0
Backfilling (Offshore)	0.3872	6.25	0.15	0.15	2.6	32	0.93	0.93	2.6	32	0.93	0.93
Backfilling (Offshore)	1.1979	8.75	0.69	0.69	2.2	14	1.2	1.2	2.2	14	1.2	1.2
Backfilling (Offshore)	0.68	7.31	0.36	0.36	9.3	81	4.5	4.5	9.3	81	4.5	4.5
Backfilling (Offshore)	0.8092	7.31	0.32	0.32	6.7	50	2.4	2.4	6.7	50	2.4	2.4
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	0.3872	6.25	0.15	0.15	0	0	0	0	0	0	0	0
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	1.1979	8.75	0.69	0.69	1.4	8.5	0.73	0.73	1.4	8.5	0.73	0.73
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	1.1979	8.75	0.69	0.69	2.8	17	1.5	1.5	2.80	17	1.5	1.5
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	--	--	--	--	0	0	0	0	0	0	0	0
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	0.68	7.31	0.36	0.36	6.2	54	3	3	6.2	54	3	3
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	0.8092	7.31	0.32	0.32	4.5	33	1.6	1.6	4.5	33	1.6	1.6
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - by hand	0.68	7.31	0.36	0.36	3.1	27	1.5	1.5	3.1	27	1.5	1.5
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - by hand	0.8092	7.31	0.32	0.32	2.2	17	0.81	0.81	2.2	17	0.81	0.81

Table B5. Harbor Craft Criteria Pollutant Calculations

Notes:

CARB = California Air Resources Board
CO2eq = CO2 equivalent
GHG = greenhouse gas
g/hp-hr = grams per horsepower hour
lb = pound
Nox = oxides of nitrogen

1 ton = 907,185 grams
1 pound = 454 grams
PM10 = respirable particulate matter with an aerodynamic resistance diameter of 10 microns or less
PM2.5 = fine particulate matter with aerodynamic resistance diameter of 2.5 microns or less
ROG = reactive organic gas

Harbor Craft Emissions = EF_0 x F x (1 + D x A/UL) x HP x LF x Hr

Where:

EF_0 is the model year, horsepower and engine use (propulsion or auxiliary) specific zero hour emission factor (when engine is new).
F is the fuel correction factor which accounts for emission reduction benefits from burning cleaner fuel, equals 1.0 for ROG, 0.948 for Nox, and 0.800 for PM.
D is the horsepower and pollutant specific engine deterioration factor, which is the percentage increase of emission factors at the end of the useful life of the engine.
A is the age of the engine when the emissions are estimated.
UL is the vessel type and engine use specific engine useful life.
HP is rated horsepower of the engine.
LF is the vessel type and engine use specific engine load factor.
Hr is the number of annual operating hours of the engine.

Fuel Correction Factor

ROG
NOx
PM

[a] Default values derived from the CARB (2007) Draft Emissions Methodology for Commercial Harbor Craft Operating in California. Sources include the CARB Harbor Craft Emissions Database - crew and supply and barge and dredge emissions inventories

[b] According to a CARB survey, the average age of commercial harbor craft propulsion engines is about 18 years old (CARB 2007). The same age was assumed for auxiliary engines.

[c] A single emission factor of 568.3 g/hp-hr was used in accordance with the CARB methodology (CARB 2007).

Table B6. Harbor Craft Greenhouse Gases Calculations

Phase	Equipment	Vessel Reference	Quantity
Temporary Staging and Support	Work Skiff (150 HP)	Propulsion	2
Temporary Staging and Support	Survey Skiff (200 HP)	Propulsion	1
Debris Removal	Spud Barge Deck Barge (40x100) w Poseidon Winch Powerpack (100 HP)	Auxiliary	1
Equipment and Labor (shallow water removal)	Excavator (3cy bucket) Longreach Excavator (Komatsu 650 - 436 HP)	Auxiliary	1
Equipment and Labor (shallow water removal)	Spud Barge Deck Barge (40x100) w Poseidon Winch Powerpack (100 HP)	Auxiliary	1
Equipment and Labor (shallow water removal)	Scow for Material 400 T (30x90) Scow	Propulsion	3
Equipment and Labor (shallow water removal)	Scow Tug Material Transfer Tug (600 HP)	Propulsion	3
Equipment and Labor (shallow water removal)	Scow Tug Material Transfer Tug (600 HP)	Auxiliary	3
Equipment and Labor (deep water removal, long-reach) - Option 2	Excavator - Long-reach (2cy bucket) Longreach Excavator (Komatsu 650 - 436	Auxiliary	1
Equipment and Labor (deep water removal, long-reach) - Option 2	Spud Barge Deck Barge (40x100) w Poseidon Winch Powerpack (100 HP)	Auxiliary	1
Equipment and Labor (deep water removal, long-reach) - Option 2	Scow for Material 400 T (30x90) Scow	Propulsion	3
Equipment and Labor (deep water removal, long-reach) - Option 2	Scow Tug Material Transfer Tug (600 HP)	Propulsion	3
Equipment and Labor (deep water removal, long-reach) - Option 2	Scow Tug Material Transfer Tug (600 HP)	Auxiliary	3
Backfilling (Offshore)	Excavator (3cy bucket) Longreach Excavator (Komatsu 650 - 436 HP)	Auxiliary	1
Backfilling (Offshore)	Spud Barge Deck Barge (40x100) w Poseidon Winch Powerpack (100 HP)	Auxiliary	1
Backfilling (Offshore)	Scow Tug Material Transfer Tug (600 HP)	Propulsion	3
Backfilling (Offshore)	Scow Tug Material Transfer Tug (600 HP)	Auxiliary	3
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	Excavator Longreach Excavator (Komatsu 650 - 436 HP)	Auxiliary	1
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	Telebelt Barge Mounted Telebelt (Putzmeister TB 110 MACK MP7)	Auxiliary	1
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	Spud Barge (low-profile for telebelt) Deck Barge (40x100) w Poseidon Winch P	Auxiliary	2
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	Scow for Material 400 T (30x90) Scow	Propulsion	2
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	Scow Tug Material Transfer Tug (600 HP)	Propulsion	2
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	Scow Tug Material Transfer Tug (600 HP)	Auxiliary	2
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - by hand	Scow Tug Material Transfer Tug (600 HP)	Propulsion	1
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - by hand	Scow Tug Material Transfer Tug (600 HP)	Auxiliary	1

Table B6. Harbor Craft Greenhouse Gases Calculations

Phase	Marine Equipment Input Parameters: Hours, Area A and B	Hours, Area B and C	Hours, Area B and D	Hours, Area E	Days, Area A and B	Days, Area B and C	Days, Area B and D	Days, Area E	Hours per Day, Area A and B	Hours per Day, Area B and C	Hours per Day, Area B and D	Hours per Day, Area E	HP	Load Factor [a]
Temporary Staging and Support	90	165	105	315	18	33	21	63	5	5	5	5	150	0.45
Temporary Staging and Support	90	165	105	315	18	33	21	63	5	5	5	5	200	0.45
Debris Removal	1845	2550	1890	6435	246	340	252	858	7.5	7.5	7.5	7.5	100	0.8
Equipment and Labor (shallow water removal)	27	18	18	36	3	2	2	4	9	9	9	9	436	0.51
Equipment and Labor (shallow water removal)	405	405	405	0	45	45	45	0	9	9	9	0	100	0.8
Equipment and Labor (shallow water removal)	67.5	67.5	67.5	0	45	45	45	0	1.5	1.5	1.5	0	--	--
Equipment and Labor (shallow water removal)	0	0	0	0	135	135	135	0	0	0	0	0	600	0.5
Equipment and Labor (shallow water removal)	1080	1080	1080	0	135	135	135	0	8	8	8	0	600	0.31
Equipment and Labor (deep water removal, long-reach) - Option 2	0	0	0	0	0	0	0	0	0	0	0	0	436	0.51
Equipment and Labor (deep water removal, long-reach) - Option 2	0	0	0	0	0	0	0	0	0	0	0	0	100	0.8
Equipment and Labor (deep water removal, long-reach) - Option 2	567	855	621	3420	63	95	69	380	9	9	9	9	--	--
Equipment and Labor (deep water removal, long-reach) - Option 2	94.5	142.5	103.5	570	63	95	69	380	1.5	1.5	1.5	1.5	600	0.5
Equipment and Labor (deep water removal, long-reach) - Option 2	0	0	0	0	189	285	207	1140	0	0	0	0	600	0.31
Backfilling (Offshore)	162	297	189	567	18	33	21	63	9	9	9	9	436	0.51
Backfilling (Offshore)	432	792	504	1512	54	99	63	189	8	8	8	8	100	0.8
Backfilling (Offshore)	5	35	5	5	1	7	1	1	5	5	5	5	600	0.5
Backfilling (Offshore)	5	35	5	5	1	7	1	1	5	5	5	5	600	0.31
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	0	0	0	0	2	14	2	2	0	0	0	0	436	0.51
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	20	165	20	25	4	33	4	5	5	5	5	5	100	0.8
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	380	540	375	1905	76	108	75	381	5	5	5	5	100	0.8
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	380	540	375	1905	76	108	75	381	5	5	5	5	--	--
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	380	540	375	1905	76	108	75	381	5	5	5	5	600	0.5
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	760	1080	750	3810	152	216	150	762	5	5	5	5	600	0.31
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - by hand	380	540	375	1905	76	108	75	381	5	5	5	5	600	0.5
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - by hand	380	540	375	1905	76	108	75	381	5	5	5	5	600	0.31

Table B6. Harbor Craft Greenhouse Gases Calculations

Phase	Emission Factor (EF) [a]	GHG			
		A + B	C + B	D + B	E
	CO2eq (g/hp-hr) [b]	CO2eq (tons/day)	CO2eq (tons/day)	CO2eq (tons/day)	CO2eq (tons/year)
Temporary Staging and Support	568.3	7.6	14	8.9	27
Temporary Staging and Support	568.3	5.1	9.3	5.9	18
Debris Removal	568.3	92	130	95	320
Equipment and Labor (shallow water removal)	568.3	3.8	2.5	2.5	5
Equipment and Labor (shallow water removal)	568.3	20	20	20	0
Equipment and Labor (shallow water removal)	568.3	0	0	0	0
Equipment and Labor (shallow water removal)	568.3	0	0	0	0
Equipment and Labor (shallow water removal)	568.3	380	380	380	0
Equipment and Labor (deep water removal, long-reach) - Option 2	568.3	0	0	0	0
Equipment and Labor (deep water removal, long-reach) - Option 2	568.3	0	0	0	0
Equipment and Labor (deep water removal, long-reach) - Option 2	568.3	0	0	0	0
Equipment and Labor (deep water removal, long-reach) - Option 2	568.3	53	80	58	320
Equipment and Labor (deep water removal, long-reach) - Option 2	568.3	0	0	0	0
Backfilling (Offshore)	568.3	23	41	26	79
Backfilling (Offshore)	568.3	22	40	25	76
Backfilling (Offshore)	568.3	2.8	20	2.8	2.8
Backfilling (Offshore)	568.3	1.7	12	1.7	1.7
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	568.3	0	0	0	0
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	568.3	1	8.3	1	1.3
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	568.3	38	54	38	190
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	568.3	0	0	0	0
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	568.3	140	200	140	720
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - mechanical	568.3	180	250	170	890
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - by hand	568.3	71	100	70	360
Equipment and Labor (Cap/Armoring/Repair, Without Removal) - by hand	568.3	44	63	44	220

Notes:
Equation
CO2eq = EF0 x HP x LF x conversion factor x Hr
Where:
EF0 is the model year, horsepower and engine use (propulsion or auxiliary) specific zero hour emission factor (when engine is new).
HP is rated horsepower of the engine.
LF is the vessel type and engine use specific engine load factor.
Conversion factor = (1 ton/907185 grams)
Hr is the number of annual operating hours of the engine.

A single CO2 emission factor of 568.3 g/HP-hr and a fuel usage of 184 g/HP-hr was used in accordance with CARB methodology (CARB 2007).

[a] Default values derived from the CARB (2007) Draft Emissions Methodology for Commercial Harbor Craft Operating in California. Sources include the CARB Harbor Craft Emissions Database - crew and supply and barge and dredge emissions inventories
[b] A single emission factor of 568.3 g/hp-hr was used in accordance with the CARB methodology (CARB 2007).

Pier 39-43.5 - Area C and B

San Francisco County, 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	5.70	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2030
Utility Company	City and County of San Francisco				
CO2 Intensity (lb/MWhr)	76.28	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Pier 39-43.5 - Area C and B - San Francisco County, Annual

Project Characteristics -

Land Use - Total acreage for Area B and C

Construction Phase - Arbitrary date ranges chosen based on the number of work days in each phase and the construction schedule.

Off-road Equipment - project-specific

Off-road Equipment - None - harbor equipment only

Off-road Equipment - project-specific

Off-road Equipment - None - harbor equipment only

Off-road Equipment - None - harbor equipment only

Off-road Equipment - project-specific: other material handling equipment = material handler; off-highway truck = dump truck; sweeper/scrubber = water truck

Off-road Equipment - None - harbor equipment only

Off-road Equipment - Project-specific: tractor/loader/backhoe = dingo

Off-road Equipment - None - harbor equipment only

Off-road Equipment - None - harbor equipment only

Grading - Project-specific material import and exports for Area B and C.

Trips and VMT - project-specific for Area B and C trips rounded up. Total # of hauling trips are for Area B and C combined. Tranportation trip length average between all landfills = 100 miles.

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Parking	150	0
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	150	0
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	100	0
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	150	0
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	100	0
tblConstructionPhase	NumDays	20.00	33.00
tblConstructionPhase	NumDays	20.00	33.00
tblConstructionPhase	NumDays	10.00	167.00
tblConstructionPhase	NumDays	10.00	167.00

tblConstructionPhase	NumDays	10.00	119.00
tblConstructionPhase	NumDays	10.00	108.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblFleetMix	HHD	9.6790e-003	0.00
tblFleetMix	LDA	0.60	0.00
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT2	0.19	0.00
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD2	5.2680e-003	0.00
tblFleetMix	MCY	5.7550e-003	0.00
tblFleetMix	MDV	0.09	0.00
tblFleetMix	MH	5.9500e-004	0.00
tblFleetMix	MHD	0.03	0.00
tblFleetMix	OBUS	4.2840e-003	0.00
tblFleetMix	SBUS	9.5800e-004	0.00
tblFleetMix	UBUS	2.3520e-003	0.00
tblGrading	MaterialExported	0.00	18,580.00
tblGrading	MaterialImported	0.00	6,082.00

tblGrading	MaterialImported	0.00	22,979.00
tblGrading	MaterialImported	0.00	8,341.00
tblGrading	MaterialImported	0.00	820.00
tblLandUse	LotAcreage	0.00	5.70
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	UsageHours	8.00	9.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblTripsAndVMT	HaulingTripLength	20.00	100.00
tblTripsAndVMT	HaulingTripNumber	825.00	1,844.00
tblTripsAndVMT	HaulingTripNumber	81.00	0.00
tblTripsAndVMT	HaulingTripNumber	1,837.00	1,015.00

tblTripsAndVMT	HaulingTripNumber	601.00	0.00
tblTripsAndVMT	HaulingTripNumber	2,272.00	0.00
tblTripsAndVMT	WorkerTripNumber	8.00	1.00
tblTripsAndVMT	WorkerTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	3.00	8.00
tblTripsAndVMT	WorkerTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	18.00	2.00
tblTripsAndVMT	WorkerTripNumber	3.00	6.00
tblTripsAndVMT	WorkerTripNumber	0.00	1.00

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					
2023	0.1168	1.4351	1.5057	4.8600e-003	0.0686	0.0405	0.1091	0.0180	0.0373	0.0553	0.0000	480.9144	480.9144	0.1188	0.0000	483.8847
Maximum	**0.1168**	**1.4351**	**1.5057**	**4.8600e-003**	**0.0686**	**0.0405**	**0.1091**	**0.0180**	**0.0373**	**0.0553**	**0.0000**	**480.9144**	**480.9144**	**0.1188**	**0.0000**	**483.8847**

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					
2023	0.1168	1.4351	1.5057	4.8600e-003	0.0686	0.0405	0.1091	0.0180	0.0373	0.0553	0.0000	480.9142	480.9142	0.1188	0.0000	483.8845
Maximum	**0.1168**	**1.4351**	**1.5057**	**4.8600e-003**	**0.0686**	**0.0405**	**0.1091**	**0.0180**	**0.0373**	**0.0553**	**0.0000**	**480.9142**	**480.9142**	**0.1188**	**0.0000**	**483.8845**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**3-6-2023**	**6-5-2023**	0.2257	0.2257
2	**6-6-2023**	**9-5-2023**	0.7014	0.7014
3	**9-6-2023**	**9-30-2023**	0.2161	0.2161
		Highest	0.7014	0.7014

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**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	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**	**N20**	**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	Moblization/Site Prep	Site Preparation	3/6/2023	9/15/2023	6	167	
2	Monitoring	Site Preparation	4/1/2023	10/12/2023	6	167	
3	Sediment and Debris Removal	Trenching	6/5/2023	6/6/2023	6	2	
4	Shallow Water Removal	Trenching	6/5/2023	7/25/2023	6	44	
5	Deep Water Removal	Trenching	6/5/2023	9/20/2023	6	93	
6	Offloading/Stablization/Dewatering	Site Preparation	7/10/2023	11/24/2023	6	119	
7	Transportation	Site Preparation	7/10/2023	11/11/2023	6	108	
8	Cap/Armouring - hand	Grading	7/10/2023	8/16/2023	6	33	
9	Backfilling	Grading	7/10/2023	8/16/2023	6	33	
10	Cap/Armouring - mechanical	Trenching	7/10/2023	7/17/2023	6	7	

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; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Moblization/Site Prep	Concrete/Industrial Saws	0	8.00	81	0.73
Moblization/Site Prep	Excavators	1	5.00	158	0.38
Moblization/Site Prep	Off-Highway Trucks	0	8.00	402	0.38
Moblization/Site Prep	Rubber Tired Dozers	0	8.00	247	0.40
Moblization/Site Prep	Tractors/Loaders/Backhoes	2	5.00	97	0.37
Monitoring	Rubber Tired Dozers	0	8.00	247	0.40

Monitoring	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Sediment and Debris Removal	Excavators	1	9.00	158	0.38
Sediment and Debris Removal	Graders	0	8.00	187	0.41
Sediment and Debris Removal	Rubber Tired Dozers	0	8.00	247	0.40
Sediment and Debris Removal	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Shallow Water Removal	Cranes	0	7.00	231	0.29
Shallow Water Removal	Forklifts	0	8.00	89	0.20
Shallow Water Removal	Generator Sets	0	8.00	84	0.74
Shallow Water Removal	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Shallow Water Removal	Welders	0	8.00	46	0.45
Deep Water Removal	Pavers	0	8.00	130	0.42
Deep Water Removal	Paving Equipment	0	8.00	132	0.36
Deep Water Removal	Rollers	0	8.00	80	0.38
Cap/Armouring - hand	Air Compressors	0	6.00	78	0.48
Cap/Armouring - hand	Excavators	0	8.00	158	0.38
Cap/Armouring - hand	Graders	0	8.00	187	0.41
Cap/Armouring - hand	Rubber Tired Dozers	0	8.00	247	0.40
Cap/Armouring - hand	Tractors/Loaders/Backhoes	1	9.00	97	0.37
Backfilling	Excavators	0	8.00	158	0.38
Backfilling	Graders	0	8.00	187	0.41
Backfilling	Rubber Tired Dozers	0	8.00	247	0.40
Backfilling	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Offloading/Stablization/Dewatering	Excavators	1	5.00	158	0.38
Offloading/Stablization/Dewatering	Forklifts	1	5.00	89	0.20
Offloading/Stablization/Dewatering	Off-Highway Trucks	2	5.00	402	0.38
Offloading/Stablization/Dewatering	Other Material Handling Equipment	1	5.00	168	0.40
Offloading/Stablization/Dewatering	Rubber Tired Dozers	0	8.00	247	0.40

Offloading/Stablization/Dewatering	Sweepers/Scrubbers	1	5.00	64	0.46
Offloading/Stablization/Dewatering	Tractors/Loaders/Backhoes	1	5.00	97	0.37
Transportation	Off-Highway Trucks	0	8.00	402	0.38
Transportation	Rubber Tired Dozers	0	8.00	247	0.40
Transportation	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Moblization/Site Prep	3	1.00	0.00	1,844.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Monitoring	0	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Sediment and Debris Removal	1	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Shallow Water Removal	0	2.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Deep Water Removal	0	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Cap/Armouring - hand	1	6.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Backfilling	0	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Cap/Armouring - mechanical			0.00	0.00	10.80	7.30				
Offloading/Stablization/Dewatering	7	2.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Transportation	0	0.00	0.00	1,015.00	10.80	7.30	100.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Moblization/Site Prep - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.7000e-004	0.0000	9.7000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0256	0.2411	0.4029	5.9000e-004		0.0119	0.0119		0.0109	0.0109	0.0000	52.2324	52.2324	0.0169	0.0000	52.6547
Total	**0.0256**	**0.2411**	**0.4029**	**5.9000e-004**	**9.7000e-004**	**0.0119**	**0.0128**	**1.5000e-004**	**0.0109**	**0.0111**	**0.0000**	**52.2324**	**52.2324**	**0.0169**	**0.0000**	**52.6547**

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	5.0400e-003	0.2069	0.1001	7.0000e-004	0.0155	4.1000e-004	0.0159	4.2500e-003	4.0000e-004	4.6400e-003	0.0000	76.7256	76.7256	0.0149	0.0000	77.0978
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	2.1000e-004	1.2000e-004	1.5100e-003	1.0000e-005	6.6000e-004	0.0000	6.6000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5598	0.5598	1.0000e-005	0.0000	0.5600
Total	**5.2500e-003**	**0.2070**	**0.1016**	**7.1000e-004**	**0.0161**	**4.1000e-004**	**0.0165**	**4.4300e-003**	**4.0000e-004**	**4.8200e-003**	**0.0000**	**77.2853**	**77.2853**	**0.0149**	**0.0000**	**77.6578**

3.2 Moblization/Site Prep - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.7000e-004	0.0000	9.7000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0256	0.2411	0.4029	5.9000e-004		0.0119	0.0119		0.0109	0.0109	0.0000	52.2323	52.2323	0.0169	0.0000	52.6546
Total	**0.0256**	**0.2411**	**0.4029**	**5.9000e-004**	**9.7000e-004**	**0.0119**	**0.0128**	**1.5000e-004**	**0.0109**	**0.0111**	**0.0000**	**52.2323**	**52.2323**	**0.0169**	**0.0000**	**52.6546**

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	5.0400e-003	0.2069	0.1001	7.0000e-004	0.0155	4.1000e-004	0.0159	4.2500e-003	4.0000e-004	4.6400e-003	0.0000	76.7256	76.7256	0.0149	0.0000	77.0978
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	2.1000e-004	1.2000e-004	1.5100e-003	1.0000e-005	6.6000e-004	0.0000	6.6000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5598	0.5598	1.0000e-005	0.0000	0.5600
Total	**5.2500e-003**	**0.2070**	**0.1016**	**7.1000e-004**	**0.0161**	**4.1000e-004**	**0.0165**	**4.4300e-003**	**4.0000e-004**	**4.8200e-003**	**0.0000**	**77.2853**	**77.2853**	**0.0149**	**0.0000**	**77.6578**

3.3 Monitoring - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	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**	**0.0000**	**0.0000**

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	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	2.1000e-004	1.2000e-004	1.5100e-003	1.0000e-005	6.6000e-004	0.0000	6.6000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5598	0.5598	1.0000e-005	0.0000	0.5600
Total	**2.1000e-004**	**1.2000e-004**	**1.5100e-003**	**1.0000e-005**	**6.6000e-004**	**0.0000**	**6.6000e-004**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.5598**	**0.5598**	**1.0000e-005**	**0.0000**	**0.5600**

3.3 Monitoring - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	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**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	2.1000e-004	1.2000e-004	1.5100e-003	1.0000e-005	6.6000e-004	0.0000	6.6000e-004	1.8000e-004	0.0000	1.8000e-004	0.0000	0.5598	0.5598	1.0000e-005	0.0000	0.5600
Total	**2.1000e-004**	**1.2000e-004**	**1.5100e-003**	**1.0000e-005**	**6.6000e-004**	**0.0000**	**6.6000e-004**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**0.5598**	**0.5598**	**1.0000e-005**	**0.0000**	**0.5600**

3.4 Sediment and Debris Removal - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.1000e-004	1.7400e-003	3.6600e-003	1.0000e-005		9.0000e-005	9.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.5104	0.5104	1.7000e-004	0.0000	0.5145
Total	**2.1000e-004**	**1.7400e-003**	**3.6600e-003**	**1.0000e-005**		**9.0000e-005**	**9.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.5104**	**0.5104**	**1.7000e-004**	**0.0000**	**0.5145**

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	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	2.0000e-005	1.0000e-005	1.4000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0536	0.0536	0.0000	0.0000	0.0537
Total	**2.0000e-005**	**1.0000e-005**	**1.4000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0536**	**0.0536**	**0.0000**	**0.0000**	**0.0537**

3.4 Sediment and Debris Removal - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.1000e-004	1.7400e-003	3.6600e-003	1.0000e-005		9.0000e-005	9.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.5104	0.5104	1.7000e-004	0.0000	0.5145
Total	**2.1000e-004**	**1.7400e-003**	**3.6600e-003**	**1.0000e-005**		**9.0000e-005**	**9.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.5104**	**0.5104**	**1.7000e-004**	**0.0000**	**0.5145**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	2.0000e-005	1.0000e-005	1.4000e-004	0.0000	6.0000e-005	0.0000	6.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0536	0.0536	0.0000	0.0000	0.0537
Total	**2.0000e-005**	**1.0000e-005**	**1.4000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0536**	**0.0536**	**0.0000**	**0.0000**	**0.0537**

3.5 Shallow Water Removal - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	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**

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	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	1.1000e-004	7.0000e-005	8.0000e-004	0.0000	3.5000e-004	0.0000	3.5000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2950	0.2950	1.0000e-005	0.0000	0.2951
Total	**1.1000e-004**	**7.0000e-005**	**8.0000e-004**	**0.0000**	**3.5000e-004**	**0.0000**	**3.5000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2950**	**0.2950**	**1.0000e-005**	**0.0000**	**0.2951**

3.5 Shallow Water Removal - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	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 Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 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	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	1.1000e-004	7.0000e-005	8.0000e-004	0.0000	3.5000e-004	0.0000	3.5000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2950	0.2950	1.0000e-005	0.0000	0.2951
Total	**1.1000e-004**	**7.0000e-005**	**8.0000e-004**	**0.0000**	**3.5000e-004**	**0.0000**	**3.5000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2950**	**0.2950**	**1.0000e-005**	**0.0000**	**0.2951**

3.6 Deep Water Removal - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	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**

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	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	1.2000e-004	7.0000e-005	8.4000e-004	0.0000	3.7000e-004	0.0000	3.7000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3117	0.3117	1.0000e-005	0.0000	0.3119
Total	**1.2000e-004**	**7.0000e-005**	**8.4000e-004**	**0.0000**	**3.7000e-004**	**0.0000**	**3.7000e-004**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3117**	**0.3117**	**1.0000e-005**	**0.0000**	**0.3119**

3.6 Deep Water Removal - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	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 Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 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	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	1.2000e-004	7.0000e-005	8.4000e-004	0.0000	3.7000e-004	0.0000	3.7000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3117	0.3117	1.0000e-005	0.0000	0.3119
Total	**1.2000e-004**	**7.0000e-005**	**8.4000e-004**	**0.0000**	**3.7000e-004**	**0.0000**	**3.7000e-004**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3117**	**0.3117**	**1.0000e-005**	**0.0000**	**0.3119**

3.7 Offloading/Stablization/Dewatering - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0000e-004	0.0000	1.0000e-004	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0703	0.5572	0.7024	1.6600e-003		0.0257	0.0257		0.0237	0.0237	0.0000	145.5821	145.5821	0.0471	0.0000	146.7592
Total	**0.0703**	**0.5572**	**0.7024**	**1.6600e-003**	**1.0000e-004**	**0.0257**	**0.0258**	**1.0000e-005**	**0.0237**	**0.0237**	**0.0000**	**145.5821**	**145.5821**	**0.0471**	**0.0000**	**146.7592**

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	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	3.0000e-004	1.8000e-004	2.1500e-003	1.0000e-005	9.4000e-004	1.0000e-005	9.5000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.7977	0.7977	1.0000e-005	0.0000	0.7981
Total	**3.0000e-004**	**1.8000e-004**	**2.1500e-003**	**1.0000e-005**	**9.4000e-004**	**1.0000e-005**	**9.5000e-004**	**2.5000e-004**	**1.0000e-005**	**2.6000e-004**	**0.0000**	**0.7977**	**0.7977**	**1.0000e-005**	**0.0000**	**0.7981**

3.7 Offloading/Stablization/Dewatering - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0000e-004	0.0000	1.0000e-004	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0703	0.5572	0.7024	1.6600e-003		0.0257	0.0257		0.0237	0.0237	0.0000	145.5820	145.5820	0.0471	0.0000	146.7591
Total	**0.0703**	**0.5572**	**0.7024**	**1.6600e-003**	**1.0000e-004**	**0.0257**	**0.0258**	**1.0000e-005**	**0.0237**	**0.0237**	**0.0000**	**145.5820**	**145.5820**	**0.0471**	**0.0000**	**146.7591**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	3.0000e-004	1.8000e-004	2.1500e-003	1.0000e-005	9.4000e-004	1.0000e-005	9.5000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.7977	0.7977	1.0000e-005	0.0000	0.7981
Total	**3.0000e-004**	**1.8000e-004**	**2.1500e-003**	**1.0000e-005**	**9.4000e-004**	**1.0000e-005**	**9.5000e-004**	**2.5000e-004**	**1.0000e-005**	**2.6000e-004**	**0.0000**	**0.7977**	**0.7977**	**1.0000e-005**	**0.0000**	**0.7981**

3.8 Transportation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.1700e-003	0.0000	2.1700e-003	3.3000e-004	0.0000	3.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	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**	**2.1700e-003**	**0.0000**	**2.1700e-003**	**3.3000e-004**	**0.0000**	**3.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	0.0115	0.3990	0.2462	1.8100e-003	0.0425	1.0100e-003	0.0435	0.0117	9.7000e-004	0.0126	0.0000	197.4337	197.4337	0.0381	0.0000	198.3857
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	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	**0.0115**	**0.3990**	**0.2462**	**1.8100e-003**	**0.0425**	**1.0100e-003**	**0.0435**	**0.0117**	**9.7000e-004**	**0.0126**	**0.0000**	**197.4337**	**197.4337**	**0.0381**	**0.0000**	**198.3857**

3.8 Transportation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.1700e-003	0.0000	2.1700e-003	3.3000e-004	0.0000	3.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	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**	**2.1700e-003**	**0.0000**	**2.1700e-003**	**3.3000e-004**	**0.0000**	**3.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0115	0.3990	0.2462	1.8100e-003	0.0425	1.0100e-003	0.0435	0.0117	9.7000e-004	0.0126	0.0000	197.4337	197.4337	0.0381	0.0000	198.3857
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	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	**0.0115**	**0.3990**	**0.2462**	**1.8100e-003**	**0.0425**	**1.0100e-003**	**0.0435**	**0.0117**	**9.7000e-004**	**0.0126**	**0.0000**	**197.4337**	**197.4337**	**0.0381**	**0.0000**	**198.3857**

3.9 Cap/Armouring - hand - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.1000e-004	0.0000	7.1000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.8100e-003	0.0285	0.0414	6.0000e-005		1.4100e-003	1.4100e-003		1.2900e-003	1.2900e-003	0.0000	5.0784	5.0784	1.6400e-003	0.0000	5.1195
Total	**2.8100e-003**	**0.0285**	**0.0414**	**6.0000e-005**	**7.1000e-004**	**1.4100e-003**	**2.1200e-003**	**1.1000e-004**	**1.2900e-003**	**1.4000e-003**	**0.0000**	**5.0784**	**5.0784**	**1.6400e-003**	**0.0000**	**5.1195**

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	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	2.5000e-004	1.5000e-004	1.7900e-003	1.0000e-005	7.8000e-004	1.0000e-005	7.9000e-004	2.1000e-004	1.0000e-005	2.1000e-004	0.0000	0.6637	0.6637	1.0000e-005	0.0000	0.6640
Total	**2.5000e-004**	**1.5000e-004**	**1.7900e-003**	**1.0000e-005**	**7.8000e-004**	**1.0000e-005**	**7.9000e-004**	**2.1000e-004**	**1.0000e-005**	**2.1000e-004**	**0.0000**	**0.6637**	**0.6637**	**1.0000e-005**	**0.0000**	**0.6640**

3.9 Cap/Armouring - hand - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.1000e-004	0.0000	7.1000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.8100e-003	0.0285	0.0414	6.0000e-005		1.4100e-003	1.4100e-003		1.2900e-003	1.2900e-003	0.0000	5.0784	5.0784	1.6400e-003	0.0000	5.1195
Total	**2.8100e-003**	**0.0285**	**0.0414**	**6.0000e-005**	**7.1000e-004**	**1.4100e-003**	**2.1200e-003**	**1.1000e-004**	**1.2900e-003**	**1.4000e-003**	**0.0000**	**5.0784**	**5.0784**	**1.6400e-003**	**0.0000**	**5.1195**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	2.5000e-004	1.5000e-004	1.7900e-003	1.0000e-005	7.8000e-004	1.0000e-005	7.9000e-004	2.1000e-004	1.0000e-005	2.1000e-004	0.0000	0.6637	0.6637	1.0000e-005	0.0000	0.6640
Total	**2.5000e-004**	**1.5000e-004**	**1.7900e-003**	**1.0000e-005**	**7.8000e-004**	**1.0000e-005**	**7.9000e-004**	**2.1000e-004**	**1.0000e-005**	**2.1000e-004**	**0.0000**	**0.6637**	**0.6637**	**1.0000e-005**	**0.0000**	**0.6640**

3.10 Backfilling - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.6800e-003	0.0000	2.6800e-003	4.1000e-004	0.0000	4.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	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**	**2.6800e-003**	**0.0000**	**2.6800e-003**	**4.1000e-004**	**0.0000**	**4.1000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	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	4.0000e-005	2.0000e-005	3.0000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	3.0000e-005	0.0000	4.0000e-005	0.0000	0.1106	0.1106	0.0000	0.0000	0.1107
Total	**4.0000e-005**	**2.0000e-005**	**3.0000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**3.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1106**	**0.1106**	**0.0000**	**0.0000**	**0.1107**

3.10 Backfilling - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.6800e-003	0.0000	2.6800e-003	4.1000e-004	0.0000	4.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	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**	**2.6800e-003**	**0.0000**	**2.6800e-003**	**4.1000e-004**	**0.0000**	**4.1000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	4.0000e-005	2.0000e-005	3.0000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	3.0000e-005	0.0000	4.0000e-005	0.0000	0.1106	0.1106	0.0000	0.0000	0.1107
Total	**4.0000e-005**	**2.0000e-005**	**3.0000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**3.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**0.1106**	**0.1106**	**0.0000**	**0.0000**	**0.1107**

3.11 Cap/Armouring - mechanical - 2023

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
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
Worker					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**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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
Worker					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**

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

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	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

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	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**	**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

	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**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					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**

7.2 Water by Land Use

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Pier 39-43.5 - Area E

San Francisco County, 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	4.39	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2031
Utility Company	City and County of San Francisco				
CO2 Intensity (lb/MWhr)	76.28	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Trips and VMT - proj specific

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Parking	150	0
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	150	0
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	100	0
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	150	0
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	100	0
tblConstructionPhase	NumDays	8.00	1.00

tblConstructionPhase	NumDays	8.00	3.00
tblConstructionPhase	NumDays	5.00	214.00
tblConstructionPhase	NumDays	5.00	214.00
tblConstructionPhase	NumDays	5.00	198.00
tblConstructionPhase	NumDays	5.00	191.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblFleetMix	HHD	9.7460e-003	0.00
tblFleetMix	LDA	0.60	0.00
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT2	0.19	0.00
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD2	5.2920e-003	0.00
tblFleetMix	MCY	5.7080e-003	0.00
tblFleetMix	MDV	0.09	0.00
tblFleetMix	MH	6.0600e-004	0.00
tblFleetMix	MHD	0.04	0.00
tblFleetMix	OBUS	4.2980e-003	0.00
tblFleetMix	SBUS	9.5800e-004	0.00

tblFleetMix	UBUS	2.3000e-003	0.00
tblGrading	MaterialExported	0.00	25,680.00
tblGrading	MaterialImported	0.00	144.00
tblGrading	MaterialImported	0.00	2,092.00
tblGrading	MaterialImported	0.00	1,189.00
tblLandUse	LotAcreage	0.00	4.39
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	UsageHours	8.00	9.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblTripsAndVMT	HaulingTripLength	20.00	100.00
tblTripsAndVMT	HaulingTripNumber	207.00	934.00
tblTripsAndVMT	HaulingTripNumber	118.00	0.00

tblTripsAndVMT	HaulingTripNumber	2,539.00	1,402.00
tblTripsAndVMT	HaulingTripNumber	14.00	0.00
tblTripsAndVMT	WorkerTripNumber	8.00	1.00
tblTripsAndVMT	WorkerTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	3.00	4.00
tblTripsAndVMT	WorkerTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	18.00	1.00
tblTripsAndVMT	WorkerTripNumber	0.00	22.00
tblTripsAndVMT	WorkerTripNumber	3.00	6.00

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					
2028	0.1288	1.2973	1.8320	5.1000e-003	0.0703	0.0389	0.1093	0.0186	0.0359	0.0544	0.0000	500.6860	500.6860	0.1365	0.0000	504.0976
2029	0.0303	0.2834	0.3857	1.1800e-003	0.0508	8.7000e-003	0.0595	0.0125	8.0100e-003	0.0206	0.0000	116.1218	116.1218	0.0321	0.0000	116.9250
Maximum	**0.1288**	**1.2973**	**1.8320**	**5.1000e-003**	**0.0703**	**0.0389**	**0.1093**	**0.0186**	**0.0359**	**0.0544**	**0.0000**	**500.6860**	**500.6860**	**0.1365**	**0.0000**	**504.0976**

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					
2028	0.1288	1.2973	1.8320	5.1000e-003	0.0703	0.0389	0.1093	0.0186	0.0359	0.0544	0.0000	500.6857	500.6857	0.1365	0.0000	504.0973
2029	0.0303	0.2834	0.3857	1.1800e-003	0.0508	8.7000e-003	0.0595	0.0125	8.0100e-003	0.0206	0.0000	116.1217	116.1217	0.0321	0.0000	116.9249
Maximum	**0.1288**	**1.2973**	**1.8320**	**5.1000e-003**	**0.0703**	**0.0389**	**0.1093**	**0.0186**	**0.0359**	**0.0544**	**0.0000**	**500.6857**	**500.6857**	**0.1365**	**0.0000**	**504.0973**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	3-6-2028	6-5-2028	0.1390	0.1390
2	6-6-2028	9-5-2028	0.4835	0.4835
3	9-6-2028	12-5-2028	0.6413	0.6413
4	12-6-2028	3-5-2029	0.4650	0.4650
		Highest	0.6413	0.6413

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**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	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**	**N20**	**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	Mobolization/Site Prep - Year 1	Site Preparation	3/6/2028	11/9/2028	6	214	
2	Monitoring - Year 1	Site Preparation	4/1/2028	12/6/2028	6	214	
3	Sediment and Debris Removal - Year 1	Trenching	6/5/2028	6/6/2028	6	2	
4	Shallow Water Removal - Year 1	Trenching	6/5/2028	6/4/2028	6	0	
5	Deep Water Removal - Year 1	Trenching	6/5/2028	1/11/2029	6	190	
6	Offloading/Stabilization/Dewatering - Year 1	Site Preparation	7/10/2028	2/24/2029	6	198	
7	Transportation - Year 1	Site Preparation	7/10/2028	2/16/2029	6	191	
8	Cap/Armouring - mechanical - Year 1	Grading	7/10/2028	7/10/2028	6	1	
9	Cap/Armouring - hand - Year 1	Grading	7/10/2028	7/12/2028	6	3	
10	Backfilling - Year 1	Trenching	7/10/2028	8/15/2028	6	32	

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; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobolization/Site Prep - Year 1	Concrete/Industrial Saws	0	0.00	81	0.73
Mobolization/Site Prep - Year 1	Excavators	1	5.00	158	0.38
Mobolization/Site Prep - Year 1	Rubber Tired Dozers	0	8.00	247	0.40
Mobolization/Site Prep - Year 1	Tractors/Loaders/Backhoes	2	5.00	97	0.37
Monitoring - Year 1	Rubber Tired Dozers	0	8.00	247	0.40
Monitoring - Year 1	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Sediment and Debris Removal - Year 1	Excavators	1	9.00	158	0.38
Sediment and Debris Removal - Year 1	Graders	0	8.00	187	0.41
Sediment and Debris Removal - Year 1	Rubber Tired Dozers	0	8.00	247	0.40
Sediment and Debris Removal - Year 1	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Shallow Water Removal - Year 1	Cranes	0	7.00	231	0.29
Shallow Water Removal - Year 1	Forklifts	0	8.00	89	0.20
Shallow Water Removal - Year 1	Generator Sets	0	8.00	84	0.74
Shallow Water Removal - Year 1	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Shallow Water Removal - Year 1	Welders	0	8.00	46	0.45
Deep Water Removal - Year 1	Cement and Mortar Mixers	0	6.00	9	0.56
Deep Water Removal - Year 1	Pavers	0	8.00	130	0.42
Deep Water Removal - Year 1	Paving Equipment	0	6.00	132	0.36
Deep Water Removal - Year 1	Rollers	0	6.00	80	0.38
Deep Water Removal - Year 1	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Backfilling - Year 1	Air Compressors	0	6.00	78	0.48
Cap/Armouring - mechanical - Year 1	Excavators	0	8.00	158	0.38
Cap/Armouring - mechanical - Year 1	Graders	0	8.00	187	0.41
Cap/Armouring - mechanical - Year 1	Rubber Tired Dozers	0	8.00	247	0.40
Cap/Armouring - mechanical - Year 1	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Cap/Armouring - hand - Year 1	Excavators	0	8.00	158	0.38
Cap/Armouring - hand - Year 1	Graders	0	8.00	187	0.41
Cap/Armouring - hand - Year 1	Rubber Tired Dozers	0	8.00	247	0.40
Cap/Armouring - hand - Year 1	Tractors/Loaders/Backhoes	1	9.00	97	0.37
Offloading/Stabilization/Dewatering - Year 1	Excavators	1	5.00	158	0.38
Offloading/Stabilization/Dewatering - Year 1	Forklifts	1	5.00	89	0.20
Offloading/Stabilization/Dewatering - Year 1	Off-Highway Trucks	2	5.00	402	0.38

Offloading/Stabilization/Dewatering - Year 1	Other Material Handling Equipment	1	5.00	168	0.40
Offloading/Stabilization/Dewatering - Year 1	Rubber Tired Dozers	0	8.00	247	0.40
Offloading/Stabilization/Dewatering - Year 1	Sweepers/Scrubbers	1	5.00	64	0.46
Offloading/Stabilization/Dewatering - Year 1	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Transportation - Year 1	Rubber Tired Dozers	0	8.00	247	0.40
Transportation - Year 1	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobolization/Site Prep - Year 1	3	1.00	0.00	934.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Monitoring - Year 1	0	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Sediment and Debris Removal - Year 1	1	4.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Shallow Water Removal - Year 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Deep Water Removal - Year 1	0	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Backfilling - Year 1	0	2.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Cap/Armouring - mechanical - Year 1	0	22.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Cap/Armouring - hand - Year 1	1	6.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Offloading/Stabilization/Dewatering - Year 1	7	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Transportation - Year 1	0	0.00	0.00	1,402.00	10.80	7.30	100.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Mobolization/Site Prep - Year 1 - 2028

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					2.4000e-004	0.0000	2.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0289	0.2603	0.5162	7.6000e-004		0.0112	0.0112		0.0103	0.0103	0.0000	67.0047	67.0047	0.0217	0.0000	67.5465
Total	**0.0289**	**0.2603**	**0.5162**	**7.6000e-004**	**2.4000e-004**	**0.0112**	**0.0115**	**4.0000e-005**	**0.0103**	**0.0104**	**0.0000**	**67.0047**	**67.0047**	**0.0217**	**0.0000**	**67.5465**

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	2.3600e-003	0.0846	0.0581	3.3000e-004	7.8400e-003	1.7000e-004	8.0000e-003	2.1500e-003	1.6000e-004	2.3100e-003	0.0000	36.6944	36.6944	7.9500e-003	0.0000	36.8932
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	2.2000e-004	1.1000e-004	1.4200e-003	1.0000e-005	8.5000e-004	1.0000e-005	8.5000e-004	2.2000e-004	0.0000	2.3000e-004	0.0000	0.5961	0.5961	1.0000e-005	0.0000	0.5963
Total	**2.5800e-003**	**0.0847**	**0.0595**	**3.4000e-004**	**8.6900e-003**	**1.8000e-004**	**8.8500e-003**	**2.3700e-003**	**1.6000e-004**	**2.5400e-003**	**0.0000**	**37.2905**	**37.2905**	**7.9600e-003**	**0.0000**	**37.4896**

3.2 Mobolization/Site Prep - Year 1 - 2028

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					2.4000e-004	0.0000	2.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0289	0.2603	0.5162	7.6000e-004		0.0112	0.0112		0.0103	0.0103	0.0000	67.0047	67.0047	0.0217	0.0000	67.5464
Total	**0.0289**	**0.2603**	**0.5162**	**7.6000e-004**	**2.4000e-004**	**0.0112**	**0.0115**	**4.0000e-005**	**0.0103**	**0.0104**	**0.0000**	**67.0047**	**67.0047**	**0.0217**	**0.0000**	**67.5464**

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	2.3600e-003	0.0846	0.0581	3.3000e-004	7.8400e-003	1.7000e-004	8.0000e-003	2.1500e-003	1.6000e-004	2.3100e-003	0.0000	36.6944	36.6944	7.9500e-003	0.0000	36.8932
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	2.2000e-004	1.1000e-004	1.4200e-003	1.0000e-005	8.5000e-004	1.0000e-005	8.5000e-004	2.2000e-004	0.0000	2.3000e-004	0.0000	0.5961	0.5961	1.0000e-005	0.0000	0.5963
Total	**2.5800e-003**	**0.0847**	**0.0595**	**3.4000e-004**	**8.6900e-003**	**1.8000e-004**	**8.8500e-003**	**2.3700e-003**	**1.6000e-004**	**2.5400e-003**	**0.0000**	**37.2905**	**37.2905**	**7.9600e-003**	**0.0000**	**37.4896**

3.3 Monitoring - Year 1 - 2028

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	0.0000	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**	**0.0000**	**0.0000**

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	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	2.2000e-004	1.1000e-004	1.4200e-003	1.0000e-005	8.5000e-004	1.0000e-005	8.5000e-004	2.2000e-004	0.0000	2.3000e-004	0.0000	0.5961	0.5961	1.0000e-005	0.0000	0.5963
Total	**2.2000e-004**	**1.1000e-004**	**1.4200e-003**	**1.0000e-005**	**8.5000e-004**	**1.0000e-005**	**8.5000e-004**	**2.2000e-004**	**0.0000**	**2.3000e-004**	**0.0000**	**0.5961**	**0.5961**	**1.0000e-005**	**0.0000**	**0.5963**

3.3 Monitoring - Year 1 - 2028

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	0.0000	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**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	2.2000e-004	1.1000e-004	1.4200e-003	1.0000e-005	8.5000e-004	1.0000e-005	8.5000e-004	2.2000e-004	0.0000	2.3000e-004	0.0000	0.5961	0.5961	1.0000e-005	0.0000	0.5963
Total	**2.2000e-004**	**1.1000e-004**	**1.4200e-003**	**1.0000e-005**	**8.5000e-004**	**1.0000e-005**	**8.5000e-004**	**2.2000e-004**	**0.0000**	**2.3000e-004**	**0.0000**	**0.5961**	**0.5961**	**1.0000e-005**	**0.0000**	**0.5963**

3.4 Sediment and Debris Removal - Year 1 - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.9000e-004	1.3700e-003	3.6700e-003	1.0000e-005		7.0000e-005	7.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.5106	0.5106	1.7000e-004	0.0000	0.5148
Total	**1.9000e-004**	**1.3700e-003**	**3.6700e-003**	**1.0000e-005**		**7.0000e-005**	**7.0000e-005**		**6.0000e-005**	**6.0000e-005**	**0.0000**	**0.5106**	**0.5106**	**1.7000e-004**	**0.0000**	**0.5148**

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	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	1.0000e-005	0.0000	5.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0223	0.0223	0.0000	0.0000	0.0223
Total	**1.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0223**	**0.0223**	**0.0000**	**0.0000**	**0.0223**

3.4 Sediment and Debris Removal - Year 1 - 2028

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.9000e-004	1.3700e-003	3.6700e-003	1.0000e-005		7.0000e-005	7.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.5106	0.5106	1.7000e-004	0.0000	0.5148
Total	**1.9000e-004**	**1.3700e-003**	**3.6700e-003**	**1.0000e-005**		**7.0000e-005**	**7.0000e-005**		**6.0000e-005**	**6.0000e-005**	**0.0000**	**0.5106**	**0.5106**	**1.7000e-004**	**0.0000**	**0.5148**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	1.0000e-005	0.0000	5.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0223	0.0223	0.0000	0.0000	0.0223
Total	**1.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0223**	**0.0223**	**0.0000**	**0.0000**	**0.0223**

3.5 Shallow Water Removal - Year 1 - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	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**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	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	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**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.5 Shallow Water Removal - Year 1 - 2028

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	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**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	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**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.6 Deep Water Removal - Year 1 - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	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**

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	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	1.8000e-004	9.0000e-005	1.2000e-003	1.0000e-005	7.1000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.5014	0.5014	1.0000e-005	0.0000	0.5016
Total	**1.8000e-004**	**9.0000e-005**	**1.2000e-003**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**7.2000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.5014**	**0.5014**	**1.0000e-005**	**0.0000**	**0.5016**

3.6 Deep Water Removal - Year 1 - 2028

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	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 Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 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	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	1.8000e-004	9.0000e-005	1.2000e-003	1.0000e-005	7.1000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.5014	0.5014	1.0000e-005	0.0000	0.5016
Total	**1.8000e-004**	**9.0000e-005**	**1.2000e-003**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**7.2000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.5014**	**0.5014**	**1.0000e-005**	**0.0000**	**0.5016**

3.6 Deep Water Removal - Year 1 - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	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**

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	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	1.0000e-005	0.0000	6.0000e-005	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0271	0.0271	0.0000	0.0000	0.0271
Total	**1.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0271**	**0.0271**	**0.0000**	**0.0000**	**0.0271**

3.6 Deep Water Removal - Year 1 - 2029

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	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 Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 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	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	1.0000e-005	0.0000	6.0000e-005	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0271	0.0271	0.0000	0.0000	0.0271
Total	**1.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0271**	**0.0271**	**0.0000**	**0.0000**	**0.0271**

3.7 Offloading/Stabilization/Dewatering - Year 1 - 2028

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					1.4000e-004	0.0000	1.4000e-004	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0845	0.6106	0.9370	2.1800e-003		0.0264	0.0264		0.0243	0.0243	0.0000	191.2258	191.2258	0.0619	0.0000	192.7720
Total	**0.0845**	**0.6106**	**0.9370**	**2.1800e-003**	**1.4000e-004**	**0.0264**	**0.0266**	**2.0000e-005**	**0.0243**	**0.0243**	**0.0000**	**191.2258**	**191.2258**	**0.0619**	**0.0000**	**192.7720**

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	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	1.5000e-004	7.0000e-005	1.0000e-003	0.0000	5.9000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.4178	0.4178	1.0000e-005	0.0000	0.4180
Total	**1.5000e-004**	**7.0000e-005**	**1.0000e-003**	**0.0000**	**5.9000e-004**	**0.0000**	**6.0000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**0.4178**	**0.4178**	**1.0000e-005**	**0.0000**	**0.4180**

3.7 Offloading/Stabilization/Dewatering - Year 1 - 2028

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					1.4000e-004	0.0000	1.4000e-004	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0845	0.6106	0.9370	2.1800e-003		0.0264	0.0264		0.0243	0.0243	0.0000	191.2256	191.2256	0.0619	0.0000	192.7718
Total	**0.0845**	**0.6106**	**0.9370**	**2.1800e-003**	**1.4000e-004**	**0.0264**	**0.0266**	**2.0000e-005**	**0.0243**	**0.0243**	**0.0000**	**191.2256**	**191.2256**	**0.0619**	**0.0000**	**192.7718**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	1.5000e-004	7.0000e-005	1.0000e-003	0.0000	5.9000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.4178	0.4178	1.0000e-005	0.0000	0.4180
Total	**1.5000e-004**	**7.0000e-005**	**1.0000e-003**	**0.0000**	**5.9000e-004**	**0.0000**	**6.0000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**0.4178**	**0.4178**	**1.0000e-005**	**0.0000**	**0.4180**

3.7 Offloading/Stabilization/Dewatering - Year 1 - 2029

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					1.4000e-004	0.0000	1.4000e-004	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0270	0.1954	0.2998	7.0000e-004		8.4600e-003	8.4600e-003		7.7800e-003	7.7800e-003	0.0000	61.1923	61.1923	0.0198	0.0000	61.6870
Total	**0.0270**	**0.1954**	**0.2998**	**7.0000e-004**	**1.4000e-004**	**8.4600e-003**	**8.6000e-003**	**2.0000e-005**	**7.7800e-003**	**7.8000e-003**	**0.0000**	**61.1923**	**61.1923**	**0.0198**	**0.0000**	**61.6870**

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	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	5.0000e-005	2.0000e-005	3.0000e-004	0.0000	1.9000e-004	0.0000	1.9000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1301	0.1301	0.0000	0.0000	0.1301
Total	**5.0000e-005**	**2.0000e-005**	**3.0000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.1301**	**0.1301**	**0.0000**	**0.0000**	**0.1301**

3.7 Offloading/Stabilization/Dewatering - Year 1 - 2029

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					1.4000e-004	0.0000	1.4000e-004	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0270	0.1954	0.2998	7.0000e-004		8.4600e-003	8.4600e-003		7.7800e-003	7.7800e-003	0.0000	61.1922	61.1922	0.0198	0.0000	61.6870
Total	**0.0270**	**0.1954**	**0.2998**	**7.0000e-004**	**1.4000e-004**	**8.4600e-003**	**8.6000e-003**	**2.0000e-005**	**7.7800e-003**	**7.8000e-003**	**0.0000**	**61.1922**	**61.1922**	**0.0198**	**0.0000**	**61.6870**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	5.0000e-005	2.0000e-005	3.0000e-004	0.0000	1.9000e-004	0.0000	1.9000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1301	0.1301	0.0000	0.0000	0.1301
Total	**5.0000e-005**	**2.0000e-005**	**3.0000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.1301**	**0.1301**	**0.0000**	**0.0000**	**0.1301**

3.8 Transportation - Year 1 - 2028

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					3.0000e-003	0.0000	3.0000e-003	4.5000e-004	0.0000	4.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	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**	**3.0000e-003**	**0.0000**	**3.0000e-003**	**4.5000e-004**	**0.0000**	**4.5000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	0.0118	0.3378	0.3075	1.7900e-003	0.0557	9.1000e-004	0.0566	0.0150	8.7000e-004	0.0159	0.0000	202.3645	202.3645	0.0446	0.0000	203.4806
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	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	**0.0118**	**0.3378**	**0.3075**	**1.7900e-003**	**0.0557**	**9.1000e-004**	**0.0566**	**0.0150**	**8.7000e-004**	**0.0159**	**0.0000**	**202.3645**	**202.3645**	**0.0446**	**0.0000**	**203.4806**

3.8 Transportation - Year 1 - 2028

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					3.0000e-003	0.0000	3.0000e-003	4.5000e-004	0.0000	4.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	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**	**3.0000e-003**	**0.0000**	**3.0000e-003**	**4.5000e-004**	**0.0000**	**4.5000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0118	0.3378	0.3075	1.7900e-003	0.0557	9.1000e-004	0.0566	0.0150	8.7000e-004	0.0159	0.0000	202.3645	202.3645	0.0446	0.0000	203.4806
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	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	**0.0118**	**0.3378**	**0.3075**	**1.7900e-003**	**0.0557**	**9.1000e-004**	**0.0566**	**0.0150**	**8.7000e-004**	**0.0159**	**0.0000**	**202.3645**	**202.3645**	**0.0446**	**0.0000**	**203.4806**

3.8 Transportation - Year 1 - 2029

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					3.0000e-003	0.0000	3.0000e-003	4.5000e-004	0.0000	4.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	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**	**3.0000e-003**	**0.0000**	**3.0000e-003**	**4.5000e-004**	**0.0000**	**4.5000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	3.1900e-003	0.0879	0.0855	4.8000e-004	0.0474	2.4000e-004	0.0477	0.0120	2.3000e-004	0.0122	0.0000	54.7724	54.7724	0.0123	0.0000	55.0808
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	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	**3.1900e-003**	**0.0879**	**0.0855**	**4.8000e-004**	**0.0474**	**2.4000e-004**	**0.0477**	**0.0120**	**2.3000e-004**	**0.0122**	**0.0000**	**54.7724**	**54.7724**	**0.0123**	**0.0000**	**55.0808**

3.8 Transportation - Year 1 - 2029

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					3.0000e-003	0.0000	3.0000e-003	4.5000e-004	0.0000	4.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	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**	**3.0000e-003**	**0.0000**	**3.0000e-003**	**4.5000e-004**	**0.0000**	**4.5000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	3.1900e-003	0.0879	0.0855	4.8000e-004	0.0474	2.4000e-004	0.0477	0.0120	2.3000e-004	0.0122	0.0000	54.7724	54.7724	0.0123	0.0000	55.0808
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	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	**3.1900e-003**	**0.0879**	**0.0855**	**4.8000e-004**	**0.0474**	**2.4000e-004**	**0.0477**	**0.0120**	**2.3000e-004**	**0.0122**	**0.0000**	**54.7724**	**54.7724**	**0.0123**	**0.0000**	**55.0808**

3.9 Cap/Armouring - mechanical - Year 1 - 2028

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					2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	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**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	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	2.0000e-005	1.0000e-005	1.5000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0613	0.0613	0.0000	0.0000	0.0613
Total	**2.0000e-005**	**1.0000e-005**	**1.5000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0613**	**0.0613**	**0.0000**	**0.0000**	**0.0613**

3.9 Cap/Armouring - mechanical - Year 1 - 2028

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					2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	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**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	2.0000e-005	1.0000e-005	1.5000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0613	0.0613	0.0000	0.0000	0.0613
Total	**2.0000e-005**	**1.0000e-005**	**1.5000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0613**	**0.0613**	**0.0000**	**0.0000**	**0.0613**

3.10 Cap/Armouring - hand - Year 1 - 2028

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	2.2000e-004	2.2500e-003	3.7600e-003	1.0000e-005		9.0000e-005	9.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.4624	0.4624	1.5000e-004	0.0000	0.4662
Total	**2.2000e-004**	**2.2500e-003**	**3.7600e-003**	**1.0000e-005**	**0.0000**	**9.0000e-005**	**9.0000e-005**	**0.0000**	**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.4624**	**0.4624**	**1.5000e-004**	**0.0000**	**0.4662**

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	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	2.0000e-005	1.0000e-005	1.2000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0501	0.0501	0.0000	0.0000	0.0502
Total	**2.0000e-005**	**1.0000e-005**	**1.2000e-004**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0501**	**0.0501**	**0.0000**	**0.0000**	**0.0502**

3.10 Cap/Armouring - hand - Year 1 - 2028

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	2.2000e-004	2.2500e-003	3.7600e-003	1.0000e-005		9.0000e-005	9.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.4624	0.4624	1.5000e-004	0.0000	0.4662
Total	**2.2000e-004**	**2.2500e-003**	**3.7600e-003**	**1.0000e-005**	**0.0000**	**9.0000e-005**	**9.0000e-005**	**0.0000**	**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.4624**	**0.4624**	**1.5000e-004**	**0.0000**	**0.4662**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	2.0000e-005	1.0000e-005	1.2000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0501	0.0501	0.0000	0.0000	0.0502
Total	**2.0000e-005**	**1.0000e-005**	**1.2000e-004**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0501**	**0.0501**	**0.0000**	**0.0000**	**0.0502**

3.11 Backfilling - Year 1 - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	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**

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	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	6.0000e-005	3.0000e-005	4.3000e-004	0.0000	2.5000e-004	0.0000	2.5000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.1783	0.1783	0.0000	0.0000	0.1783
Total	**6.0000e-005**	**3.0000e-005**	**4.3000e-004**	**0.0000**	**2.5000e-004**	**0.0000**	**2.5000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.1783**	**0.1783**	**0.0000**	**0.0000**	**0.1783**

3.11 Backfilling - Year 1 - 2028

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	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 Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 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	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	6.0000e-005	3.0000e-005	4.3000e-004	0.0000	2.5000e-004	0.0000	2.5000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.1783	0.1783	0.0000	0.0000	0.1783
Total	**6.0000e-005**	**3.0000e-005**	**4.3000e-004**	**0.0000**	**2.5000e-004**	**0.0000**	**2.5000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.1783**	**0.1783**	**0.0000**	**0.0000**	**0.1783**

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

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	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

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	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**	**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

	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**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					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**

7.2 Water by Land Use

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Pier 39-43.5 - Area E

San Francisco County, 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	4.39	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2031
Utility Company	City and County of San Francisco				
CO2 Intensity (lb/MWhr)	76.28	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Trips and VMT - proj specific

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Parking	150	0
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	150	0
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	100	0
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	150	0
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	100	0
tblConstructionPhase	NumDays	8.00	3.00

tblConstructionPhase	NumDays	8.00	32.00
tblConstructionPhase	NumDays	8.00	1.00
tblConstructionPhase	NumDays	5.00	214.00
tblConstructionPhase	NumDays	5.00	214.00
tblConstructionPhase	NumDays	5.00	198.00
tblConstructionPhase	NumDays	5.00	191.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblFleetMix	HHD	9.7460e-003	0.00
tblFleetMix	LDA	0.60	0.00
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT2	0.19	0.00
tblFleetMix	LHD1	0.01	0.00
tblFleetMix	LHD2	5.2920e-003	0.00
tblFleetMix	MCY	5.7080e-003	0.00
tblFleetMix	MDV	0.09	0.00
tblFleetMix	MH	6.0600e-004	0.00
tblFleetMix	MHD	0.04	0.00
tblFleetMix	OBUS	4.2980e-003	0.00

tblFleetMix	SBUS	9.5800e-004	0.00
tblFleetMix	UBUS	2.3000e-003	0.00
tblGrading	MaterialExported	0.00	25,860.00
tblGrading	MaterialImported	0.00	144.00
tblGrading	MaterialImported	0.00	2,092.00
tblGrading	MaterialImported	0.00	1,189.00
tblLandUse	LotAcreage	0.00	4.39
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00

tblOffRoadEquipment	UsageHours	8.00	9.00
tblOffRoadEquipment	UsageHours	8.00	5.00
tblTripsAndVMT	HaulingTripLength	20.00	100.00
tblTripsAndVMT	HaulingTripNumber	207.00	934.00
tblTripsAndVMT	HaulingTripNumber	118.00	0.00
tblTripsAndVMT	HaulingTripNumber	2,557.00	1,402.00
tblTripsAndVMT	HaulingTripNumber	14.00	0.00
tblTripsAndVMT	WorkerTripNumber	8.00	1.00
tblTripsAndVMT	WorkerTripNumber	3.00	6.00
tblTripsAndVMT	WorkerTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	3.00	4.00
tblTripsAndVMT	WorkerTripNumber	18.00	1.00
tblTripsAndVMT	WorkerTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	0.00	22.00

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					
2029	0.1291	1.2840	1.8453	5.0900e-003	0.0697	0.0391	0.1088	0.0184	0.0360	0.0544	0.0000	500.4038	500.4038	0.1377	0.0000	503.8467
2030	0.0347	0.1807	0.3837	1.2200e-003	0.0507	3.1300e-003	0.0538	0.0125	3.1200e-003	0.0156	0.0000	124.8531	124.8531	0.0147	0.0000	125.2198
Maximum	**0.1291**	**1.2840**	**1.8453**	**5.0900e-003**	**0.0697**	**0.0391**	**0.1088**	**0.0184**	**0.0360**	**0.0544**	**0.0000**	**500.4038**	**500.4038**	**0.1377**	**0.0000**	**503.8467**

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					
2029	0.1291	1.2840	1.8453	5.0900e-003	0.0697	0.0391	0.1088	0.0184	0.0360	0.0544	0.0000	500.4035	500.4035	0.1377	0.0000	503.8464
2030	0.0347	0.1807	0.3837	1.2200e-003	0.0507	3.1300e-003	0.0538	0.0125	3.1200e-003	0.0156	0.0000	124.8530	124.8530	0.0147	0.0000	125.2197
Maximum	**0.1291**	**1.2840**	**1.8453**	**5.0900e-003**	**0.0697**	**0.0391**	**0.1088**	**0.0184**	**0.0360**	**0.0544**	**0.0000**	**500.4035**	**500.4035**	**0.1377**	**0.0000**	**503.8464**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	3-6-2029	6-5-2029	0.1385	0.1385
2	6-6-2029	9-5-2029	0.4821	0.4821
3	9-6-2029	12-5-2029	0.6303	0.6303
4	12-6-2029	3-5-2030	0.3666	0.3666
		Highest	0.6303	0.6303

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**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	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**	**N20**	**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	Mobolization/Site Prep - Year 2	Site Preparation	3/5/2029	11/8/2029	6	214	
2	Monitoring - Year 2	Site Preparation	4/2/2029	12/6/2029	6	214	
3	Sediment and Debris Removal - Year 2	Trenching	6/4/2029	6/5/2029	6	2	
4	Shallow Water Removal - Year 2	Trenching	6/4/2029	6/3/2029	6	0	
5	Deep Water Removal - Year 2	Trenching	6/4/2029	1/10/2030	6	190	
6	Offloading/Stablization/Dewatering - Year 2	Site Preparation	7/9/2029	2/23/2030	6	198	
7	Transportation - Year 2	Site Preparation	7/9/2029	2/15/2030	6	191	
8	Backfilling - Year 2	Grading	7/9/2029	8/14/2029	6	32	
9	Cap/Armouring - mechanical - Year 2	Grading	7/9/2029	7/9/2029	6	1	
10	Cap/Armouring - hand - Year 2	Grading	7/9/2029	7/11/2029	6	3	

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; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobolization/Site Prep - Year 2	Excavators	1	5.00	158	0.38
Mobolization/Site Prep - Year 2	Rubber Tired Dozers	0	8.00	247	0.40
Mobolization/Site Prep - Year 2	Tractors/Loaders/Backhoes	2	5.00	97	0.37
Monitoring - Year 2	Rubber Tired Dozers	0	8.00	247	0.40
Monitoring - Year 2	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Sediment and Debris Removal - Year 2	Excavators	1	9.00	158	0.38

Backfilling - Year 2	Excavators	0	8.00	158	0.38
Backfilling - Year 2	Graders	0	8.00	187	0.41
Backfilling - Year 2	Rubber Tired Dozers	0	8.00	247	0.40
Backfilling - Year 2	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Cap/Armouring - mechanical - Year 2	Excavators	0	8.00	158	0.38
Cap/Armouring - mechanical - Year 2	Graders	0	8.00	187	0.41
Cap/Armouring - mechanical - Year 2	Rubber Tired Dozers	0	8.00	247	0.40
Cap/Armouring - mechanical - Year 2	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Cap/Armouring - hand - Year 2	Excavators	0	8.00	158	0.38
Cap/Armouring - hand - Year 2	Graders	0	8.00	187	0.41
Cap/Armouring - hand - Year 2	Rubber Tired Dozers	0	8.00	247	0.40
Cap/Armouring - hand - Year 2	Tractors/Loaders/Backhoes	1	9.00	97	0.37
Offloading/Stablization/Dewatering - Year 2	Excavators	1	5.00	158	0.38
Offloading/Stablization/Dewatering - Year 2	Forklifts	1	5.00	89	0.20
Offloading/Stablization/Dewatering - Year 2	Off-Highway Trucks	2	5.00	402	0.38
Offloading/Stablization/Dewatering - Year 2	Other Material Handling Equipment	1	5.00	168	0.40
Offloading/Stablization/Dewatering - Year 2	Rubber Tired Dozers	0	8.00	247	0.40
Offloading/Stablization/Dewatering - Year 2	Sweepers/Scrubbers	1	5.00	64	0.46
Offloading/Stablization/Dewatering - Year 2	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Transportation - Year 2	Rubber Tired Dozers	0	8.00	247	0.40
Transportation - Year 2	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobolization/Site Prep - Year 2	3	1.00	0.00	934.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Monitoring - Year 2	0	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Sediment and Debris Removal - Year 2	1	4.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Shallow Water Removal - Year 2			0.00	0.00	10.80	7.30				
Deep Water Removal - Year 2			0.00	0.00	10.80	7.30				
Backfilling - Year 2	0	2.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Cap/Armouring - mechanical - Year 2	0	22.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Cap/Armouring - hand - Year 2	1	6.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Offloading/Stablization/ Dewatering - Year 2	7	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Transportation - Year 2	0	0.00	0.00	1,402.00	10.80	7.30	100.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Mobolization/Site Prep - Year 2 - 2029

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					2.4000e-004	0.0000	2.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0289	0.2603	0.5162	7.6000e-004		0.0112	0.0112		0.0103	0.0103	0.0000	67.0047	67.0047	0.0217	0.0000	67.5465
Total	**0.0289**	**0.2603**	**0.5162**	**7.6000e-004**	**2.4000e-004**	**0.0112**	**0.0115**	**4.0000e-005**	**0.0103**	**0.0104**	**0.0000**	**67.0047**	**67.0047**	**0.0217**	**0.0000**	**67.5465**

3.2 Mobolization/Site Prep - Year 2 - 2029

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	2.3300e-003	0.0813	0.0592	3.2000e-004	7.8400e-003	1.6000e-004	8.0000e-003	2.1500e-003	1.5000e-004	2.3100e-003	0.0000	36.3304	36.3304	8.0200e-003	0.0000	36.5308
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	2.1000e-004	1.0000e-004	1.3500e-003	1.0000e-005	8.5000e-004	0.0000	8.5000e-004	2.2000e-004	0.0000	2.3000e-004	0.0000	0.5799	0.5799	1.0000e-005	0.0000	0.5801
Total	**2.5400e-003**	**0.0814**	**0.0605**	**3.3000e-004**	**8.6900e-003**	**1.6000e-004**	**8.8500e-003**	**2.3700e-003**	**1.5000e-004**	**2.5400e-003**	**0.0000**	**36.9102**	**36.9102**	**8.0300e-003**	**0.0000**	**37.1109**

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					2.4000e-004	0.0000	2.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0289	0.2603	0.5162	7.6000e-004		0.0112	0.0112		0.0103	0.0103	0.0000	67.0047	67.0047	0.0217	0.0000	67.5464
Total	**0.0289**	**0.2603**	**0.5162**	**7.6000e-004**	**2.4000e-004**	**0.0112**	**0.0115**	**4.0000e-005**	**0.0103**	**0.0104**	**0.0000**	**67.0047**	**67.0047**	**0.0217**	**0.0000**	**67.5464**

3.2 Mobolization/Site Prep - Year 2 - 2029

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	2.3300e-003	0.0813	0.0592	3.2000e-004	7.8400e-003	1.6000e-004	8.0000e-003	2.1500e-003	1.5000e-004	2.3100e-003	0.0000	36.3304	36.3304	8.0200e-003	0.0000	36.5308
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	2.1000e-004	1.0000e-004	1.3500e-003	1.0000e-005	8.5000e-004	0.0000	8.5000e-004	2.2000e-004	0.0000	2.3000e-004	0.0000	0.5799	0.5799	1.0000e-005	0.0000	0.5801
Total	**2.5400e-003**	**0.0814**	**0.0605**	**3.3000e-004**	**8.6900e-003**	**1.6000e-004**	**8.8500e-003**	**2.3700e-003**	**1.5000e-004**	**2.5400e-003**	**0.0000**	**36.9102**	**36.9102**	**8.0300e-003**	**0.0000**	**37.1109**

3.3 Monitoring - Year 2 - 2029

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	0.0000	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**	**0.0000**	**0.0000**

3.3 Monitoring - Year 2 - 2029

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	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	2.1000e-004	1.0000e-004	1.3500e-003	1.0000e-005	8.5000e-004	0.0000	8.5000e-004	2.2000e-004	0.0000	2.3000e-004	0.0000	0.5799	0.5799	1.0000e-005	0.0000	0.5801
Total	**2.1000e-004**	**1.0000e-004**	**1.3500e-003**	**1.0000e-005**	**8.5000e-004**	**0.0000**	**8.5000e-004**	**2.2000e-004**	**0.0000**	**2.3000e-004**	**0.0000**	**0.5799**	**0.5799**	**1.0000e-005**	**0.0000**	**0.5801**

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	0.0000	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**	**0.0000**	**0.0000**

3.3 Monitoring - Year 2 - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	2.1000e-004	1.0000e-004	1.3500e-003	1.0000e-005	8.5000e-004	0.0000	8.5000e-004	2.2000e-004	0.0000	2.3000e-004	0.0000	0.5799	0.5799	1.0000e-005	0.0000	0.5801
Total	**2.1000e-004**	**1.0000e-004**	**1.3500e-003**	**1.0000e-005**	**8.5000e-004**	**0.0000**	**8.5000e-004**	**2.2000e-004**	**0.0000**	**2.3000e-004**	**0.0000**	**0.5799**	**0.5799**	**1.0000e-005**	**0.0000**	**0.5801**

3.4 Sediment and Debris Removal - Year 2 - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.9000e-004	1.3700e-003	3.6700e-003	1.0000e-005		7.0000e-005	7.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.5106	0.5106	1.7000e-004	0.0000	0.5148
Total	**1.9000e-004**	**1.3700e-003**	**3.6700e-003**	**1.0000e-005**		**7.0000e-005**	**7.0000e-005**		**6.0000e-005**	**6.0000e-005**	**0.0000**	**0.5106**	**0.5106**	**1.7000e-004**	**0.0000**	**0.5148**

3.4 Sediment and Debris Removal - Year 2 - 2029

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	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	1.0000e-005	0.0000	5.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0217	0.0217	0.0000	0.0000	0.0217
Total	**1.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0217**	**0.0217**	**0.0000**	**0.0000**	**0.0217**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.9000e-004	1.3700e-003	3.6700e-003	1.0000e-005		7.0000e-005	7.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.5106	0.5106	1.7000e-004	0.0000	0.5148
Total	**1.9000e-004**	**1.3700e-003**	**3.6700e-003**	**1.0000e-005**		**7.0000e-005**	**7.0000e-005**		**6.0000e-005**	**6.0000e-005**	**0.0000**	**0.5106**	**0.5106**	**1.7000e-004**	**0.0000**	**0.5148**

3.4 Sediment and Debris Removal - Year 2 - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	1.0000e-005	0.0000	5.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0217	0.0217	0.0000	0.0000	0.0217
Total	**1.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0217**	**0.0217**	**0.0000**	**0.0000**	**0.0217**

3.5 Shallow Water Removal - Year 2 - 2029

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	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	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**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.5 Shallow Water Removal - Year 2 - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	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**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.6 Deep Water Removal - Year 2 - 2029

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
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
Worker					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**

3.6 Deep Water Removal - Year 2 - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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
Worker					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**

3.6 Deep Water Removal - Year 2 - 2030

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
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
Worker					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**

3.6 Deep Water Removal - Year 2 - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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
Worker					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**

3.7 Offloading/Stablization/Dewatering - Year 2 - 2029

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					1.4000e-004	0.0000	1.4000e-004	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0850	0.6147	0.9432	2.1900e-003		0.0266	0.0266		0.0245	0.0245	0.0000	192.5007	192.5007	0.0623	0.0000	194.0572
Total	**0.0850**	**0.6147**	**0.9432**	**2.1900e-003**	**1.4000e-004**	**0.0266**	**0.0267**	**2.0000e-005**	**0.0245**	**0.0245**	**0.0000**	**192.5007**	**192.5007**	**0.0623**	**0.0000**	**194.0572**

3.7 Offloading/Stablization/Dewatering - Year 2 - 2029

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	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	1.5000e-004	7.0000e-005	9.5000e-004	0.0000	6.0000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.4092	0.4092	1.0000e-005	0.0000	0.4093
Total	**1.5000e-004**	**7.0000e-005**	**9.5000e-004**	**0.0000**	**6.0000e-004**	**0.0000**	**6.0000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**0.4092**	**0.4092**	**1.0000e-005**	**0.0000**	**0.4093**

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					1.4000e-004	0.0000	1.4000e-004	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0850	0.6147	0.9432	2.1900e-003		0.0266	0.0266		0.0245	0.0245	0.0000	192.5005	192.5005	0.0623	0.0000	194.0569
Total	**0.0850**	**0.6147**	**0.9432**	**2.1900e-003**	**1.4000e-004**	**0.0266**	**0.0267**	**2.0000e-005**	**0.0245**	**0.0245**	**0.0000**	**192.5005**	**192.5005**	**0.0623**	**0.0000**	**194.0569**

3.7 Offloading/Stablization/Dewatering - Year 2 - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	1.5000e-004	7.0000e-005	9.5000e-004	0.0000	6.0000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.4092	0.4092	1.0000e-005	0.0000	0.4093
Total	**1.5000e-004**	**7.0000e-005**	**9.5000e-004**	**0.0000**	**6.0000e-004**	**0.0000**	**6.0000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**0.4092**	**0.4092**	**1.0000e-005**	**0.0000**	**0.4093**

3.7 Offloading/Stablization/Dewatering - Year 2 - 2030

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					1.4000e-004	0.0000	1.4000e-004	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0316	0.0989	0.2987	7.6000e-004		2.9100e-003	2.9100e-003		2.9100e-003	2.9100e-003	0.0000	71.7731	71.7731	2.5200e-003	0.0000	71.8361
Total	**0.0316**	**0.0989**	**0.2987**	**7.6000e-004**	**1.4000e-004**	**2.9100e-003**	**3.0500e-003**	**2.0000e-005**	**2.9100e-003**	**2.9300e-003**	**0.0000**	**71.7731**	**71.7731**	**2.5200e-003**	**0.0000**	**71.8361**

3.7 Offloading/Stablization/Dewatering - Year 2 - 2030

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	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	4.0000e-005	2.0000e-005	2.8000e-004	0.0000	1.9000e-004	0.0000	1.9000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1243	0.1243	0.0000	0.0000	0.1243
Total	**4.0000e-005**	**2.0000e-005**	**2.8000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.1243**	**0.1243**	**0.0000**	**0.0000**	**0.1243**

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					1.4000e-004	0.0000	1.4000e-004	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0316	0.0989	0.2987	7.6000e-004		2.9100e-003	2.9100e-003		2.9100e-003	2.9100e-003	0.0000	71.7730	71.7730	2.5200e-003	0.0000	71.8360
Total	**0.0316**	**0.0989**	**0.2987**	**7.6000e-004**	**1.4000e-004**	**2.9100e-003**	**3.0500e-003**	**2.0000e-005**	**2.9100e-003**	**2.9300e-003**	**0.0000**	**71.7730**	**71.7730**	**2.5200e-003**	**0.0000**	**71.8360**

3.7 Offloading/Stablization/Dewatering - Year 2 - 2030

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	4.0000e-005	2.0000e-005	2.8000e-004	0.0000	1.9000e-004	0.0000	1.9000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1243	0.1243	0.0000	0.0000	0.1243
Total	**4.0000e-005**	**2.0000e-005**	**2.8000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.1243**	**0.1243**	**0.0000**	**0.0000**	**0.1243**

3.8 Transportation - Year 2 - 2029

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					3.0200e-003	0.0000	3.0200e-003	4.6000e-004	0.0000	4.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	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**	**3.0200e-003**	**0.0000**	**3.0200e-003**	**4.6000e-004**	**0.0000**	**4.6000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.8 Transportation - Year 2 - 2029

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	0.0118	0.3239	0.3149	1.7800e-003	0.0557	8.8000e-004	0.0566	0.0150	8.4000e-004	0.0159	0.0000	201.7226	201.7226	0.0454	0.0000	202.8584
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	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	**0.0118**	**0.3239**	**0.3149**	**1.7800e-003**	**0.0557**	**8.8000e-004**	**0.0566**	**0.0150**	**8.4000e-004**	**0.0159**	**0.0000**	**201.7226**	**201.7226**	**0.0454**	**0.0000**	**202.8584**

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					3.0200e-003	0.0000	3.0200e-003	4.6000e-004	0.0000	4.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	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**	**3.0200e-003**	**0.0000**	**3.0200e-003**	**4.6000e-004**	**0.0000**	**4.6000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.8 Transportation - Year 2 - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0118	0.3239	0.3149	1.7800e-003	0.0557	8.8000e-004	0.0566	0.0150	8.4000e-004	0.0159	0.0000	201.7226	201.7226	0.0454	0.0000	202.8584
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	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	**0.0118**	**0.3239**	**0.3149**	**1.7800e-003**	**0.0557**	**8.8000e-004**	**0.0566**	**0.0150**	**8.4000e-004**	**0.0159**	**0.0000**	**201.7226**	**201.7226**	**0.0454**	**0.0000**	**202.8584**

3.8 Transportation - Year 2 - 2030

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					3.0200e-003	0.0000	3.0200e-003	4.6000e-004	0.0000	4.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	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**	**3.0200e-003**	**0.0000**	**3.0200e-003**	**4.6000e-004**	**0.0000**	**4.6000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.8 Transportation - Year 2 - 2030

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	3.0800e-003	0.0818	0.0847	4.6000e-004	0.0473	2.2000e-004	0.0476	0.0120	2.1000e-004	0.0122	0.0000	52.9557	52.9557	0.0122	0.0000	53.2594
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	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	**3.0800e-003**	**0.0818**	**0.0847**	**4.6000e-004**	**0.0473**	**2.2000e-004**	**0.0476**	**0.0120**	**2.1000e-004**	**0.0122**	**0.0000**	**52.9557**	**52.9557**	**0.0122**	**0.0000**	**53.2594**

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					3.0200e-003	0.0000	3.0200e-003	4.6000e-004	0.0000	4.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	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**	**3.0200e-003**	**0.0000**	**3.0200e-003**	**4.6000e-004**	**0.0000**	**4.6000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.8 Transportation - Year 2 - 2030

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	3.0800e-003	0.0818	0.0847	4.6000e-004	0.0473	2.2000e-004	0.0476	0.0120	2.1000e-004	0.0122	0.0000	52.9557	52.9557	0.0122	0.0000	53.2594
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	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	**3.0800e-003**	**0.0818**	**0.0847**	**4.6000e-004**	**0.0473**	**2.2000e-004**	**0.0476**	**0.0120**	**2.1000e-004**	**0.0122**	**0.0000**	**52.9557**	**52.9557**	**0.0122**	**0.0000**	**53.2594**

3.9 Backfilling - Year 2 - 2029

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	0.0000	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**	**0.0000**	**0.0000**

3.9 Backfilling - Year 2 - 2029

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	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	6.0000e-005	3.0000e-005	4.0000e-004	0.0000	2.5000e-004	0.0000	2.5000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.1734	0.1734	0.0000	0.0000	0.1735
Total	**6.0000e-005**	**3.0000e-005**	**4.0000e-004**	**0.0000**	**2.5000e-004**	**0.0000**	**2.5000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.1734**	**0.1734**	**0.0000**	**0.0000**	**0.1735**

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	0.0000	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**	**0.0000**	**0.0000**

3.9 Backfilling - Year 2 - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	6.0000e-005	3.0000e-005	4.0000e-004	0.0000	2.5000e-004	0.0000	2.5000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.1734	0.1734	0.0000	0.0000	0.1735
Total	**6.0000e-005**	**3.0000e-005**	**4.0000e-004**	**0.0000**	**2.5000e-004**	**0.0000**	**2.5000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.1734**	**0.1734**	**0.0000**	**0.0000**	**0.1735**

3.10 Cap/Armouring - mechanical - Year 2 - 2029

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					2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	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**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.10 Cap/Armouring - mechanical - Year 2 - 2029

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	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	2.0000e-005	1.0000e-005	1.4000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0596	0.0596	0.0000	0.0000	0.0596
Total	**2.0000e-005**	**1.0000e-005**	**1.4000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0596**	**0.0596**	**0.0000**	**0.0000**	**0.0596**

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					2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	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**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.10 Cap/Armouring - mechanical - Year 2 - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	2.0000e-005	1.0000e-005	1.4000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0596	0.0596	0.0000	0.0000	0.0596
Total	**2.0000e-005**	**1.0000e-005**	**1.4000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0596**	**0.0596**	**0.0000**	**0.0000**	**0.0596**

3.11 Cap/Armouring - hand - Year 2 - 2029

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	2.2000e-004	2.2500e-003	3.7600e-003	1.0000e-005		9.0000e-005	9.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.4624	0.4624	1.5000e-004	0.0000	0.4662
Total	**2.2000e-004**	**2.2500e-003**	**3.7600e-003**	**1.0000e-005**	**0.0000**	**9.0000e-005**	**9.0000e-005**	**0.0000**	**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.4624**	**0.4624**	**1.5000e-004**	**0.0000**	**0.4662**

3.11 Cap/Armouring - hand - Year 2 - 2029

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	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	2.0000e-005	1.0000e-005	1.1000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0488	0.0488	0.0000	0.0000	0.0488
Total	**2.0000e-005**	**1.0000e-005**	**1.1000e-004**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0488**	**0.0488**	**0.0000**	**0.0000**	**0.0488**

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	2.2000e-004	2.2500e-003	3.7600e-003	1.0000e-005		9.0000e-005	9.0000e-005		8.0000e-005	8.0000e-005	0.0000	0.4624	0.4624	1.5000e-004	0.0000	0.4662
Total	**2.2000e-004**	**2.2500e-003**	**3.7600e-003**	**1.0000e-005**	**0.0000**	**9.0000e-005**	**9.0000e-005**	**0.0000**	**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.4624**	**0.4624**	**1.5000e-004**	**0.0000**	**0.4662**

3.11 Cap/Armouring - hand - Year 2 - 2029

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
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	2.0000e-005	1.0000e-005	1.1000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0488	0.0488	0.0000	0.0000	0.0488
Total	**2.0000e-005**	**1.0000e-005**	**1.1000e-004**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0488**	**0.0488**	**0.0000**	**0.0000**	**0.0488**

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

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	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

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	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**	**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

	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**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					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**

7.2 Water by Land Use

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Attachment C

Biological Resource Analysis

BIOLOGICAL RESOURCE ANALYSIS,
PIERS 39 TO 43½ SEDIMENT REMEDIATION PROJECT

San Francisco, San Francisco County, California

October 2021

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CONSULTING, LLC

SEDIMENT REMEDIATION PROJECT

PIERS 39 TO 43½

BIOLOGICAL RESOURCE ANALYSIS

TABLES

LIST OF FIGURES

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LIST OF ABBREVIATED TERMS

ACZA	ammoniacal copper zinc arsenate
AMM(s)	avoidance and minimization measure(s)
aRPD	apparent redox potential discontinuity
Bay	San Francisco Bay
Bay Plan	San Francisco Bay Plan
BCDC	San Francisco Bay Conservation and Development Commission
BMP	best management practice
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	decibels
dBA	A-weighted decibels
DPS	Distinct Population Segment
ECMP	Environmental Compliance Management Plan
EFH	Essential Fish Habitat
ESCP	Erosion and Sediment Control Plan
ESU	Evolutionarily Significant Unit
FESA	Federal Endangered Species Act
FMP	Fisheries Management Plan
FS/RAP	Feasibility Study/Remedial Action Plan
Goals Report	San Francisco Bay Subtidal Habitat Goals Report
HAPCs	Habitat Areas of Particular Concern
HF	high-frequency
IHA	Incidental Harassment Authorization
IPaC	Information for Planning and Consultation
IS	Initial Study
ITP	Incidental Take Permit
LF	low-frequency
LOA	Letter of Authorization
LTMS	Long-Term Management Strategy
MBTA	Migratory Bird Treaty Act
MF	mid-frequency
MHF	material handling facility
MLLW	mean lower low water
MMMP	Marine Mammal Monitoring Plan
MMO	marine mammal observer

MMPA	Marine Mammal Protection Act
MMMP	Marine Mammal Monitoring Plan
MND	Mitigated Negative Declaration
MPA	McAteer-Petris Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MS4s	municipal separate storm sewer systems
NAPL	non-aqueous phase liquid
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
OUL	Operational Use Limit
PAH	polycyclic aromatic hydrocarbon
PG&E	Pacific Gas and Electric Company
Port	Port of San Francisco
Porter Cologne	Porter Cologne Water Quality Control Act
PTS	permanent threshold shift
quad	quadrangle
RAO	remedial action objective
Regional Water Board	San Francisco Bay Regional Water Quality Control Board
RHA	Rivers and Harbors Act
RMMP	Risk Management and Monitoring Plan
RMS	Root Mean Square
SAMP	Sound Attenuation and Monitoring Plan
SEL	sound exposure level
SELcum	cumulative SEL
SF-DODS	San Francisco Deep Ocean Disposal Site
SPCWMP	Sediment Processing and Construction Water Management Plan
SPI/PV	Sediment Profile and plan view imaging SWPPP Storm Water Pollution Prevention Plan
SWQMP	Surface Water Quality Monitoring Plan
SWRCB	California State Water Resources Control Board
TTS	temporary threshold shift
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WDR	waste discharge requirements
WOTUS	waters of the U.S./State
WMTP	Waste Management and Transportation Plan

SECTION 1. INTRODUCTION

1.1 Purpose of the Document

The San Francisco Bay Regional Water Quality Control Board (Regional Water Board) is completing an Initial Study (IS) for remediation of offshore sediment (Project) at Piers 39 to 43½ (Project Area), within the Port of San Francisco (Port) , in accordance with the requirements of the California Environmental Quality Act (CEQA) (California Public Resources Code, Division 13, Section 2100 et seq.) and CEQA Guidelines (Title 14, California Code of Regulations, Chapter 3, Section 15000 et seq.). The Water Board is the CEQA Lead Agency for the Project.

The purpose of this Biological Resource Analysis is to gather information necessary to complete a review of biological resources under CEQA and to support the regulatory permit application process. The analysis herein considers the Project location in conjunction with proposed work activities to analyze potential Project-related impacts on the natural environment. The Project analyzed is the recommended alternative for remediation as described in the Feasibility Study/Remedial Action Plan (FS/RAP), prepared by Haley & Aldrich, Inc. on behalf of Pacific Gas and Electric Company (PG&E) (the Project sponsor) (Haley & Aldrich 2020a).

1.2 Project Location

The Project Area consists of the Piers 39 to 43½ offshore sediment remediation area and an upland area (or areas), which would include the material handling facility (MHF) for dredged material management and handling (i.e., dewatering and conditioning) as well as staging area(s) (Figure 1). The material management is anticipated to take place within the Port's Piers 94-96, or as an alternative option, at Berth 10 at the Port of Oakland. The Piers 94-96 area is assumed to be the preferred MHF and staging area and is the primary area evaluated herein. Berth 10 is evaluated as a secondary location.

The sediment remediation area encompasses Pier 39, both the Pier 39 East and West Basins, and the intertidal and subtidal area between Pier 39 and Pier 43½ along the margin of San Francisco Bay (Bay) in San Francisco. The Project Area is located within the San Francisco North U.S. Geological Survey (USGS) 7.5' topographic quadrangle (quad) (S28, T1S, R5W) (37.809666° N, 122.411817° W) (Figure 2). Piers 39 to 43½ extend into the Bay to the north of The Embarcadero, a major road, oriented east–west to the south of the Project Area, approximately between Taylor Street and Kearny Street. The seawall, which extends east–west along the entire Project Area and is located bayward of the historical natural shoreline (i.e., the shoreline that existed before filling of the Bay), serves as the southern boundary of the Project Area. The bayward limits of the Project Area extend approximately 1,000 feet offshore. The sediment investigation area extended west to Pier 45 and east to Pier 35 and encompassed approximately 47 acres of submerged land.

The Port's Piers 94-96 are located on the southern waterfront approximately 6 miles south of the Project Area and are proposed for use for clean equipment staging and handling of dredged sediments. Each pier is comprised of a pile-supported concrete wharf and asphalt-covered land sufficient for vessel berthing and staging and material handling activities included in the Project.

Berth 10 is in the northwestern corner of the Port of Oakland near the foot of the San Francisco-Oakland Bay Bridge. The rehandling facility was constructed at Berth 10 in 1995-1996 to "rehandle (i.e., dewater and otherwise prepare) dredged material prior to transportation to and disposal at a permitted landfill or, if determined suitable, beneficial reuse at an upland site" (Water Board, 2013). About half of the facility is constructed on a pile-supported concrete wharf and the remaining half is on asphalt-covered land. The 4.4-acre facility is enclosed by a system of gravel and earthen berms topped with concrete "K" rail" (Water Board, 2013).

1.3 Project Area History

The Pier 39 to Pier 43½ area and adjacent uplands were historically part of the Bay. The existing seawall was constructed in phases between 1878 and 1913. Between 1913 and 1917, Piers 29 to 41 were built along the waterfront, with Pier 45 constructed in 1929 and Piers 43 and 43½ built by 1938. Piers 39 and 41 were demolished in approximately 1976 and Pier 39 was redeveloped as a commercial destination, flanked by the East Basin and West Basin, opening in 1978. Pier 43 was mostly demolished and the current Pier 41½ was constructed between 1980 and 2011. In 2013, the Port completed a project to improve public access along the waterfront by removing most of Pier 43½ and constructing a new pedestrian and bicycle promenade.

Beginning in 1899, the former Beach Street Manufactured Gas Plant (comprising the block bounded by Jefferson, Mason, Beach and Powell Streets, which is now occupied by the Hotel Zephyr, restaurants, and a variety of tourist shops) had been used to manufacture various products, including coke and coal gas and carbureted water and oil gas. PG&E purchased the former Beach Street MGP in 1911 and operated it until 1931, when gas manufacturing ceased at the site as natural gas became available in San Francisco. Three different gasification processes are known to have been used at the former Beach Street Manufactured Gas Plant, which produced by-products including non-aqueous phase liquid (NAPL), coal tars, and solid lampblack. These by-products predominantly contain polycyclic aromatic hydrocarbons (PAHs), many of which can be sold as fuel or for other uses. Raw materials, such as coal, and gasification by-products, such as NAPL tars and lampblack, were commonly transported over water in the Bay. Loading and offloading was a common source of spillage in the vicinity of docking areas. In the era prior to regulated waste management, however, it is also plausible that excess material may have been placed in the Bay along the shoreline and/or from historical piers that extended into the Bay.

1.4 Project Purpose and Need

Previous environmental investigations indicated that contaminants are present in offshore sediments within the Project Area. The chemical of concern has been identified as PAHs. The purpose of the Project is to remediate (i.e., clean up) sediments impacted (i.e., contaminated) with PAHs within the Project Area, to protect human health and the environment. The recommended alternative for remediation and remedial action objectives (RAOs) are provided in the FS/RAP describe the objectives of the Project as follows:

- Prevent toxicity to fish, birds, and humans exposed to PAHs through consumption of biota with PAH concentrations bioaccumulated in prey tissue via direct contact with sediments and associated pore water or through the aquatic food web.

SECTION 2. PROPOSED PROJECT

2.1 Project Overview

The recommended remedial approach would include a combination of dredging and capping and/or armoring of the impacted sediments to minimize or reduce exposure to the impacted sediment and erosion protection measures to mitigate scour caused by ferry and boat traffic and other foreseeable operational uses, coupled with monitoring, and institutional controls. Slope stabilization may be necessary in certain areas. Contaminated sediments removed from the Project Area would be dewatered and conditioned (i.e., dried and prepared for transportation), loaded into trucks, and disposed of properly. Some of the sediments may be suitable for beneficial reuse. Following the completion of work, equipment demobilization and restoration of the Project Area and the MHF and staging area(s) would occur.

Within the Project Area, the area of remediation activities (the work area) is divided into five remedial response areas (Figure 3). The remedial response areas are:

- Area A – Pier 43½ offshore area and western limit of the response Areas, just to the east of Pier 45
- Area B – Pier 43 offshore area
- Area C – Pier 41½ offshore area (Area C2) and the area under Pier 41½ (Area C1)
- Area D – Pier 39 West Basin
- Area E – Pier 39 East Basin

Specific remediation measures are proposed for each of the remedial response areas. These measures include dredging and/or capping, with erosion protection, as necessary. Depths of dredging and capping/armoring were determined in light of current and anticipated future maritime operations and site use, in the vicinity of the Project Area, which includes maintenance dredging in the ferry terminals, berths, and marinas. Maintenance dredge permits were recently renewed to reflect updated lateral boundaries and dredging elevations, developed by the Port and its tenants based on current and planned navigation and operational needs, referred to as Operational Use Limits [OULs]. The total area that would be disturbed by work activities, including dredging and capping/armoring activities, is approximately 9.8 acres.

The description of Project components below outlines the proposed remedial action and the overall approach and general methods for implementation of remediation. Prior to implementation, remedial design plans and specifications would be developed to refine design and construction methods and requirements. A geotechnical study and other sediment investigations may also be performed to inform design; these studies may require borings. The contractor selected to implement the Project would further define construction means and methods. Approach and methods provided below allow for the evaluation of potential construction-related impacts on the natural environment and identification of appropriate mitigation measures to ensure protection of resources.

2.2 Project Components

2.2.1 Site Preparation

Landside staging would include construction staff parking (existing lots would be used where available), establishing access, and staging construction equipment and material. In-water staging would be areas for barge and other waterside equipment anchoring. If required by the U.S. Coast Guard, aids to navigation may also be installed. Supplemental geotechnical information would be collected to further characterize subsurface conditions. A geotechnical investigation to supplement existing data would be completed to better define sediment properties for facilitating the remedy design for the recommended remedial alternative.

2.2.1.1 Water Quality and Containment

Temporary containment structures, turbidity curtains, and/or other sediment transport barriers would be required to isolate the dredging area from the rest of the work area (including the material management and handling locations) and to prevent adverse impacts on water quality and contamination of adjacent areas during dredging. Prior to commencement of dredging operations, in-water water quality control measures, consisting of temporary containment structures, turbidity curtains, and/or other sediment transport barriers, would be installed to isolate the sediment removal area and to prevent adverse impacts on water quality and contamination of adjacent areas. Steel piles (less than 24 inches in diameter) would be temporarily installed at key locations around each remedial response area to facilitate installation of turbidity curtains. Over the life of this project this could require installation and removal of approximately 50 steel piles. Additional piles may be required within the material management and handling areas. The piles, along with temporary anchoring locations (such as an anchor barge), would allow for shifting curtain configurations as work progresses through each remedial response area. These temporary piles would be removed upon completion of work (i.e., no permanent piles would be added as part of Project-related activities). In general, vibratory methods would be used to install and remove piles.

2.2.1.2 Temporary Relocation of Floating Docks

To facilitate access to impacted sediment, a portion of existing floating docks particularly within the Area E would be temporarily relocated and stored. Where existing piles may interfere with dredging access or debris removal, temporary removal of existing piles (concrete, steel, or wood) would be necessary. Existing piles would be removed and reinstalled after dredging is completed and before or during installation of the cap and associated armoring material (erosion protection). There are approximately 859 piles within the work area and buffer zone (within 5 feet of the edge of dredge prisms, except in areas where the dredge prism abuts structures, where a 10-foot offset buffer is applied). The majority of these piles would be left in place, as they provide important structural support for the piers. Approximately 226 wood piles within Area E would need to be temporarily removed, and most would be replaced.

Upon completion of remediation work, the Project Area would be restored, with piles replaced in-kind (e.g., if a wood pile is removed, it would be replaced in-kind with another similarly sized pile), and replacement and repairs would be provided for all infrastructure removed or damaged during remediation work. Piles made of inferior material (e.g., creosote-treated wood) that are removed from the Project Area would be replaced with an alternative environmentally acceptable materials (e.g., BMP-certified treated wood, wrapped or coated treated wood). In general, vibratory methods would be used to remove and install piles. If load testing is required for pile reinstallation, appropriate measures such as impact hammering to final depth would be implemented. In other cases, when complete pile removal is not feasible, piles may be cut at or below the mudline.

Temporarily relocated docks may be replaced or repurposed at the discretion of the Port and its tenants. Some repair of docks may be necessary due to damage during relocation, but the overall dock configuration/capacity would not change (i.e., total floating cover area within the offshore areas, post-remedy, would not be increased beyond the current floating cover).

2.2.2 Debris Removal

Where applicable, debris and remnants of piers (collectively referred to as marine debris) would be removed prior to or concurrent with dredging. Marine debris likely to be encountered during dredging activities includes pier pilings and remnants, rock, rubbish, and trash. The observable surface debris varies by remedial response area; for example, there is a large "debris field" at Area B (approximately 30,000 square feet), whereas Area D has very little observable surface debris (less than 1,500 square feet). Marine debris removed prior to dredging would be collected from the Bay floor with a rake-type attachment or conventional bucket mounted on an excavator or crane, loaded on a barge, and managed at the MHF. Marine debris removed concurrently with dredging activities would be removed consistent with methods used for sediment removal (smaller debris entrained in the sediment would not be screened or removed during the dredging or offloading processes) and managed at the MHF. Debris would be segregated and decontaminated, if possible, and staged for either recycling or disposal at an appropriate facility. Total debris to be removed is estimated to be approximately 21,000 cubic yards of material within 1.6 acres. In addition, debris may be removed from outside of the remedial response areas, but within the project boundary, for the benefit of the aquatic environment.

2.2.3 Dredging

Impacted sediment would be removed to depths up to 4 feet below the anticipated future maintenance dredging elevation within the OULs and up to 3 feet below the current sediment surface outside of OULs. To protect structural integrity of existing structures, a buffer (i.e., a "safe offset") would be established around the structures (e.g., piers, seawall, breakwaters, fishing piers in Area C). Within the offset buffers from structures, where necessary to address impacts in the surface sediments, best efforts would be made to remove up to 3 feet of sediment. A 6-inch overdredge allowance is assumed across the footprint of the proposed removal limit. In areas where scour holes have formed because of vessel operational uses, current sediment elevations occur below the OUL-specific dredging elevations. No removal is assumed for these scour holes or for sediment areas where the OUL-specific removal depth is within 3 feet of the existing grade, because the scouring has created sufficient clearance to accommodate an engineered cap that would remain below the OUL elevation. The total removal/dredging volume is assumed to be approximately 100,000 cubic yards or less (currently estimated at 88,000 cubic yards) over approximately 9.8 acres.

Impacted sediment would be removed using mechanical dredges, operated primarily from water-based equipment consisting of a barge-mounted crane or excavator, typically outfitted with an environmental clamshell bucket, when feasible. Diver-assisted micro (hydraulic) dredging, land-based excavation using a mini-excavator, and/or manual labor could be used to perform removal in areas beneath docks, piers, or wharves that are inaccessible to water-based mechanical dredge equipment.

2.2.4 Material Handling and Management

All dredged material (and non-native debris) removed from the Project Area would be placed onto barges, with excess water entrained, and transported to the MHF, dewatered and conditioned, properly characterized, and loaded into trucks for disposal at a licensed landfill. A limited quantity of material (feasible only for portions of Area E; it is estimated that no more than 20 percent of Area E removal volumes may qualify) is likely to qualify as suitable for beneficial reuse or would be clean enough to be disposed at the San Francisco Deep Ocean Disposal Site (SF-DODS). Similarly, non-native debris removed prior to or concurrent with dredging operations would be loaded into barge scows and transported to the material management area, where it would be sorted and processed for disposal, reuse, or recycling.

Staging areas and material management activities are anticipated to take place within the Port's Piers 94-96, or as an alternative option, material management could take place at Berth 10 at the Port of Oakland (Figure 4). The location(s) for sediment management could depend on availability of the offsite facilities at the time of the work. Additional evaluation of potential transload facilities would be conducted during the remedial design.

2.2.5 Slope Stabilization

Based on pre-design investigations, field observations, and preliminary geotechnical evaluations completed in support of remedy design, slope stabilization will be necessary in certain areas of the Project. An analysis of the existing sediment characteristics and strength properties suggests that when modeled with design level seismic forces, select dredged and capped areas may be prone to either rotational or sliding failure. Soil pinning would be used to promote slope stability pending further design evaluations. As part of the preliminary design, soil pinning will include the installation of an array of approximately 12" diameter tapered piles (e.g., timber) at approximately 7-foot centers across the face of select areas of the slopes to improve the connection between the various soil horizons and tie the slope to deeper sediment units with improved strength. These permanent piles would be installed vertically to a depth of approximately 50 feet below the dredge surface elevation, using impact or vibratory methods, in a uniform array across the face of select dredge slopes. The piles would be driven such that the butt (or top) of the pile would be embedded below the dredged surface before being covered with cap materials and armor stone, where the top of the pile would reside 3- to 4-feet below, the finished elevation of the restored bay floor. Preliminary design estimates suggest approximately 1,200 piles may be necessary for installation along the face of the dredged area adjacent to the Embarcadero and/or along the Fisherman's Wharf. Final installation details, material types, and total pile counts will be developed during the final design process.

2.2.6 Capping

After debris removal, dredging, and slope stabilization is complete, impacted sediment to be left in place would be physically isolated through placement of a cap and/or armor layer, (where necessary) to protect against erosion (scour) caused by ferry and boat traffic and other foreseeable operational uses. While all dredged areas would be capped, not all capped areas would be dredged. For example, a cap and/or armor would also be installed to isolate impacted sediment under existing Pier 41½ in Area C1, where dredge equipment access is limited or infeasible. The total cap/armor material volume is assumed to be approximately 51,500 cubic yards and would cover approximately 9.8 acres.

Cap material options include granular cap media (e.g., sand), bay mud, and/or beneficial reuse of clean dredge materials from the Bay, which is generally a mixture of bay mud and coarser grained sediments (silts and sands). Enhancement of conventional cap materials using reactive amendments such as activated carbon or organoclay may be used, where necessary, to reduce and/or impede chemical transport through the cap (Figure 5).

Cap materials would be placed using barge-mounted cranes or excavators, using broadcasting equipment (e.g., conveyors, impellers), or by pumping as a slurry, depending on access. Mechanical placement with excavators or cranes would allow cap material to be lowered through the water column before the material is released to mitigate water quality impacts. Mechanical placement would also enable thinner and more evenly distributed lifts of cap material to be placed. Material broadcasting (e.g., conveyors) or slurry-based technologies would allow for capping materials to be deployed under piers, docks, wharves, or other limited-access areas. Capping within Area C1, where necessary, would be conducted by hand during low tide and/or by broadcasting/slurry methods. In the unlikely event that the pier and structures over Area C1 are removed prior to implementation of this remedial action, the area would instead be addressed similar to the other remedial response areas (i.e., through removal, with or without capping and/or armoring after removal).

2.2.7 Armoring

Structural elements (such as riprap or engineered articulating tiles) would be used, as necessary, to protect the chosen cap (conventional or reactive cap) throughout the Project Area from damage by erosion, scouring, heavy equipment, or other forces. As necessary, a granular filter layer would be installed between the capping and armoring layers to enhance installation stability.

2.2.8 Supplemental Erosion Protection

Much of the shoreline zone is under structural piers, wharves, and docks. A photographic survey of the shoreline zone identified deficiencies in approximately 400 square feet of the riprap revetment (i.e., areas where riprap is missing). Suitably sized riprap would be placed over exposed sediment where there is a gap in the shoreline revetment. In addition, an approximately 20-foot-wide strip of additional armoring (totaling approximately 30,000 square feet) would be placed over soft sediments between the capped/armored locations and the existing shoreline riprap revetment area to tie the capped/armored area into the subtidal area to protect this edge of the remedy from localized scouring (Figure 6. Supplemental Erosion Protection). Upgrades of erosion protection around existing outfalls may also occur (e.g., stone spillways and aprons, head cut protection), as warranted.

2.2.9 Pile Removal and Installation

Three project components would require either the removal or installation of piles.

1. Turbidity Curtain Structural Supports: Temporary piles are expected to be driven at key locations around each remedial response area to facilitate turbidity curtain configurations. The piles, along with temporary anchoring locations (such as an anchor barge), would allow for shifting curtain configurations as work progresses through each remedial response area. These temporary piles would be removed upon completion of work. Piles used in this manner for the support of the turbidity curtains may be installed, removed, and temporarily stored for eventual reuse.
2. Temporary Pile Removal and Dock Relocation in Area E: To facilitate dredging and cap installation, approximately 226 piles within the Pier 39 East Basin (Area E) may be temporarily removed and reinstalled to restore the marina docks.
3. Soil Pinning: Where required for the purpose of establishing slope stability, approximately 1,200 piles, 12" in diameter, would be embedded below the dredged surface, to a depth of 50 feet, across the face of select areas of the slopes in all remedial response areas.

2.2.10 Post-Remediation Project Components

2.2.10.1 Institutional Controls

ICs could include restrictions on the use of anchors in select areas, creation of no-wake zones, limits to future maintenance dredging beyond the currently anticipated OULs. These would be implemented in areas where impacted sediment is capped or remain in place underneath existing sediment. Selected ICs would be included in a Risk Management and Monitoring Plan (RMMP).

2.2.10.2 Post-Construction Risk Management and Monitoring Plan

The RMMP would describe post-remediation monitoring that would verify remedy effectiveness in terms of meeting the RAO, permanence, and conditions warranting cap maintenance, repair, or any other adaptive measures. The post-remediation monitoring scope would be developed in parallel with the design but is anticipated to include elements of cap performance (e.g., pore water sampling for indications of contaminant breakthrough) and integrity monitoring (e.g., bathymetry surveys for indications of cap scour/erosion). Post-remediation monitoring results would provide data suitable to support a 5-year remedy review by the Regional Water Board.

2.2.10.3 Aquatic Resource Restoration and Monitoring

As required by resource agencies, post-construction site restoration may be required. Site restoration activities could include installation of habitat layers designed for the purpose of promoting benthic recolonization or for the creation of suitable hard bottom habitat. If required, monitoring, including sediment imaging, of these layers may also be completed.

2.3 Construction Equipment and Staging

The construction activities described above may use the following types of equipment: support barges to move equipment and materials and other equipment, a barge-mounted cranes or excavator, small watercraft, land-based cranes, and crane-mounted vibratory or impact hammers. Construction operations would also require construction support vehicles, water trucks, dump trucks, water tanks, and pick-ups/SUVs. If it cannot be avoided, some work could take place from land adjacent to the work area, but the amount of work conducted from the land would be minimal and short in duration to minimize any impacts on tenant uses and public access. The staging areas would be used for storage of construction equipment and materials and other support for the in-water and over-water construction activities.

2.4 Construction Schedule

Construction is expected to commence in 2023 and potentially occur over a 5- to 10-year period in which each remedial response area would be constructed in phases, with each remedial response area constructed over the course of 1 year, except for Area E which could take up to 2 years (Table 1). Ultimately, the quantities of dredging and capping and the associated logistical constraints for each remedial response area would dictate the construction duration for each phase. Some work may be able to be completed outside these work windows, and in this case, or if the remedial work can be expedited in other ways, some remedial response areas may be combined within a single construction season or year; others could take more than 1 year to complete. Work is assumed to take place Monday through Saturday (6 days per week) for 10 hours per day, on average. Hours would generally be 7:00 a.m. to 6:00 p.m. (10 working hours per day) but some work could occur after hours or during night-time, with appropriate permits and approvals. Seasonal species-protective work windows are addressed in Section 7.

2.4.1 Work Activity Timing

In-water construction activities that are not anticipated to result in impacts to special-status fish species may take place outside the below in-water work windows. Other identified work activities would be limited to occur June 1 to November 30 to ensure unnecessary take or injury of fish does not occur.

Table 1. Proposed Construction Schedule

Year	Estimated Calendar Year	Primary Remedial Response Area	Secondary Remedial Response Area	Additional Notes
1	2023	Area A	Area B	Area A is scheduled first to accommodate the Red and White Fleet berth expansion planned for 2022.
2	2024	Area C	Area D	Area C is scheduled for the second year to minimize future disruption near ferry operation locations (Area A, Red and White Fleet, and Area C, Blue & Gold Fleet).
3	2025	Alternate Project		No work is scheduled during these years. Given the anticipation of a separate sediment remediation project that may need to use the MHF, the current sequencing includes a 2-year placeholder preventing work at the site to accommodate the other project.
4	2026	Alternate Project		
5	2027	Area D	Area E	Areas east of the breakwater that defines the Pier 39 West Basin would have priority after the 2-year placeholder.
6	2028	Area E	None	Given the volume of material anticipated to be dredged in Area E, the work in that area would be split into two phases spread out over two construction seasons.
7	2029	Area E	None	If Area E is complete in 2028, Year 8 would not be needed.

Notes:

- Primary Remedial Response Area: Area that would drive the schedule for the designated year.
- Secondary Remedial Response Area: Area that would be started, or completed if started during prior year, if time is available after completion of primary area.

2.5 Compliance and Monitoring Plans and Control Measures

Several compliance monitoring and plans would be developed, and an Environmental Compliance Management Plan (ECMP) would be implemented, to provide compliance monitoring during construction, to guide the development and implementation of construction controls, and to document conformance with the details provided in the plans and specifications of the remedial design. The monitoring program would include elements to demonstrate compliance with CEQA mitigation and permit requirements (i.e., based on agency approvals, permit submittals, and/or specific permit conditions). The environmental component of the monitoring program would include but not be limited to elements such as biological surveys and monitoring, monitoring for sheens, and water quality (e.g., turbidity) monitoring. Those plans applicable to biological resources are summarized in Section 7.2.

A number of control measures, also known as avoidance and minimization measures (AMMs), would be incorporated into Project Contract Documents to address environmental and public health and safety concerns. Control measures/AMMs are procedures known to further reduce the potential for adverse effects to the natural environment and are standard regulatory agency requirements, standards in the industry, and construction and operating experiences of the design engineer. During construction, controls would be implemented to minimize the temporary effect of construction on the surrounding community and environment. Such controls would include, but not be limited to, turbidity curtains to control potential release of suspended sediment outside the work area and containment booms and sorbent booms to contain and remove potential sheens. A bubble curtain sound attenuation system or isolation casing may be required during the certain project activities, if deemed necessary within project authorizations from applicable regulatory agencies. Those controls measures/AMMs applicable to biological resources are provided in Section 7.3.

SECTION 3. CURRENT CONDITION OF NATURAL ENVIRONMENT

3.1 Personnel and Survey Dates

Johnson Marigot Consulting, LLC personnel Sadie McGarvey, Paula Gill, and Lauren Bingham visited the Project Area on June 11 and August 22, 2019. Surveys included walking the accessible portions of the Project Area to characterize current conditions; to assess the presence of suitable resting, nesting, and/or roosting wildlife habitat; and to conduct an inventory of species observed within the Project Area. In addition, general current uses of the Project Area, as well as general observations of neighboring property uses, were noted. Prior to the survey, literature reviews of known and potential special-status species were conducted; including query of the California Natural Diversity Database (CNDDB); the California Native Plant Society (CNPS) Inventory of Rare, Threatened, and Endangered Plants of California; and the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) tool for special-status species having a range that overlaps with the Project Area boundaries. In addition, the National Marine Fisheries Service (NMFS) West Coast Region California Species List was reviewed for species observed on the same quadrangle as the Project Area (San Francisco North Quad).

3.2 Limitations and Assumptions That May Influence Results

All necessary portions of the Project Area were accessible to the surveying biologist. Surveys were conducted during the seasons when special-status species under the jurisdiction of National Oceanic and Atmospheric Administration (NOAA) Fisheries, USFWS, and California Department of Fish and Wildlife (CDFW) that could occur near the Project Area would be observable; however, wildlife species may be cryptic, generally difficult to detect, transient, nocturnal, or migratory species that may only occur within the Project Area for short or fleeting time periods. Wildlife species may only be active during particular times of the year, such as the breeding season, or may only use the Project Area temporarily. In addition, all species that occur in the Bay waters (e.g., green sturgeon) are typically not visible from land, except when animals breach the water's surface. For these reasons, wildlife species may be present but not observed. This limitation may influence the study results.

3.3 Existing Conditions

The Project Area is characterized as urban land and offshore areas (Figure 7). The majority of the Project Area consists of an active waterfront and includes fishing vessels, recreational vessels and docks, and ferry terminals. The Port implements maintenance dredging within the Project Area in multiple locations. The Project Area supports a high concentration of visitor-related commercial development (shops and restaurants). The shoreline is well-developed with commercial areas including parking lots, hotels, shops, restaurants, and recreational grass/park areas.

Piers support the following uses with the Project Area boundaries:

- Pier 43½ is the westernmost structure within the Project Area. The Red and White Fleet operates landside concessions and provides sightseeing Bay cruises from Pier 43 ½ with several cruises daily.

- The Pier 43 Ferry Arch/Car Ferry Headhouse is a historic resource within the Port of San Francisco Embarcadero Historic District (P-38-004890) and a contributing resource to the namesake National Register of Historic Places District # 06000372.

- Pier 41½ is the central structure within the Project Area. From this pier, the Blue & Gold Fleet provides regular ferry service to Sausalito, Tiburon, and Angel Island, and through its contract with the Water Emergency Transportation Authority, service to Vallejo, Alameda/Oakland, Harbor Bay, South San Francisco, and Richmond. There are several departures per day. Pier 39 is a 45-acre waterfront complex with about 15 million visitors annually. It currently houses 14 full-service restaurants, 90+ retail shops, and attractions including the Aquarium of the Bay, a 5-acre waterfront park, and a 300-berth small craft marina. The Pier 39 West Basin supports the following uses:
  - The Blue & Gold Fleet operates cruise routes from the Pier 39 West Basin, providing sightseeing Bay cruises with several daily departures.
  - A resident population of California sea lions (*Zalophus californianus*) centers around the K Dock; the population ranges from several dozen individuals to over 1,700 observed at one time.
  - San Francisco Bay Boat Cruises Inc. is based out of I Dock and offers wine tasting tours and other excursions.
  - J Dock is home to seasonal commercial business including Adventure Cat, a charter sailing company that offers up to three sailing trips per day, plus additional private charters.
  - The Pier 39 West Basin also hosts guest docking of boats up to 60 feet long and a small number of liveaboard boats.
- The Pier 39 East Basin supports the following uses:
  - The Pier 39 East Basin leases long-term and visitor tenant boat slips, accommodating boats up to 85 feet long. There are a small number of liveaboard boat residents as well.
  - A Dock houses San Francisco Whale Tours and Empress Events luxury charter cruises. The easternmost pier at A Dock houses the America's Cup sailboat, which offers public and private charters from February through November.
  - B and C Docks host Emerald Lady and Bay Voyager excursions, which operate year-round when possible. A water taxi concession serves passengers throughout the day at B Dock.
  - F Dock hosts San Francisco Sailing Company, a sailing school and charter company with numerous boats operating year-round.

3.3.1 Physical Setting

The Project Area is primarily subtidal habitat characterized by open water and a soft sediment seafloor. The Project Area also contains hard substrate consisting primarily of constructed hard substrates including submerged concrete breakwater, bulkheads, vessel structures, pilings, riprap, and pipelines. The largest tidal fluctuations along the northern waterfront are from approximately

−1.5 to +7.0 feet mean low lower water (MLLW), but typical daily tidal variations are about half as large. The offshore area exhibits varying mudline elevations depending on currents, sedimentation rates, and vessel activities. Maintenance dredging is performed in portions of the Project Area every 3 to 5 years to ensure safe navigation for vessels. Depressions resulting from propeller wash ("scour areas") are found in four locations: within the southwest corner of the Pier 39 West Basin where the Blue & Gold Fleet excursion vessels berth, at Pier 41½ where the Blue & Gold Fleet vessels berth, at Pier 43½where the Red and White Fleet vessels berth, and on the eastern edge of the Pier 39 East Basin (near the entrance to that marina).

Multi-beam bathymetric surveys show debris (e.g., wood, concrete, broken piles, metallic items, and unidentifiable objects) on the seafloor across the Project Area with the highest density located within the footprint of the former Pier 43, which was demolished by the Port between 2011 and 2012 (Haley & Aldrich 2020b). In addition, unidentifiable objects are located farther offshore and closer to the Fisherman's Pier, near shore within the Pier 39 West Basin, and within the footprint of the former Pier 37 within the Pier 39 East Basin.

The Remedial Investigation Report confirmed that, except for the shoreline riprap and the debris mentioned above, the Project Area sediments are composed of silt with varying amounts of sand and clay, consistent with the ubiquitous bay mud found throughout the Bay (Haley & Aldrich 2020b). The sediment at the mudline is generally soft with high water content; however, with depth (approximately 2 to 3 feet below mudline), the sediment is more consolidated. Porosity and permeability generally decrease with depth below mudline.

As required by Port maintenance dredge permits, the berth at Pier 96 is maintained at a depth of -35 feet MLLW to allow vessel berthing, loading, and unloading. The Port of Oakland's Berth 10 is authorized to be maintained at a depth of –50 feet MLLW according to the Oakland Harbor Navigation Improvement Project (USACE 2020).

3.3.2 Urban Land

All wharves and pile-supported structures within the Project Area (approximately 3.1 acres) support urban development, which is classified as urban land by the California Wildlife Habitat Relationships System (Figure 7). Urban areas typically have a small diversity of trees, shrubs, and grasses but greater productivity than natural grasslands due to abundant water and fertilizer (McBride and Reid 1988).

The original shoreline has been modified significantly by more than a century of fill and development. Most of the Project Area is paved hardscape with ornamental plantings. While much of the urban land within the Project Area is concrete paved walkways or wooden piers, urban vegetation is present within the planting strips and lawns along The Embarcadero pedestrian walkway. The urban vegetation is primarily limited to ornamental plantings or ruderal species. Planting strips are located throughout the urban portions of the Project Area and are lined with ornamental shrubs and filled with various, often seasonally changing, ornamental herbaceous plantings. Various ornamental trees occur adjacent to the commercial buildings and along the perimeters of the planting strips. In addition, two lawns occur along the southern Project Area boundary.

3.3.3 Offshore Areas

The approximately 47-acre Project Area, which includes the five remedial response areas, is entirely within jurisdictional waters of the U.S./State (WOTUS). The southern Project Area boundary is defined by a concrete seawall, which generally coincides with the high tide line and mean high water. Subtidal and intertidal zones occur within the offshore areas.

The open waters of the Central Bay are inhabited by more than 30 species of pelagic fish (IEP 2009) and 7 species of marine mammals. Prevalent species in the Central Bay that are likely to occur in the Project Area include Northern anchovy (*Engraulis mordax*), jacksmelt (*Atherinopsis californiensis*), Bay goby (*Lepidogobius lepidus*), English sole (Parophrys vetulus), speckled sanddab (*Citharichthys stigmaeus*), plainfin midshipmen (*Porichthys notatus*), Pacific staghorn sculpin (*Leptocottus armatus*), shiner perch (*Cymatogaster aggregata*), cheekspot goby (*llypnus gilberti*), white croaker (*Genyonemus lineatus*), bonyhead sculpin (*Artedius notospilotus*), Pacific sandab (*Citharichthys sordidus*), and Bay pipefish (*Syngnathus leptorhynchus*). California sea lions are now a mainstay on K Dock in the Pier 39 West Basin. Hard bottom substrates in the Central Bay are typically covered with a mixture of sessile epibenthic organisms dominated by algae, mussels, chitons, limpets, barnacles, oysters, sea stars, hydroids, bryozoans, tunicates, encrusting sponges, encrusting diatoms, and anemones (Hieb 1999).

3.3.3.1 Intertidal Zone

The intertidal zone is the area of shoreline that is between the high and low tide (above water at low tide and below water at high tide). Intertidal habitat within the Project Area is entirely composed of constructed features associated with the seawall and piers, including riprap, pier support piles, the undersides of the piers, seawalls, and the breakwater are all within the boundaries of the Project Area.. Within the Project Area, intertidal zone hardscape consists primarily of constructed hard manmade surfaces including submerged concrete breakwater, bulkheads, vessel structures, pilings, riprap, and pipelines. Due to the restrictive substrate (both in surface area and slope) for algal and animal attachment, the intertidal portion of the Project Area is populated with a variety of algae and sessile organisms (discussed above). These hard surfaces provide reduced refugia and foraging opportunities for fishes and mobile invertebrates like crabs compared to naturally occurring hard bottom substrates.

3.3.3.2 Subtidal Zone

The Project Area is primarily subtidal habitat characterized by open water and a soft sediment seafloor. The subtidal zone is the area below the low tide line (below water at low tide). The subtidal zone can be further broken into seafloor habitat and open water habitat. Constructed, hardscapes like pier piles and docks are also located in the subtidal zone. The predominant seafloor habitat found throughout the subtidal zone is unconsolidated soft sediment composed primarily of bay mud, with minor amounts of sand, and pebble/cobble, and shell mix. Organisms that inhabit the soft bottom environment of both deep and shallow water regions in the Central Bay include mobile invertebrates that use this portion of the Bay as an extension of their coastal habitat. Common species within Central Bay soft sediment habitats include algae and submerged aquatic vegetation as well as a wide variety of demersal fish (IEP 2009), and a variety of deposit and filter feeding invertebrates, including a diverse community of polychaetes, crustaceans (including shrimp, crabs, and amphipods), and bivalves (NOAA Fisheries 2007; Thompson et al. 2007). The open water habitat within the subtidal zone is often occupied by mobile species including a variety of fishes, water birds, and marine mammals, as well as planktonic species and life stages of local fish and invertebrates. Constructed hard surface substrates in the subtidal zone are used as anchorages by seaweeds and invertebrate filter feeders like barnacles and mussels.

3.3.3.3 Benthic Habitat Conditions

A sediment profile and plan view imaging (collectively referred to as SPI/PV) survey was conducted at 100 stations within the Project Area in January 2018 to characterize the physical and biological conditions of the surficial sediments in the area (Haley & Aldrich 2018). In March of 2019, a multibeam, mobile LiDAR, and sub-bottom profiling was also used to map prominent geophysical characteristics, including areas of vessel scour (e.g., scour within ferry berthing areas, sloughing/scour at entrance to the Pier 39 East Basin). In addition, photoreconnaissance and probing supplemented the studies to characterize Bay floor conditions. Data collected as a part of these efforts was used to create a benthic habitat map which can be used to assess the quality of the benthos (Figure 8). The analysis identified three categories of substrates within the remedial footprint.

Hardscape considered unsuitable habitat for infaunal organisms (1.6 acres)

These areas consist of cobbles, boulders, and riprap and lacked sediment accumulation. The largest contiguous area of hardscape appears just beyond Pier 43 ½ near the shoreline. This debris appears to be remnant material from the former pier. Although rock and hardscape provide habitat for epifaunal species such as sponges and may provide beneficial habitat complexity for fish and mobile invertebrates, such as crabs, currently these areas consist of non-native debris, shoreline stabilization materials such as riprap, or cobble exposed by scour. Based on SPI/PV analysis these areas were considered unsuitable habitat for infaunal organisms.

Softscape with physical disturbance (2.7 acres)

These areas primarily occur where the sediment–water interface is routinely disturbed by vessel traffic or wave action. Nearly all of which are located within areas with high vessel traffic and are within the bottom of and along the edges of scour areas. These areas maintain a sediment profile with a thin or recently disturbed apparent redox potential discontinuity (aRPD). The aRPD value indicates the depth at which the sediment transitions from being oxidized to reduced is useful in assessing the quality of a habitat for epifauna and infauna from both physical and biological points of view. The aRPD depth in profile images have been shown to be directly correlated to the quality of the benthic habitat. Advanced infaunal successional stages were observed; however, most activity occurred at depths below the disturbed layer. As such, these areas appear to provide marginal foraging habitat, as benthic development is impeded by frequent disturbance.

Softscape with minimal physical disturbance (showing benthic colonization) (5.5 acres)

These areas are primarily within areas protected by breakwaters and where smaller vessels operate at slower speeds, such as in the Pier 39 East Basin. These areas maintain a sediment profile with moderately deep aRPDs. Advanced infaunal successional stages were observed throughout the profiles. These areas also support surface tubicolous infauna that provide for increased secondary production and, thus, provide higher quality foraging habitat for various fish species.

SECTION 4. POTENTIAL IMPACTS TO SPECIAL-STATUS SPECIES

4.1 Applicable Laws

Special-status species include species considered to be rare by federal and/or state resource agencies (USFWS, NMFS, CDFW) and/or the scientific community (CNPS) and are accordingly legally protected via the federal, state, and/or local laws described below.

4.1.1 Federal Endangered Species Act (FESA)

The FESA prohibits the "take" of any wildlife species listed by the USFWS or NMFS as threatened or endangered, including the destruction of habitat that could hinder species recovery. The USFWS and NMFS oversee the implementation of FESA (50 Code of Federal Regulations (CFR) § 402.7, Section 305(b)(4)(B)) and have regulatory authority over listed plants, wildlife, and fish. When species are listed as endangered or threatened under FESA, the federal government is also directed to designate critical habitat for these species. To remain compliant with the FESA, federal agencies, such as USACE, are required to consult with the resource agencies prior to issuance of a permit if a project may adversely affect a federally listed species. If USACE is able to determine the project would have no effect on a listed species (when there is no potential for presence of a listed species), no additional consultation is required.

The USFWS and NMFS administer the FESA and authorize exceptions to the take provisions through issuance of Biological Opinions in consultation with the federal action agency (e.g., USACE or the Federal Emergency Management Agency). The USFWS has primary responsibility for terrestrial and freshwater organisms, whereas the responsibilities of the NMFS are mainly marine wildlife, such as whales, and anadromous fish, such as salmon.

4.1.2 Migratory Bird Treaty Act (MBTA)

The MBTA of 1918 (16 United States Code (U.S.C.) 703-712; Ch. 128; July 13, 1918; 40 Stat. 755; as amended in 1936; 1960, 1968, 1969, 1974, 1978, 1986, and 1998) (between the United States, Canada, Mexico, and Japan) prohibits the take (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct) of any migratory bird or any part, nest, or egg of any such bird. The USFWS issues permits for take of migratory birds related to scientific collecting, banding and marking, falconry, raptor propagation, depredation, import, export, taxidermy, waterfowl sale and disposal, and special purposes.

4.1.3 Marine Mammal Protection Act (MMPA)

The MMPA establishes a federal responsibility to conserve marine mammals, with management vested in the Department of Commerce (NOAA) for cetaceans (whales, dolphins, and porpoises) and pinnipeds (seals and sea lions) (with the exception of walrus) and the Department of the Interior (USFWS) for all other marine mammals. The MMPA of 1972 prohibits the "take" of any marine mammal (including cetaceans, pinnipeds, sirenians [manatees and dugongs], sea otters, and polar bears) within U.S. waters and/or by U.S. citizens on the high seas, as well as the importation of marine mammals and marine mammal products into the U.S. Pursuant to the MMPA, "take" is defined as the act of hunting, killing, capture, and/or harassment of any marine mammal, or the attempt at such.

Protections afforded by the MMPA extend to species without listing under the FESA or the California Endangered Species Act (CESA). Exceptions are established for incidental take of small numbers of marine mammals where the take would be limited to harassment. An authorization for incidental take of marine mammals is called an Incidental Harassment Authorization (IHA) or Letter of Authorization (LOA).

Under the 1994 Amendment to the MMPA, harassment is statutorily defined as "any act of pursuit, torment, or annoyance which has the potential to injure or disturb a marine mammal or marine mammal stock in the wild." Harassment that has the potential to injure a marine mammal is further defined as Level A harassment. Harassment that has the potential to disturb a marine mammal by disrupting behavioral patterns, including but not limited to migration, breathing, nursing, breeding, feeding, or sheltering, but does not have the potential to injure a marine mammal, is defined as Level B harassment.

4.1.4 California Endangered Species Act (CESA)

The CESA prohibits the "take" of any wildlife species listed as endangered and threatened by the State of California. Section 2090 of the CESA requires state agencies to comply with regulations for protection and recovery of listed species and to promote conservation of these species. CDFW administers the CESA and authorizes exceptions to the take provisions through Section 2081 agreements (Incidental Take Permits [ITPs]) (except for designated "fully protected species"). Regarding rare plant species, the CESA defers to the California Native Plant Protection Act of 1977. Species that the California Fish and Game Commission has noticed as being under review for listing by CDFW are likewise given full CESA protection.

4.1.5 California Native Plant Protection Act and California Fish and Game Code (Plants)

The CNPS designates California Rare Plants through a ranking system. Ranks 1A, 1B, and 2 meet the definitions established in Section 1901, Chapter 10 (Native Plant Protection Act of 1977) or Sections 2062 and 2067 of the CESA and are eligible for state listing. Some Rank 3 and 4 plants may fall under Section 15380 of the CEQA Guidelines.

4.1.6 California Fish and Game Code (Fully Protected Species)

The State of California designated 37 species of wildlife that were rare or faced possible extinction with the classification of Fully Protected in the 1960s to provide additional protection to those species. To provide additional protections for wildlife that is rare or faces potential extinction, California Fish and Game Code Sections 3511, 4700, 5050, and 5515 designate "fully protected" status for specific birds, mammals, reptiles, amphibians, and fish. Fully protected species cannot be taken or possessed at any time and no licenses or permits can be issued for their take. Exceptions are established for scientific research collection, relocation of the bird species for the protection of livestock, and take resulting from recovery activities for state-listed species.

4.1.7 California Fish and Game Code (Birds)

California Fish and Game Code Section 3503 prohibits the take of nest or eggs of any bird. Raptors and other fully protected bird species are further protected in Sections 3503.5 and 3511, which state that these species or parts thereof may not be taken or possessed at any time.

4.1.8 California Fish and Game Code (Marine Mammals)

Section 4500 of the California Fish and Game Code addresses take of marine mammals, stating that it is unlawful to take any marine mammal except in accordance with provisions of the MMPA of 1972 or provisions of Title 50 of the Code of Federal Regulations or pursuant to subdivision (b) of Section 4500.

4.1.9 California Fish and Game Code (Pacific Herring)

Sections 8550–8559 of the California Fish and Game Code establish regulations to protect spawning herring. CDFW limits any type of in-water work that may affect schools of herring or spawning herring during the spawning season from December 1 to March 15.

4.1.10 California Fish and Game Code (Dungeness Crab)

Section 8278 of the California Fish and Game Code states that no Dungeness crab females or juveniles less than 6¼ inches in breadth may be taken, possessed, bought, or sold.

4.1.11 CDFW Species of Special Concern

A species of special concern is an administrative designation given by CDFW to a native species that meets one or more of the following criteria: is extirpated from the state; is federally (but not state) listed; is experiencing, or formerly experienced, population declines or range restrictions; or has naturally small populations at high risk of declines. While this designation carries no legal status, CEQA Guidelines Section 15380 clearly indicates that species of special concern should be included in an analysis of project impacts.

4.2 Methodology

Information about special status species that could occur within the Project Area was obtained from the following sources:

- CNDDB RareFind 5 (CDFW 2019; CDFW 2020)
- CNPS Inventory of Rare, Threatened, and Endangered Plants of California (CNPS 2020)
- NMFS Listed Species, Critical Habitat, EFH, and MMPA species lists (NOAA 2016)
- USFWS IPaC resource list report (USFWS 2019)
- Existing literature as cited in the text

The NOAA Fisheries Listed Species, Critical Habitat, EFH, and MMPA species data were used to query all federally endangered, threatened, candidate, and proposed fish species in the San Francisco North, Point Bonita, San Quentin, Oakland West, and San Francisco South quadrangles. In addition, the CNDDB was used to query all special-status species with known occurrences within a 3-mile radius surrounding the Project Area. A query of the CNPS Inventory of Rare, Threatened, and Endangered

Plants of California was conducted for state and federally listed and candidate species, as well as CNPS-ranked species known to occur on the same quadrangle as the Project Area (San Francisco North), to determine additional special-status plants with potential to occur within the Project Area.

The species identified in these searches were compiled in tables (Appendix A) and evaluated for likelihood of occurrence within the Project Area. The potential for species to be adversely affected by the Project was classified as high, moderate, low, or none using the following definitions:

- **High**: The potential for a species to occur was considered high when the Project Area was located within the range of the species, recorded observations were identified within known dispersal distance of the Project Area, and suitable habitat was present within the Project Area.
- **Moderate**: The potential for a species to occur was considered moderate when the Project Area was located within the range of the species, recorded observations were identified nearby but outside known dispersal distance of the Project Area, and suitable habitat was present within the Project Area. A moderate classification was also assigned when recorded observations were identified within known dispersal distance of the Project Area but habitat within the Project Area was of limited or marginal quality.
- **Low**: The potential for a species to be adversely affected was considered low when the Project Area was within the range of the species, but no recorded observations within known dispersal distance were identified, and habitat within the Project Area was limited or of marginal quality. The potential for adverse effects was also classified as low when the Project Area was located at the edge of a species' range and recorded observations were extremely rare, but habitat in the Project Area was suitable.
- **None**: The potential for a species to be adversely affected was considered none when a species was not expected to occur within or adjacent to the Project Area.

4.3 Special-Status Plants in Vicinity of Project Area

According to the CNDDB, the CNPS Inventory of Rare, Threatened, and Endangered Plants of California, and the USFWS IPac tool, a total of 42 special-status plant species are known to occur in the vicinity of the Project Area. All of these species require specialized habitats that *do not* occur within the Project Area's urban and offshore vegetation communities, including coastal prairie, coastal scrub, coastal dunes, valley and foothill grassland, coniferous forest, broadleafed upland forest, chaparral, meadows and seeps, marshes and swamps, playas, and vernal pools. Accordingly, implementation of the Project would not result any impacts on special-status plant species. A brief description of each of these species is included within Appendix A (Table 1), including the species' status, habitat, and probability of occurring within the Project Area.

4.4 Special-Status Wildlife in Vicinity of Project Area

According to the CNDDB, the USFWS IPac tool, the NMFS West Coast Region California Species List for San Francisco North Quad, personal observation, and existing literature, a total of 55 special-status wildlife species and/or subspecies are known to occur in the vicinity of the Project Area or have ranges that overlap with the Project Area. A brief description of each of these species is included in Appendix A (Table 2), including the species' status, habitat, and probability of occurring within the Project Area.

4.4.1 Special-Status Wildlife Not Expected to Occur within Project Area

Due to lack of suitable habitat and/or lack of range overlap, 31 of the regionally known special-status wildlife species and/or subspecies identified as occurring in the vicinity of the Project Area are not expected to occur within the Project Area.

4.4.1.1 Lack of Suitable Habitat

As the Project Area is located entirely within offshore and urban habitats within or adjacent to the Bay, the regionally known special-status terrestrial and semi-aquatic (freshwater) species (American badger [*Taxidea taxus*], bay checkerspot butterfly [*Euphydryas editha bayensis*], California red-legged frog [*Rana draytonii*], Callippe silverspot butterfly [*Speyeria callippe callippe*], mission blue butterfly [*Icaricia icarioides missionensis*], monarch butterfly [*Danaus plexippus plexippus*], salt-marsh harvest mouse [*Reithrodontomys raviventris raviventris*], and San Bruno elfin butterfly [*Callophrys mossii bayensis*]) are not expected to occur within the Project Area. Further, due to the Project Area's location within or adjacent to a heavily trafficked port with insufficient roosting or nesting habitat in close proximity, regionally known special-status birds (American peregrine falcon [*Falco peregrinus anatum*], California black rail [*Laterallus jamaicensis coturniculus*], California least tern [*Sterna antillarum browni*], Ridgway's rail [*Rallus obsoletus*], short-tailed albatross [*Phoebastria albatrus*], and western snowy plover [*Charadrius nivosus nivosus*]) are likewise not expected to occur within or near the Project Area.

4.4.1.2 Species Range Does Not Include San Francisco Bay and/or Overlap with Project Area

While black abalone [*Haliotis cracherodii*], blue whale [*Balaenoptera musculus*], fin whale [*Balaenoptera physalus*], Guadalupe fur seal [*Arctocephalus townsendii*], killer whale [*Orcinus orca*], North Pacific right whale [*Eubalaena japonica*], Sei whale [*Balaenoptera borealis*], southern sea otter [*Enhydra lutris nereis*], and sperm whale [*Physeter macrocephalus*], and the four regionally known sea turtle species (green sea turtle [*Chelonia mydas*], leatherback sea turtle [*Dermochelys coriacea*], North Pacific loggerhead sea turtle [*Caretta caretta*], and olive Ridley sea turtle [*Lepidochelys olivacea*]) have been identified as species of concern for the San Francisco North quad, these species are not known to occur within the Bay. Similarly, while delta smelt (*Hypomesus transpacificus*) are known to occur within the San Francisco Estuary, this species is restricted to the upper estuary including Suisun Bay and upstream within the Sacramento River. Accordingly, these species are not expected to occur within or near the Project Area.

4.4.1.3 Species Considered Extirpated from San Francisco Bay

Tidewater goby (*Eucyclogobius newberryi*) and coho salmon (*Oncorhynchus kisutch)* are considered to be extirpated from the Bay and would accordingly not be expected to occur within or near the Project Area.

4.4.2 Special-Status Wildlife with Potential to Occur within Project Area

The remaining 25 regionally known special-status species and/or subspecies and MBTA-protected birds have the potential to occur within the Project Area. These species are further discussed in the following sections.

Table 2. Special-Status Wildlife Species with Potential to Occur in Project Area

Common Name	Seasonality	Status Code[1]
MARINE MAMMALS		
Pacific harbor seal	Present year-round	MMPA
Steller sea lion - eastern Distinct Population Segment (DPS)	Mid-May to mid-July	MMPA
California sea lion	Present year-round	MMPA
Northern elephant seal	mid-February–June 30	MMPA
Northern fur seal	Extralimital species	MMPA
Harbor porpoise	Present year-round	MMPA
Common bottlenose dolphin	Present year-round	MMPA
Gray whale	Late winter/early spring	FE, MMPA
Humpback whale	April–November	FE, MMPA
BIRDS		
Migratory birds (nesting)	Nest February 1–August 31	MBTA
INVERTEBRATES		
Benthic invertebrates	Present year-round	MSA
Dungeness crab	May 1–June 30	CDFW Managed
FISH		
Green sturgeon – southern DPS	Present in low numbers year-round	FT
Steelhead trout – Central California Coast DPS	December–May	FT
Steelhead trout – California Central Valley DPS	December–May	FT
Chinook salmon – Central Valley Spring Run Evolutionarily Significant Unit (ESU)	December–May	FT, ST
Chinook salmon – Sacramento River Winter Run ESU	December - May	FE, SE

Common Name	Seasonality	Status Code[1]
Chinook salmon – Central Valley Fall-run and late-fall-run ESU	July - April	SSC
MSA managed fish	Variable depending on species	MSA Managed
Longfin smelt	Present in low numbers year-round	FC, ST
Pacific herring	Present year-round	MSA/CDFW Managed

Notes:
[1]Legal status codes are as follows:
CDFW Managed = managed by California Department of Fish and Wildlife
FC = federal candidate species
FE = federally listed as endangered
FT = federally listed as threatened
MMPA = Marine Mammal Protection Act
MSA Managed = Magnuson-Stevens Fishery Conservation and Management Act
SE = state-listed as endangered
ST = state-listed as threatened
SSC = state species of concern

[2]MSA managed fish in the vicinity of the Project Area include English Sole, Jacksmelt, Northern Anchovy, Olympia Oyster, Pacific (chub) Mackerel, Pacific Jack Mackerel, and Pacific Sardine

4.5 Impact Assessment

4.5.1 Marine Mammals

Three marine mammal species have been documented within the Project Area including California sea lion (MMPA Protected Species), Pacific harbor seal (*Phoca vitulina*) (MMPA Protected Species), and Steller sea lion (eastern DPS) (*Eumetopias jubatus*) (MMPA Protected, Depleted, and Strategic). A resident population of California sea lions occurs within the Project Area boundaries, primarily centered around K Dock (Pier 39 West Basin) with numbers reaching as high as 1,701 individuals observed at once (November 2009). While Pacific harbor seals are less common, they are routinely observed within the Project Area. Pacific harbor seals and eastern DPS Steller sea lions are rarely documented visitors to K Dock. Marine mammals occasionally also use docks within the Area E (East basin) for haul-outs. No other marine mammals have been recorded within the Project Area boundaries; however, due to the Project Area's location along the margins of the Central Bay, other protected marine mammal species that have a low likelihood of occurring within the Project Area include common bottlenose dolphin (*Tursiops truncates*), gray whale (*Eschrichtius robustus*), harbor porpoise (*Phocoena phocoena*), humpback whale (*Megaptera novaeangliae*), northern elephant seal (*Mirounga angustirostris*), and northern fur seal (*Callorhinus ursinus*).

Marine mammals rely on sound for foraging, navigating, and communicating, and are sensitive to noise-related effects generated by construction activities. Project-related activities that have the potential to result in the incidental harassment of marine mammals due to elevated in-water and/or airborne sound levels include dredging and debris removal, capping/armoring, test borings (for geotechnical investigation), and pile installation (for turbidity curtain installation, temporary dock relocation, and slope stabilization) and removal. Dredging operations may produce noise of a sufficient level to behaviorally harass marine mammals (in the form of short-term reactions such as startle or alert reactions) at K Dock. Vibratory pile driving produces non-impulse (continuous) noise that can cause behavioral disturbance in marine mammals and a temporary threshold shift (TTS) in an animal's hearing. Both behavioral disturbance and TTS are considered Level B harassment. At very close ranges, these non-impulse sounds from vibratory pile driving can also cause slight injury in the form of permanent threshold shift (PTS) in an animal's hearing, which is a form of Level A harassment. Pile proofing, which is short-duration impact pile driving, produces impulse sounds that can cause behavioral disturbance and TTS in marine mammals (Level B harassment) and slight injury in the form of PTS in an animal's hearing (Level A harassment). General in-water work activities, including placement of armoring, can also result in harassment of marine mammals.

NMFS has established sound threshold criteria for behavioral disturbance (Level B harassment) and PTS (Level A harassment) to marine mammals from pile driving and other construction activities. The underwater sound pressure threshold for Level B harassment is 120 dB Root Mean Square (RMS) for non-impulse sound (e.g., drilling, or vibratory pile installation) and 160 dB RMS for impulse sound (e.g., impact/drop hammer) for all marine mammal species (Table 4). The underwater sound pressure threshold for Level A harassment is a dual metric criterion, including both a peak pressure and cumulative SEL (SELcum) threshold that is specific to the species hearing group (i.e., high-frequency (HF) cetaceans, mid-frequency (MF) cetaceans, low-frequency (LF) cetaceans, phocids, and otariids). The airborne sound pressure threshold for Level B harassment of all activities is 90 dB root mean square (RMS; unweighted) for Pacific harbor seals, and 100 dB RMS (unweighted) for California sea lions and other pinnipeds (re: 20 μPa^2sec).

Table 3. Example Underwater Sound Thresholds

<table>
<tr><th rowspan="3">Species Hearing Group</th><th colspan="2">Continuous Sound (Drilling)</th><th colspan="3">Impulse Sound (Impact)</th></tr>
<tr><th rowspan="2">Level B (dB RMS)</th><th rowspan="2">Level A (dB SELcum)</th><th rowspan="2">Level B (dB RMS)</th><th colspan="2">Level A Dual Criteria</th></tr>
<tr><th>(dB Peak SPL)</th><th>(dB SELcum)</th></tr>
<tr><td>High-frequency Cetaceans (HF)
(e.g., harbor porpoise)</td><td rowspan="5">120</td><td>173</td><td rowspan="5">160</td><td>202</td><td>155</td></tr>
<tr><td>Mid-frequency Cetaceans (MF)
(e.g., bottlenose dolphin)</td><td>198</td><td>230</td><td>185</td></tr>
<tr><td>Low-frequency Cetaceans (LF)
(e.g., humpback whale, gray whale)</td><td>199</td><td>219</td><td>183</td></tr>
<tr><td>Phocids
(e.g., harbor seal, northern elephant seal)</td><td>201</td><td>218</td><td>185</td></tr>
<tr><td>Otariids (OW)
(e.g., California sea lion, Steller sea lion, northern fur seal)</td><td>219</td><td>232</td><td>203</td></tr>
</table>

Note: All decibels (dB) are referenced to 1 micro Pascal (re 1 μPa).

Source: NMFS 2018

In addition, temporary dock relocation during dredging would make the haul-outs locations temporarily unavailable, but structures throughout the waterfront would continue to be available and the marine mammals would temporarily relocate to an adjacent structure. Turbidity curtains generally do not affect marine mammal access to the waterfront or preclude their mobility.

Protected marine mammals could be affected as a result of Project implementation. These impacts can be reduced to a level considered less than significant with implementation of compliance and monitoring plans, and AMMs presented in Section 7.

4.5.2 Fish

Five state and/or federally listed fish species are known to occur within the Bay and have potential to occur within the Project Area: Chinook salmon (*Oncorhynchus tshawytscha*) (Central Valley Spring Run, Sacramento River Winter Run, and Central Valley Fall-run and late-fall-run Evolutionarily Significant Units [ESUs]), green sturgeon (*Acipenser medirostris*) (Southern Distinct Population Segment [DPS]), longfin smelt (*Spirinchus thaleichthys*), Pacific herring (*Clupea pallasii*), and steelhead trout (*Oncorhynchus mykiss*) (California Central Valley and Central California Coast DPS). The Central Bay is designated as critical habitat for green sturgeon, steelhead trout, and Chinook salmon. In addition, the Bay waters within the Project Area are classified as EFH for species managed under the Pacific Coast Salmon FMP (coho and Chinook salmon) and also for species managed under the Coastal Pelagic Species FMP, Pacific Coast Groundfish FMP, and Highly Migratory Species FMP. Fish species that are not state or federally listed, but managed under the above FMPs and the MSA, that may occur in the Project Area include English sole (*Parophrys vetulus*), jacksmelt (*Atherinopsis californiensis*), northern anchovy (*Engraulis mordax*), Pacific (chub) mackerel (*Scomber japonicus*), Pacific herring (*Clupea pallasii*), Pacific jack mackerel (*Trachurus symmetricus*), and Pacific sardine (*Sardinops sagax*). As the Project Area is located along the margins of the Central Bay, presence of these fish cannot be ruled out. However, with the exception of Pacific herring, the probability of presence of these species is low due to the marginal habitat quality and the location of the Project Area along the margins of the Central Bay.

Project activities that may impact protected fish include elevated underwater noise, increased turbidity, and fish entrainment. Green sturgeon, longfin smelt, and Pacific herring are the only protected fish species that have the potential to be present within the Bay year-round. While green sturgeon and longfin smelt may occur within the deeper waters of the Central Bay year-round, they spawn primarily in freshwater in the lower reaches of the Sacramento River and San Joaquin River. It is unlikely that these species would routinely enter the Project Area to forage; however, it is possible that these species could be found within the Project Area boundaries as individuals migrate through the Golden Gate.

Pacific herring have historically spawned along the San Francisco waterfront annually in the winter months, and CDFW prohibits most in-water work associated with vibratory or impact hammer pile installation during the December 1 to March 15 spawning season. Chinook salmon and steelhead trout are present in the Bay only during migratory periods, either when adults migrate from the ocean to upstream freshwater breeding habitat or when juveniles out-migrate from natal streams to the ocean. Due to the timing of migrations through the Bay, these species are absent from the Bay from June through November. As such, NOAA Fisheries and CDFW limit in-water construction activities that may adversely affect these species to a work window of June 1 to November 30 when Chinook salmon and steelhead trout are generally absent from the Bay. In-water construction activities restricted to this window may include impact pile driving, cap installation in some areas, and dredging. Some in-water construction activities (e.g., removing, relocating, or replacing docks and other infrastructure) can be conducted year-round and are not subject to work window restrictions. Activities that are not restricted to the salmonid work window may be subject to herring spawning in-water work restrictions from December 1 to March 15.

Increased underwater noise can occur during pile installation, removal, or proofing (i.e., short-duration impact pile driving). Impact pile driving introduces impulsive sound into the water column that can result in pressure changes that can potentially cause injury to fish. However, studies assessing underwater sound levels associated with vibratory hammer methods for pile installation projects in the Bay have demonstrated that use of vibratory hammers to install piles (Buehler et al. 2015) does not present a risk of physical injury or mortality to fish. Regardless, as vibratory pile driving may impact herring spawning activities, it is not permitted during herring spawning season (December 1 to March 15).

Increased turbidity, as a result of disturbance of bottom sediments during project construction and dredging activities, affects fish species in several ways. Elevated turbidity in the water column during dredging, cap/armor installation, and pile driving/removal can reduce dissolved oxygen levels and affect gill function, reducing respiratory functions. Turbidity can disrupt normal feeding behavior, consequently decreasing growth rates. Dredging operations can also result in entrainment of fish and minor underwater sound alterations; underwater sound produced by dredging is not expected to reach levels higher than the existing ambient levels resulting from the steady marina traffic. Finally, placement of capping material can reduce food supplies for fish, although current contaminated sediment provides a reduced-quality food source.

Most disposal of dredged sediments is proposed to occur at an upland facility and would therefore not affect fish. A portion of sediment, if determined suitable, may be disposed at SF-DODS. This disposal site is located approximately 50 miles offshore from the Golden Gate in the Pacific Ocean, with water depths of approximately 10,000 feet where anadromous salmonids and green sturgeon are not expected to be present.

In-water Project-related construction activities (e.g., pile installation/removal, dredging, capping/armoring) have the potential to affect Pacific herring during spawning events. Adult herring spawn in the Bay from December through March, with peak spawning occurring in January. Dredging and pile driving activities result in increased suspended sediment, which can lead to sublethal and lethal effects on herring embryos after a spawning event.

Project implementation could lead to impacts on special-status fish species. These impacts can be reduced to a level considered less than significant with implementation of compliance and monitoring plans and AMMs as well as Mitigation Measure BIO-1 presented in Section 7, below.

4.5.3 Birds

The open waters of the Bay act as a plentiful feeding ground for diving birds (which feed on benthic invertebrates in deeper water), dabblers (which feed in the upper water column of shallow subtidal areas), and piscivores (which feed on fish). Special-status birds known to forage within the Central Bay are not expected to occur within the Project Area due to the heavily trafficked marina setting and resulting marginal quality of foraging habitat. In addition, regional known special-status birds such as American peregrine falcon (*Falco peregrinus anatum*) have not been known to forage or nest within or near the Project Area.

It is of note, however, that the onshore and in-water structures and trees/shrubs occurring within and adjacent to the Project Area provide suitable roosting and nesting substrate for urban-adapted birds. The trees and shrubs within or adjacent to the Project Area provide suitable nesting habitat for passerines, and the structures within or adjacent the Project Area provide suitable nesting habitat for scrape-nesting birds such as the western gull (*Larus occidentalis*), which was observed atop the Pier 45 structure exhibiting nesting behavior during the August 2019 site visit. Vessels used to operate dredging and pile driving equipment would also provide suitable nesting substrate for scrape- and cavity-nesting birds (species such as black oystercatchers [*Haematopus bachmani*], pigeon guillemot [*Cepphus columba*], and western gull are known to nest on vessels within the Bay).

Other regionally known scrape-nesting birds, such as double-crested cormorant (*Phalacrocorax auritus*), would not be species of concern within the Project Area, as double-crested cormorant are colonial nesters with nesting colonies in established locations (e.g., under the East Span of the San Francisco-Oakland Bay Bridge).

While it is unlikely that the Project would result in take of individual birds, active nests (i.e., nests with viable eggs and/or chicks) may be affected by Project-related activities that result in nest abandonment or destruction. Active nests on landside structures and vegetation may be affected by staging or material handling activities; however, birds nesting on landside or marine structures and vegetation are likely habituated to the current high levels of local traffic and other activity (from watercraft, cars, and pedestrians) and thus would likely not be disturbed by Project-related activities. If birds' nest on vessels used to operate dredging and pile driving equipment, these nests may be affected by the Project activities.

While impacts on state and federally listed birds are not expected to occur as a result of Project-related activities, impacts on nesting birds, protected pursuant to the MBTA and California Fish and Game Code, could occur as a result of Project implementation. These impacts can be reduced to a level considered less than significant with implementation of compliance and monitoring plans and AMMs as well as mitigation measure BIO-2 presented in Section 8, below.

4.5.4 Invertebrates

The most common invertebrates found within the Central Bay include blackspotted shrimp (*Crangon nigromaculata*), bay shrimp (*Crangon franciscorum*), Dungeness crab (*Metacarcinus magister*), and slender rock crab (*Cancer gracilis*). Invertebrates provide an important food source for fishes, marine mammals, and birds. Two species of note that have the potential to occur within the Project Area are Dungeness crab (which is of commercial importance) and native oysters. Olympia oyster (*Ostrea lurida*) is native to the Bay and inhabits brackish water conditions typical of the Central Bay. Olympia oysters contribute toward biodiversity as they provide physical structure, an important base for aquatic ecosystem development. They are known to improve local water quality as they stabilize sediment. Native oysters have been reported inhabiting the intertidal and subtidal rocks composing the riprap shoreline. A formal survey or evaluation for the presence of native oysters has not been completed. The riprap shoreline within the intertidal zone of the Project Area could provide suitable habitat for native oysters.

The degraded nature of the offshore areas due to vessel traffic (which causes frequent increases in turbidity) diminishes potential for greater than low-density occupation of shoreline riprap by invertebrates. Work within this zone would be limited to replacement of 400 square feet of missing riprap. Installation of the approximately 20-foot strip of additional armoring placed over soft sediments between the capped/armored locations and the existing shoreline riprap revetment area to tie the capped/armored area into the existing shoreline zone could increase structural complexity and potential suitable substrate for Olympia oyster colonization.

Dungeness crabs, which live in the benthic environment, are susceptible to direct entrainment by dredging equipment (USACE et. al. 1998). Crab abundance tends to be higher in the Central Bay and

North Bay (especially San Pablo Bay) in shallow berthing areas and channels between May 1 and June 30 (USACE 2001). It is possible that Dungeness crabs could be present within the Project Area. However, improvement of the Project Area through removal of contaminated sediments and marine debris would improve habitat for this species in the long term.

Benthic invertebrates colonize soft sediments, providing a food source for fishes and other bottom dwelling organisms (e.g., crab). Capping and armoring would temporarily convert a total of 5.5 acres of soft bottom benthic habitat known to be colonized by invertebrates to a cap made of rock and rip rap. Benthic communities are known to be resilient and elastic assemblages, with rapid recovery rates promoted by proximal undisturbed communities which can provide colonizing larvae (Rosenberg et. al. 2002; Dernie et. al. 2003). A 2003 study on the recovery of soft sediment communities and habitat following physical disturbance demonstrated insignificant changes in environmental parameters between control and disturbed sediment locations as early as 14 days after disturbance, with recovery of associated species assemblages trailing behind and correlated with infill rates of disturbed sites (Dernie et. al. 2003). The dredged and capped areas are expected to be replenished with habitable sediments (due to natural accretion) within several months to a few years (Oliver et al. 1977; Watling et al. 2001).

Project implementation could lead to impacts on invertebrates. These impacts can be reduced to a level considered less than significant with implementation of compliance and monitoring plans and AMMs as well as Mitigation Measure BIO-3 presented in Section 7, below.

SECTION 5. POTENTIAL IMPACTS ON AQUATIC RESOURCES AND HABITAT OF SPECIAL STATUS SPECIES

5.1 Applicable Laws

Aquatic resources and special status species habitats are regulated by state and federal resource agencies (USACE, California State Water Resources Control Board (SWRCB), and CDFW) and are accordingly legally protected via the federal and/or state laws defined below.

5.1.1 Section 404 Clean Water Act (CWA)

Section 404 of the CWA, administered by USACE, establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including open water. Per Section 404, a permit is required prior to discharge of fill material into waters of the United States, unless the activity is exempt from Section 404 regulation.

Waters of the United States generally include tidal waters, lakes, ponds, rivers, streams (including intermittent streams), and wetlands. Other waters are non-tidal, perennial, and intermittent watercourses and tributaries to such watercourses [33 C.F.R. 328.3(a), 51 F.R. 41250, November 13, 1986].

5.1.2 Rivers and Harbors Act (RHA) of 1899

The RHA, also administered by the USACE, prohibits the construction of any bridge, dam, dike or causeway over or in navigable waterways of the U.S. Administration of section 9 has been delegated to the Coast Guard ((33 U.S.C. 403; Chapter 425, March 3, 1899; 30 Stat. 1151).

5.1.3 National Pollutant Discharge Elimination System (NPDES) Permit Program

The NPDES Permit Program, also authorized by the CWA, controls water pollution by regulating point sources (discrete conveyances such as pipes or constructed ditches) that discharge pollutants into waters of the United States. The implementation of this federal program has been charged to the State of California for implementation through the SWRCB and Regional Water Boards. In California, NPDES permits are also referred to as waste discharge requirements (WDRs) that regulate discharges to waters of the United States.

Also implemented by the Regional Water Board is the Municipal Storm Water Permitting Program, which regulates storm water discharges from municipal separate storm sewer systems (MS4s). The MS4 Permit Program was established to restore and maintain the chemical, physical, and biological integrity waters of the U.S./State and reduce/eliminate storm water pollution.

5.1.4 Section 401 Clean Water Act (CWA)

The SWRCB and its nine regional water boards have been charged with the protection and enhancement of water quality in the state of California. Pursuant to the Porter Cologne Water Quality Control Act (Porter Cologne), waters of the State are defined as “any surface water or groundwater, including saline waters, within the boundaries of the state.” This is generally taken to include all waters of the U.S., all surface waters not considered to be waters of the U.S. (non-jurisdictional wetlands), groundwater, and territorial seas (with territorial boundaries extending 3.0 nautical miles beyond outermost islands, reefs, and rocks and includes all waters between the islands and the coast). Per Porter Cologne, the Regional Water Board has authority to regulate discharges of fill and dredged material into Waters of the State.

5.1.5 Federal Endangered Species Act (FESA)

When species are listed as endangered or threatened under FESA, the federal government is also directed to designate critical habitat for these species. Under FESA, critical habitat is defined as a "specific geographic areas that contain features essential to the conservation of an endangered or threatened species and that may require special management and protection." The FESA requires Federal agencies to use their authorities to conserve endangered and threatened species and to consult USFWS and/or NMFS about actions that they carry out, fund, or authorize to ensure that they will not destroy or adversely modify critical habitat.

5.1.6 Magnuson-Stevens Fishery Conservation and Management Act (MSA)

The MSA (16 U.S.C. §§ 1801–1884) was passed in 1976 to conserve and manage U.S. fishery resources, prevent overfishing, rebuild overfished stocks, and facilitate long-term protection of Essential Fish Habitat (EFH). The MSA (Section 3) defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Under the MSA, EFH includes the associated physical, chemical, and biological properties that are used by fish (50 CFR 600.10), and "adverse effect" means any impact that reduces either the quality or quantity of EFH (50 CFR 600.910(a)). A subset of EFH are Habitat Areas of Particular Concern (HAPCs). These areas provide important ecological functions and/or are especially vulnerable to degradation and can be designated based on either specific habitat types or discrete areas. Estuaries and submerged aquatic vegetation (e.g., eelgrass) are both HAPCs.

The MSA is implemented by regional Fishery Management Councils that work with NOAA Fisheries to develop and implement Fisheries Management Plans (FMPs). The FMPs must identify the EFH for each fishery within their jurisdiction. Section 305(b) of the MSA directs federal agencies to consult with NOAA Fisheries on all actions or proposed actions that may adversely affect EFH to obtain avoidance and minimization consultation as well as conservation and enhancement recommendations.

5.2 Methodology

Information about aquatic resources that could occur within the Project Area was obtained from the following sources:

- NMFS Listed Species, Critical Habitat, EFH, and MMPA species lists (NOAA 2016)
- NOAA Fisheries Critical Habitat shapefiles
- NOAA Fisheries EFH shapefiles
- NOAA Fisheries EFH Mapper (NOAA 2020)
- Existing literature as cited in the text

The NOAA Fisheries Listed Species, Critical Habitat, EFH, and MMPA species data were used to query all federally endangered, threatened, candidate, and proposed fish species, as well as designated critical habitat (defined as habitats determined to be essential for the survival of that species) and EFH in the San Francisco North, Point Bonita, San Quentin, Oakland West, and San Francisco South quadrangles. NOAA shapefiles were used to map critical habitat and EFH within the Project Area (Figures 9 and 10). As these large shapefiles are not accurate on the small scale of the Project Area, the limit of NOAA Fisheries jurisdiction was mapped as the high tide line along the shoreline in these figures.

5.3 Aquatic Resources Present Within the Project Area

5.3.1 Waters of the U.S./State

The approximately 47-acre Project Area is entirely within jurisdictional WOTUS, under the jurisdiction of the USACE pursuant to the Section 404 of the CWA and the RHA, as well as the SWRCB pursuant to the Section 401 of the CWA and the Porter Cologne . The southern Project Area boundary is defined by a concrete seawall, which generally coincides with the high tide line and mean high water. Subtidal and intertidal zones occur within the offshore areas.

5.3.2 Critical Habitat

All Bay waters within the Project Area are critical habitat for southern DPS green sturgeon, steelhead trout (Central Valley DPS and Central California Coast DPS), and Sacramento River Winter Run ESU Chinook salmon (Figure 9). Critical habitat within estuary habitat is defined by the perimeter of the water body or the elevation of extreme high water, whichever is greater.

While the Project Area is located within designated critical habitat for federally listed fish species, the elements (physical or biological features) that are essential to the conservation of these species (abundant prey items, high water and sediment quality, aquatic vegetation, and nearshore marine areas free of obstruction) are poorly developed as the offshore areas are partially degraded and habitat is highly limited due to the presence of shoreline stabilization, non-native invasive species, historical discharge and accumulation of contaminants and debris, periodic dredging, vessel traffic (which causes frequent increases in turbidity), and the resulting lack of submerged aquatic vegetation and stable high quality habitat components.

5.3.3 Essential Fish Habitat

The entire Bay is classified as EFH for species managed under the Pacific Coast Salmon FMP , the Coastal Pelagic Species FMP, and the Pacific Coast Groundfish FMP (Figure 10). Listed salmonids that are managed under the MSA and that may occur within EFH in the Project Area are limited to Chinook salmon. Although coho salmon are also managed under the Pacific Coast Salmon FMP, they are presumed to be extirpated from the Bay and are not expected to occur within the Project Area. Pelagic species that are not federally listed but managed under the MSA and that may occur within EFH in the Project Area include Pacific sardine, Pacific (chub) mackerel, Pacific jack mackerel, northern anchovy, Pacific herring, and jacksmelt. Groundfish refers to more than 90 types of groundfish, flatfish, rockfish, sharks, and skates known to occur on the West Coast. Species managed under the

Pacific Coast Groundfish FMP but are not federally listed that may be within EFH in the Project Area include English sole.

HAPCs are a subset of EFH. The Pacific Coast Groundfish FMP designates HAPCs for groundfish along the West Coast and within the extent of the Bay. The groundfish HAPC is based on both specific habitat types and discrete areas including estuaries, canopy kelp, seagrass, and rocky reefs. The Pacific Coast Salmon FMP describe components of the salmon HAPCs to include complex channel and floodplains, thermal refugia, spawning habitat, estuaries, and marine and estuarine submerged aquatic vegetation. Although the HAPC designation does not confer additional restrictions, designation does prioritize and focus conservation efforts. HAPCs are high priority areas for conservation and management because they are important to ecosystem function, sensitive to human activities, stressed by development, or rare (NOAA 2020).

5.3.4 Wildlife Corridors and Nursery Sites

A wildlife corridor is an area of habitat adjoining two or more larger areas of similar wildlife habitat, often connecting wildlife populations separated by natural or created activities, disturbances, or structures. Wildlife corridors are used by individuals and populations for dispersal and migration, allowing for genetic exchange, population growth, and access to larger stretches of suitable habitats, and functionally reduce fragmentation.

The Central San Francisco Bay connects the greater San Francisco Bay-Delta and inland rivers to the Pacific Ocean and is an important part of the migration route for anadromous fish and marine mammals. The greater San Francisco Bay-Delta is an important wintering and stop-over site along the Pacific Flyway, providing refuge to 300,000 migrating birds (NOAA 2007). The Bay is also considered a productive nursery for fish, birds, mammals, and invertebrates. The Project Area provides suitable foraging habitat for some of these species. The Project Area's location along the margins of the Central San Francisco Bay place it within these essential wildlife corridors; however, the Project Area itself does not represent a wildlife nursery or an important element of those corridors.

5.4 Impact Assessment

5.4.1 Waters of the U.S./State

The implementation of the Project would require placement of fill within approximately 9.8 acres of WOTUS. All fill would be placed bayward of the hightide line (limit of CWA applicability) and mean high water (limit of RHA applicability) (Figure 11). It is of note that in Area C alone, "net fill" would increase due to the placement of the cap directly over the sediment surface (i.e., no dredging/removal would occur) under the pier in Area C1. Collectively, proposed remediation efforts would include the removal of approximately 88,000 cubic yards of impacted sediment and debris from the Project Area and the placement of approximately 51,500 cubic yards of clean fill associated with the capping and/or armoring efforts. The Project would result in no net fill of the Bay (i.e., net removal of 34,800 cubic yards of impacted sediment and/or marine debris). Estimates of required fill (capping and armoring) and sediment removal (dredging), in cubic yards and acres, are summarized in Table 3.

Project-related activities are not expected to result in a loss of WOTUS, as fill would not cause a loss in the surface area or volume of the Bay. Removal of sediments from the Bay and placement of permanent fill (cap and associated armoring) would result in disturbance of approximately 9.8 acres of WOTUS, requiring USACE and Regional Water Board authorization. Dredging and debris removal, 88,000 cubic yards over 9.8 acres, would improve water and sediment quality, as well as benthic habitat, in the long-term due to removal or containment of contaminants. Short-term adverse effects, associated with increases in turbidity, acoustic disturbance, and temporary reduction in fine sediment in the upper portions of the sediment profile, would occur. However, work would not result in a long-term loss of functions and values provided by the aquatic resource, as the Project would not result in an increase in the built environment (i.e., constructed structures or features) within the Bay. Project adverse effects are short-term and associated with construction activities.

Project impacts on WOTUS can be reduced to a level considered less than significant with implementation of compliance and monitoring plans and AMMs presented in Section 7, below.

Table 4. Approximate Quantities and Areas for Remedy Components

	Remedial Response Area							
Description	**A**	**B**	**C1**	**C2**	**C (C1+C2)**	**D**	**E**	**Total**
	Volumes (cubic yards)							
Dredging & Debris Removal	10,000	5,500	0	13,000	13,000	8,000	51,500	88,000
Cap/Armor	5,500	5,000	3,500	10,000	13,500	6,500	21,000	51,500
Shoreline Erosion Protection	140	150	880	230	1,110	210	90	1,700
Net Fill	*-4,360*	*-350*	*4,380*	*-2,770*	*1,610*	*-1,290*	*-30,410*	*-34,800*
	Areas (in acres)							
Dredge/Cap/Armor	0.8	0.8	0	1.3	1.3	0.7	4.1	7.7
Cap/Armor Only	0.02	0	0.7	0.2	0.9	0.3	0.2	1.4
Shoreline Erosion Protection	0.03	0.1	0.3	0.06	0.4	0.06	0.08	0.7
Removal Only	0	0.2	0	0.07	0.07	0	0	0.3

Notes:

Dredging and Debris Removal Volume: The sum of material (sediment and debris) that would be removed (i.e., dredged) from each area. Debris volumes are estimated to be approximately 21,000 cubic yards (21% to 34% of each remedial response area, site-wide average of 24% of all removal).

Cap/Armor Volume: The sum of the volume of material that would be placed either over each removal area or in areas where removal would not be performed but a cap (including armor where needed) is required.

Supplemental Erosion Protection Volume: The sum of material that would be placed over exposed sediment where there is a gap between the cap and the existing shoreline revetment to protect this edge of the capping remedy. These values would be refined during the design process.

Net Fill: The difference between the Removal Volume and the Cap/Armor Volume. A negative number means more material would be removed than placed, creating more water column volume.

Dredge/Cap/Armor Area: The surface area for each area where removal would occur and a cap, which may include armor, would be placed following the removal.

Cap/Armor Only Area: The surface area for each remedial response area where a cap only (without removal), which may include armor, would be placed.

Supplemental Erosion Protection Area: The surface area for the Supplemental Erosion Protection.
Removal Only Area: The surface area for area where only removal would occur (i.e., no cap is necessary).

Table 3 excludes fill volume and area for replacing deficient riprap in existing riprap areas along the shoreline (approximately 29 cubic yards over 400 square feet).

5.4.2 Critical Habitat

Effects on critical habitat could occur due to removal of sediment, disturbance of benthic habitat, and removal of marine debris. Increased shading is not expected, as no new overwater structures are proposed. One of the FS/RAP-stated RAOs is to "*Prevent toxicity to fish, birds, and humans exposed to PAHs through consumption of biota with PAH concentrations bioaccumulated in prey tissue via direct contact with sediments and associated pore water or through the aquatic food web*." Removal of 88,000 cubic yards of contaminated sediment and cap installation are intended to isolate the sources of contamination, preventing the pathway to the food chain.

In the short term, dredging may expose contaminated sediments; however, the sediment cap placement is proposed to occur shortly after dredging, minimizing exposure and release of contaminated sediments (Haley & Aldrich 2020b). Exposure of embryos can result in a suite of detrimental effects: edema (swelling) of the yolk sack, hemorrhaging, disruption of cardiac function, enzyme induction, mutation of progeny, craniofacial and spinal deformities, neuronal cell death, anemia, reduced growth, and impaired swimming (NMFS 2009).

Critical habitat could be affected through temporary replacement of soft sediment with armoring, but it is expected that sedimentation would occur quickly, and benthic organisms would recolonize the impacted area within several months to a few years (Oliver et al. 1977; Watling et al. 2001). Additionally, large foraging areas immediately adjacent to proposed work areas would continue to provide ample foraging until the Project Area is fully recolonized.

Although critical habitat could be temporarily affected during Project construction, these impacts can be reduced to a level considered less than significant with implementation of compliance and monitoring plans and AMMs presented in Section 7, below. Removal and capping of PAH-contaminated material is expected to benefit critical habitat in the action area for southern DPS green sturgeon, steelhead trout (Central Valley DPS and Central California Coast DPS), and Sacramento River Winter Run ESU Chinook salmon in the long term.

5.4.3 Essential Fish Habitat

Project activities that may affect EFH include dredging, cap installation, and pile driving and removal. Adverse effects on EFH from dredging and cap placement can occur when contaminated sediment is suspended in the water column. These activities can result in localized losses of organisms that serve as prey items for fish due to increased turbidity. If contaminants escape into the environment, EFH can become temporarily impacted by contaminants. Tidal action and underwater currents could result in the movement of small amounts of contaminated sediments outside the current Project Area. Some portion of PAHs adsorbed to sediment particles may be released into surface water as "dissolved-phase" contaminants. Dredging elutriate testing reported in the RI Report (Haley & Aldrich 2020b) and the FS/RAP (Haley & Aldrich 2021) has demonstrated that effects on surface water quality are temporary and primarily associated with suspended particles. Dredging may expose contaminated sediments; however, the exposure would be temporary until the sediment cap is placed. These short-term effects are minor compared to the potential long-term adverse effects of failure to implement the Project (sustained levels of PAHs in surficial sediment over the RAL within the project area). Avoidance measures, specifically the use of turbidity curtains to surround remedial response areas, would isolate the effects to the smallest area practicable.

Pile driving can generate underwater sound pressure waves that may adversely affect the ecological function of EFH by modifying the water column such that managed fish and prey species are killed, harmed, or injured (Caltrans 2001; Longmuir and Lively 2001; Stotz and Colby 2001). Limitations on hammer type and size and type of pile should minimize adverse effects on EFH.

The primary adverse effect on EFH from removing piles is the suspension of sediments, which may result in harmful levels of turbidity and release of contaminants contained in those sediments. Vibratory pile removal tends to cause the sediments to slough off at the mud line, resulting in relatively low levels of suspended sediments and contaminants. Breaking or cutting the pile below the mud line may suspend only small amounts of sediment, if the stub is left in place and little digging is required for access to the pile. Direct pull or use of a clamshell to remove broken piles, however, may suspend larger amounts of sediment and contaminants, producing a potentially harmful plume of turbidity and/or contaminants. Adverse effects on EFH are possible during pile removal, but the long-term benefits to EFH obtained by removing a consistent source of contamination outweigh the temporary adverse effect of turbidity. In addition, within the Pacific Coast Groundfish FMP, rocky reefs, defined as waters, substrate, or other biogenic features associated with hard substrate (bedrock, boulders, cobble, gravel etc.), are identified as a habitat type within EFH that may qualify as a HAPC. As such, placement of a cap may effectively create a rock reef benefiting groundfish species.

In addition, the temporary disturbance of 9.8 acres of benthic habitat would temporarily reduce food source for managed fish. As stated, sediment is anticipated to accumulate and recolonize quickly as such effects to EFH would be temporary.

Although EFH could be temporarily affected during Project construction, these impacts are temporary and can be reduced to a level considered less than significant with implementation of the compliance and monitoring plans and AMMs presented in Section 7, below.

5.4.4 Wildlife Corridors and Nursery Sites

The proposed work would not result in a change to condition (i.e., a barrier to fish passage) that would prevent continued passage through the Project Area in the long-term. The Project Area is not within the migration route for anadromous fish or marine mammals and in-water work would be limited to the species-protective work windows (see Section 7). Accordingly, *project-related activities are not expected to result in significant impacts on wildlife corridors or wildlife nurseries*, since the effects of these activities would be limited in scope. These effects would include minor water quality and short-term underwater sound alterations that would not affect use of the Central San Francisco Bay as a wildlife corridor.

5.4.5 Beneficial Effects of the Project

The Remedial Investigation Report (Haley & Aldrich 2020b) evaluated potential ecological receptors and included benthic invertebrates, epibenthic invertebrates, pelagic and demersal fish, birds, and marine mammals (as well as humans). The exposure assessment for ecological receptors indicated that dermal contact with surface water or pore water (by infaunal and epibenthic invertebrates and pelagic and demersal fish), ingestion of and dermal contact with sediment (by infaunal and epibenthic invertebrates and demersal fish), and ingestion of prey species tissue (by infaunal and epibenthic invertebrates, pelagic and demersal fish, birds, and marine mammals) are potentially complete pathways for exposure to PAHs in sediment within the AA (Haley & Aldrich 2020b). Potential exposure pathways are ways in which human and ecological receptors may come into contact with PAHs within the AA. For exposure pathways to be complete, four elements must be present: (1) a source of PAHs, (2) a mechanism for migration of PAHs to media where exposure could occur, (3) a receptor at the exposure medium, and (4) an exposure route at the point of contact with the exposure medium. Potential exposure can only occur when all four of these elements are present.

Through implementation of the recommended remedy and attainment of the RAO, sediment with PAHs over the RAL within the AA would be removed or contained (i.e., capped in such a way that no exposure to ecological receptors would occur). The remedy would result in long-term beneficial improvement to the habitat by either removing or physically isolating the PAHs from fauna, flora, and the habitats present. Once contaminated sediment is removed, a cap and/or armor layer would be placed within most removal areas to isolate any potentially impacted sediment left in place. The cap has been designed based on engineering analysis that shows the effectiveness of the cap in terms of chemical isolation and protection against erosion, which would further minimize habitat loss or degradation. The Project would result in long-term net benefits to critical habitat through the removal and capping of contaminated sediments.

SECTION 6. APPLICABLE LOCAL PLANS, ORDINANCES, AND LAWS

6.1 San Francisco Bay Conservation and Development Commission (BCDC) Jurisdiction and the San Francisco Bay Plan (Bay Plan)

The McAteer Petris Act (MPA) designates and authorizes BCDC to regulate development within the San Francisco Bay region's coastal zone, requiring authorization to fill, extract materials, and enact changes in land use, water, or existing structures in the San Francisco Bay-Delta region within BCDC's jurisdiction. BCDC's jurisdiction covers the Bay, the shoreline band of land extending inland for 100 feet from the shoreline of the Bay, salt ponds, managed wetlands, and certain waterways consisting of all areas that are subject to tidal action on named tributaries that flow into the Bay, as listed in the MPA. In addition to state regulating authority, BCDC has authority over federal projects and projects requiring federal authorization pursuant to Section 307 of the Coastal Zone Management Act (CZMA), using the federally approved Management Program for the Bay Segment of the California Coastal Zone to exercise its federal consistency authority under the CZMA.

BCDC created and has been charged with implementing the Bay Plan (BCDC 2019), which specifies goals, objectives, and policies for existing and proposed waterfront land use and other areas. The Bay Plan also identifies priority use areas on and around the Bay.

The Bay Plan policies that are most relevant to the Project include those related to placement of fill in the Bay, improvements within the 100-foot shoreline band, and sea level rise. As a part of the application to BCDC for a permit pursuant to the MPA, Project compliance with Bay Plan policies would be reviewed and confirmed prior to permit issuance. Project consistency with Bay Plan policies applicable to biological resources (i.e., fish, other aquatic organisms and wildlife, water surface area and volume, and subtidal areas) is summarized in Appendix B.

6.2 Port of San Francisco's Waterfront Land Use Plan

The Project Area is located within the Fisherman's Wharf Subarea of the Port of San Francisco's Waterfront Land Use Plan. The plan's priority for the Fisherman's Wharf Subarea is to reinvigorate the fishing industry while supporting visitor-serving activities, the combination of which has made the Wharf one of the top visitor attractions in the United States, generating substantial revenues to the Port and the City and County of San Francisco. The primary challenge in the Fisherman's Wharf Subarea is considered to be financing requirements for the improvements needed to ensure the continued presence and improved health of the fishing industry.

Applicable development standards for the Project Area include the following:

- Operate and manage activities to ensure compliance with all applicable environmental and water quality laws and regulations. Coordinate compliance efforts to improve water quality with the Fisherman's Wharf Environmental Quality Advisory Committee.
- Remove the deteriorated portion of Pier 43 that extends into the Bay, north of the Ferry Arch.

The Project would improve the aquatic environment of the Fisherman's Wharf Subarea, with the removal of PAH-impacted sediments and non-native debris from the Bay floor. While the above-water deteriorated portion of Pier 43 would not be removed as part of Project-related activities, non-native debris on the Bay floor in the vicinity of Pier 43 including pier pilings and remnants, rock, rubbish, and trash would be removed and disposed of appropriately. The Project would not conflict with the Port of San Francisco's Waterfront Land Use Plan.

6.3 San Francisco Bay Subtidal Habitat Goals Report

The San Francisco Bay Subtidal Habitat Goals Report (Goals Report) is a collaboration among BCDC, the California Ocean Protection Council, the California State Coastal Conservancy, NOAA, the NMFS, and the San Francisco Estuary Partnership, developed to provide a Bay-wide approach to setting science-based goals for maintaining a healthy, productive, and resilient ecosystem within the submerged areas of the Bay (California State Coastal Conservancy et al. 2010). The Goals Report has set resource management goals and criteria for soft and hard subtidal substrate, artificial structures, macroalgae beds, and shellfish beds. The Goals Report includes habitat conservation goals that promote allowing no net loss or disturbance of soft bottom and rock habitats (subtidal and intertidal zones), enhancing habitat function of artificial structures, minimizing placement of artificial structures detrimental to subtidal habitat function, protecting native shellfish habitat and existing eelgrass habitat, and protecting macroalgal beds (*Fucus* and *Gracilaria* spp.). The San Francisco Bay Goals Project provides guidance to regulatory agencies; however, it is not a permitting mechanism.

The Project would comply with the Goals Report as the minimum necessary placement of fill has been chosen to meet the Project purpose, which is to achieve the RAOs for the remediation. Ultimately, the Project would improve the natural environment through containment of PAHs and would not result in unnecessary conversion of Bay habitat. The Project would therefore not conflict with the guidance provided in the Goals Report.

6.4 Long-Term Management Strategy for Placement of Dredged Material in San Francisco Bay Region

The Long-Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region (LTMS) was created in 1990 as a collaborative partnership involving regulatory agencies, resource agencies, and stakeholders working together to address potential impacts from dredging and dredged material disposal on water quality, wildlife, and beneficial uses of the Bay. CDFW, the USFWS, and the NMFS have collaborated on the LTMS to develop measures to avoid and minimize the potential impacts of dredging and disposal projects. One of the primary tools used to avoid and minimize the potential adverse effects of dredging and in-Bay disposal was environmental work windows. Environmental work windows are established periods within the calendar year that avoid or minimize overlap with the presence of a target species or a sensitive life stage of a target species. For certain species listed under the FESA, and some non-listed species of special concern, environmental work windows were incorporated into the LTMS Program. During environmental work window periods, dredging and disposal activities are restricted in specific areas to protect listed species and species of special concern.

On July 9, 2015, NMFS issued a Biological Opinion to USACE enumerating many work windows and avoidance measures applicable to the Project.

6.5 San Francisco Tree Ordinance

The San Francisco Public Works Code (Sections 808, 810) states that it shall be unlawful for any person to engage in any construction work on private or public property without first taking steps to protect "Protected Trees" from damage, including damage caused by soil compaction or contamination, excavation, or placement of concrete or other pavement or foundation material. If excavation, construction, or street work is planned within the dripline of a "Significant Tree," a "Landmark Tree," or a tree on any street or other publicly owned property, said tree(s) must be adequately protected.

If landside staging and/or access within the Project Area is required for implementation of the Project, no work is expected to occur within the dripline of any onsite trees. Therefore, project implementation would not result in damage to trees protected pursuant to the San Francisco Public Works Code.

SECTION 7. IMPACTS, MONITORING PLANS, AVOIDANCE MEASURES, AND MITIGATION

7.1 Significance Thresholds for Project Impacts

In accordance with Appendix G of the State CEQA Guidelines, Project-related impacts would be considered significant if the Project would result in one or more of the following effects:

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 CDFW or USFWS; or
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 CDFW or USFWS; or
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means; or
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; or
e. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Potential impacts associated with implementation of the Project are addressed below. With implementation of the recommended compliance plans and monitoring programs and AMMs as well as the specific recommended mitigation measures that would be considered for incorporation in the IS/Mitigated Negative Declaration (MND), all Project-related impacts on biological resources can be reduced to a level considered less than significant.

7.2 Regulatory Authorizations

Protected marine mammals are known to frequent Piers 39 through 41. Protected fish species are known to occur throughout the Central San Francisco Bay and could potentially occur within the Project Area. Project-related activities would include the removal of approximately 88,000 cubic yards of impacted Bay floor sediment and non-native debris and placement of 51,500 cubic yards of clean capping and armoring material. Implementation of the Project would result in impacts on a total of approximately 9.8 acres of WOTUS. The Project would include placement of permanent fill within the Bay but would result in no net loss of WOTUS.

Preparation and implementation of the below Environmental Monitoring Plans, control measures, and avoidance and minimization measures, in addition to agency consultation and compliance with Project authorization issued by applicable regulatory agencies, would ensure reduction of impacts on special-status marine mammals and fish, as well as protected habitats, to a level considered less than significant pursuant to CEQA. Prior to Project commencement, consultation with and/or authorization from applicable state agencies (e.g., Regional Water Board, BCDC, and CDFW) and federal agencies (e.g., USACE and NMFS) charged with overseeing potential impacts on special-status species and habitats shall be secured. The project shall be authorized under one of the programmatic consultations for federally listed species or project-level consultation for federally and/or state-listed species and special-status fish species and shall obtain IHA or LOA for marine mammals for project activities. All terms and/or conditions (e.g., monitoring, reporting, timing, and work limits) established within the agency consultations and authorizations would be fully implemented. Any identified compensatory mitigation would be completed consistent with agency consultation and authorization requirements.

7.3 Environmental Monitoring Plans

As discussed in Section 2.5, the compliance and monitoring plans described below would be incorporated into the Project's Contract Documents to ensure protection of the environment.

7.3.1 Stormwater Pollution Prevention Plan or Erosion Sediment Control Plan

Construction activities that would disturb 1 acre or more of soil, or that would disturb less than 1 acre but are part of a larger common plan of development that in total would disturb 1 or more acres, are required to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity Construction General Permit Order 2009-0009-DWQ (Construction General Permit). The Construction General Permit requires the development of a Storm Water Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer. The SWPPP would describe the best management practices (BMPs) to address potential stormwater runoff impacts from construction activities. It is unlikely that the Project would result in disturbance of 1 acre or more of soil, as the remedial work would take place in water and the upland rehandling areas are paved features.

In the absence of a SWPPP requirement, the contractor would prepare an Erosion Sediment Control Plan (ESCP). The ESCP, similar to a SWPPP, would describe measures to be implemented to prevent the discharge of contaminated stormwater runoff from the construction site. Erosion control measures must be in accordance with the requirements of City and County of San Francisco's Construction Site Runoff Ordinance and Best Management Practices Handbook (SFPUC 2013) and the Port of San Francisco's Construction Erosion and Sediment Control Plan Applicant Package (SF Port 2017).

The temporary construction site BMPs to be included in the would include but not be limited to, the following:

a. Measures for managing runoff when water is used for dust control on stockpiles (e.g., imported capping materials and amendments);
b. Measures for monitoring erosion and sediment migration from stockpiles.
c. Specific practices that may be implemented to reduce the sediment load of stormwater runoff from the MHF, including stormwater control devices (earth berms, silt fences/curtains, or other barriers) installed along the perimeter of stockpile areas and protection of existing catch basins with silt fences or gravel bags.
d. Chemical and fuel storage plans (secondary containment and other measures).
e. Inspection and maintenance of protected areas regularly during the course of the work.

f. Sealing or placing filter fabric at storm drains and using other appropriate BMPs.

Specific BMPs that may be implemented to reduce the sediment load of stormwater runoff from the upland dredged material management site include installing stormwater control devices (earth berms, asphalt curbs, silt fences/curtains, or other barriers) around the materials handling areas and protecting existing catch basins with silt fences, asphalt curbs, or gravel bags. The contractor would store fuel and chemicals in such a manner that prevents accidental spills from affecting stormwater (e.g., kept within secondary containment). The ESCP would include a Spill Control Plan, which would address spills of hazardous materials in the materials handling areas.

7.3.2 Dredging and Capping Operations Plan

A Dredging and Capping Operations Plan would be required and submitted to the Port and USACE for approval no sooner than 60 days and no later than 20 days before dredging begins. The Dredging and Capping Operations Plan would detail the Project dredge plan and procedures, controls, placement and disposal operations and monitoring, disposal tracking, and a solid debris management plan. Preparation of a Dredging and Capping Operations Completion Report detailing required post-reporting data for submittal to the Port and USACE would also be required.

7.3.3 Surface Water Quality Monitoring Plan

The Surface Water Quality Monitoring Plan (SWQMP) would be prepared and implemented during dredging of contaminated sediments and construction controls would be implemented as practicable to ensure surface water quality protection. Such controls would include turbidity curtains to control potential release of suspended sediment outside the work area, and containment booms and sorbent booms to contain and remove sheens. The SWQMP would also describe the water quality monitoring program that would be implemented during remedial activities. The SWQMP would be submitted to Regional Water Board for approval and implemented as a condition of the Water Quality Certification.

Monitoring measures could include the following:

- Standard water quality field measurements at each grab sample location: turbidity, dissolved oxygen, and pH. Although not reported, temperature and salinity are also typical field measurement parameters.
- Standard visual observations of the surface water quality surrounding the barge(s) on each day that water grab samples are collected prior to the collection of samples.
- Collection of water grab samples for total PAH and total suspended solids laboratory analysis.
- SWQMP operational contingency requiring the contractor to deploy silt curtains during contaminant dredging should the water quality data collected exceed water quality criteria.

7.3.4 Sediment Processing and Construction Water Management Plan

A Sediment Processing and Construction Water Management Plan (SPCWMP) would be required and submitted the Regional Water Board and the Port for approval prior to project commencement and could be amended (as necessary) as the Project proceeds through the phases. Components of the SPCWMP would include:

- Sediment treatment and dewatering plan (gravity dewatering and the addition of cement or other reagents are assumed to be the method by which dredged sediments are dried);
- Decant water collection, testing, treatment, and discharge/disposal plans;
- Decant or process water discharge limits in accordance with appropriate permits (NPDES General Permit and/or San Francisco Public Utilities Commission Wastewater Discharge Permit);
- A storage plan for decant as well as potable water required for work, including descriptions of storage/fractionation tanks, as needed, and containment methods; and
- Plans for equipment decontamination rinse water (estimated to be containerized and either treated at the MHF or disposed off-site).

7.3.5 Sound Attenuation and Monitoring Plan

Various project activities have the potential to result in the incidental take of fish species or harassment of marine mammals (in the form of Level A or B harassment), implementation of a Sound Attenuation and Monitoring Plan (SAMP) will verify effects are minimized and consistent with anticipated thresholds.

To address elevated underwater noise, an acoustic/hydroacoustic analysis of the proposed work activities would be necessary to determine zones of impact based on regulatory thresholds. A SAMP would be prepared and approved by NMFS and CDFW prior to the start of Project elements identified by the hydroacoustic assessment as causing adverse noise effects. The SAMP would include, but not be limited to:

- modeled zones of impact, or isopleths, from pile driving activities are used to extrapolate take of protected fish and marine mammals
- details on the methods to be used to monitor and verify sound levels during identified sound-inducing activities to ensure that harm to listed fish and protected marine mammals does not occur
- describe management practices to be taken to reduce pile-installation sound to less than Level A Harassment.

If acoustic effects to special status fish and marine mammals exceed those estimated within project authorizations (e.g., NMFS section 7 consultation documents, NMFS marine mammal take authorization, and/or CDFW Incidental Take Permit requirements) results will be immediately reported to the appropriate agency and a contingency plan involving the use of bubble curtains or air barrier shall be implemented to attenuate sound levels to below agency acceptable threshold levels. Sound monitoring results would be made available to the NMFS and CDFW.

7.3.6 Marine Mammal Monitoring Plan

A Marine Mammal Monitoring Plan (MMMP) would be required where MMPA-protected marine mammals are likely to be exposed to sound above established acoustic thresholds. The MMMP would provide means of accomplishing the necessary monitoring and reporting that would account for the level of taking or impacts on populations of marine mammals that are expected to be present while identified Project elements are in progress and would ensure take beyond that authorized does not occur. The MMMP would include conservation measures to avoid or reduce unnecessary sound exposure that may cause injury or behavioral disruption to marine mammals.

The MMMP would be a required condition of the IHA or LOA, issued by NOAA Fisheries. The basic premise of an MMMP, when an IHA or LOA is issued, is to ensure compliance with measures enumerated within the IHA or LOA, including assurance that take authorized is not exceeded. Stop-work provisions may be required if marine mammals enter certain acoustic threshold zones established in the IHA or LOA, or if hydroacoustic monitoring determines that these sound levels exceed those allowed within established thresholds.

7.3.7 Marine Invasive Species Control Plan

During construction, an approved Marine Invasive Species Control Plan would be implemented to contain the spread of non-native species to Bay waters. The plan would include actions to be taken to prevent the release and spread of marine invasive species, procedures for the safe removal and disposal of any invasive taxa observed on the removed structures prior to disposal or reuse of pilings or marina infrastructure, and appropriate procedures for equipment or infrastructure decontamination.

7.4 Avoidance and Minimization Measures

The environmental component of the Project's monitoring program would include the following AMMs relevant to biological resources, as discussed in Section 2.5.

7.4.1 General Avoidance and Minimization Measures

During construction, measures shall be implemented to mitigate temporary construction impacts on the environment and surrounding community, including engineering controls and/or operational BMPs. A construction oversight program shall be implemented to guide and monitor the implementation of construction controls. The oversight program shall include elements such as biological surveys, where required, and monitoring of potential environmental impacts, including water quality/turbidity monitoring during in-water activities, air monitoring (as applicable), noise monitoring, and a qualitative evaluation of odor.

1. <u>Worker Environmental Awareness Training</u>: All construction personnel (hereinafter referred to as personnel) shall attend a mandatory environmental education program facilitated by the Project biologist prior to the initiation of construction activities. Training sessions shall be repeated for all new personnel before they are allowed access to the job site. All personnel shall complete the training and sign a form stating that they completed the training and understand all applicable agency regulations and consequences of non-compliance. The Project sponsor shall keep the forms on file and make them available to the regulatory agencies upon request.

2. <u>Best Management Practices</u>: Every reasonable precaution to protect listed species and EFH-protected species and their habitat(s) from construction by-products and pollutants such as debris, construction chemicals, fresh cement, saw water, or other deleterious materials shall be

exercised. Construction may be conducted from both land and water. Care shall be used by equipment operators to control debris so that it does not enter the Bay.

Pre-mobilization, a Site Mitigation Plan, WPCP/ESCP, SWQMP, SPCWMP, and Waste Management and Transportation Plan (WMTP) detailing Project conditions and environmental mitigation measures that shall be followed during construction, shall be submitted to the Port. Measures would ensure minimization of disruptions to surrounding neighbourhoods, resources, and land uses and would include but not be limited to debris and dust controls, air and water pollution controls, water usage controls, noise and vibration controls, and over-water work and in-Bay work controls. The measures identified in these plans shall be based on the best available technology and shall include, but not be limited to, the following:

- During construction, the barges performing the work shall be configured to capture and contain the debris generated during any sub-structure or in-water work. If debris does reach the Bay, then personnel in workboats within the work area shall retrieve the debris in a timely manner for proper handling and disposal. Debris shall be disposed of at an authorized upland disposal site.

- Fresh cement or concrete shall not be allowed to enter the Bay. Construction waste shall be collected and transported to an authorized upland disposal area, as appropriate, and per federal, state, and local laws and regulations.

- All hazardous materials shall be stored and handled in strict accordance with the Safety Data Sheets for the products. The storage and handling of potential pollution-causing and hazardous materials , including but not necessarily limited to gasoline, oil, and paint, shall be in accordance with applicable federal, state, and local laws and regulations.

- Erodible construction material shall be covered every night and during any rainfall event.

- Construction crews shall reduce the amount of disturbance within the Project Area to the minimum necessary to accomplish the Project.

- Vessels and equipment that rely on internal combustion engines for power and/or propulsion shall be kept in good working condition and compliant with California emission regulations.

- Vehicles and equipment that are used during the course of construction shall be fueled and serviced in an appropriate manner. For waterborne construction equipment, fueling shall be performed from a fully contained or double-walled tank on a fuel barge or "boat," using a fuel transfer hose equipped with automatic shutoff valve. Fueling locations shall be inspected after fueling to document that no spills have occurred. Any incidental spills shall be cleaned up immediately.

- Once the Project is completed, construction material, wastes, debris, sediment, rubbish, trash, fencing, and other construction items shall be removed from the site and transported to an authorized disposal area or recycling facility, as appropriate, in compliance with applicable federal, state, and local laws and regulations.

7.4.2 Avoidance and Minimization Measures for Special-Status Species

In addition to the water quality and other BMPs described above, the following measures shall be implemented to minimize the potential adverse effects on sensitive species. The following avoidance and minimization measures have been developed in accordance with those outlined in existing programmatic agreements, agency guidance documents, and standard industry practices. All species-specific measures may be refined within Project consultations and authorizations.

1. Fish Protections:
   - Illumination shall be directed away from the water when night work is required.
   - Placement of supplemental erosion protection within areas that are exposed during low tide shall occur only during low tides to minimize potential impacts on aquatic species.
   - A hydroacoustic assessment shall be completed to determine which construction activities could produce sounds levels that may result in take of listed fish species. If it is determined that work may result in take of listed fish species, appropriate measures shall be incorporated into assessments and/or applications to ensure protective measures (e.g., sound attenuation) for listed fish species are incorporated into Project authorizations.

2. Debris Removal:
   - Removal actions shall be performed pursuant to requirements and pre-mobilization submittals including the WMTP and ESCP.

3. Pile Installation and Removal Restrictions:
   - Project-related pile driving activities shall consist of piles being installed using a vibratory hammer to the maximum extent feasible. Vibratory pile installation and removal shall only be completed outside of the herring spawning season which occurs between December 1 and March 15. If vibratory pile driving occurs during the peak seasonal salmonid migration period which occurs between December 1 to May 31, work shall occur only during daylight hours, from 1 hour after sunrise to 1 hour before sunset. For vibratory pile driving operations occurring outside the peak seasonal salmonid migration period (June 1 to November 30), illumination shall be directed away from the water when work outside daylight hours is required.

   - In-water impact pile driving will be conducted between (June 1 and November 30), to the maximum extent feasible, to avoid potential impacts to listed migratory fish species (present December 1 to May 31) and the marine mammal pupping season (occurs between March 1 to May 31). If pile installation using impact hammers must occur at times other than the approved work window, the project applicant shall obtain incidental take authorization from NMFS and CDFW, as necessary, to address potential impacts on listed fish species and implement all requested actions to avoid impacts.

   - Before pile driving hammers are operated at full capacity, a soft start shall be implemented by starting the pile driving hammer at the lowest power setting and gradually ramping up to full power. All temporarily removed piles shall be replaced in-kind, using the same pile size and similar material type. If treated wood is used to replace piles, material shall be chosen consistent with applicable and relevant guidance, which includes but is not limited to the following: California Coastal Commission guidelines (CCC 2019), which recommend that if using treated wood, "a type of preservative should be selected that minimizes the risk of aquatic and sediment toxicity." This commonly includes treatment such as ammoniacal copper zinc arsenate (ACZA), which will need to be further evaluated for applicability and risk for the Project.

  - If ACZA or other treated wood piles are required, these piles must be wrapped with a benign material, such as plastic wrap or a polyurea coating, to prevent waters of San Francisco Bay from direct contact with the treated wood. All wrapped wood piles that may be subject to contact with docks, floating debris and/or boats, must be inspected on a yearly basis to confirm the integrity of the wrap and to repair any damaged areas.
  - Applicable building codes (e.g., State of California, Port).
  - The American Wood Protection Association standards.
  - Western Wood Preservers Institute recommendations: Best Management Practices for the Use of Preserved Wood in Aquatic and Sensitive Environments (WWPI et al., 2018).
  - The Use of Treated Wood Products in Aquatic Environments: Guidelines to West Coast NOAA Fisheries Staff for Endangered Species Act and Essential Fish Habitat Consultations in the Alaska, Northwest and Southwest Regions (NOAA 2009).

- Sound attenuation methods will be implemented as required within project authorizations (e.g., NMFS section 7 consultation documents, NMFS marine mammal take authorization, and/or CDFW Incidental Take Permit requirements). Examples of methods of sound attenuation include use of a bubble curtain, marine pile driving energy attenuator (such as an isolation casing), or an impact hammer cushioned using a 12-inch-thick wood cushion. When a bubble curtain is required, the following performance standards shall be implemented:
  - The bubble curtain must distribute air bubbles around 100 percent of the piling perimeter for the full depth of the water column.
  - The lowest bubble ring shall be in contact with the mudline for the full circumference of the ring, and the weights attached to the bottom ring shall ensure 100 percent mudline contact. No parts of the ring or other objects shall prevent full mudline contact.
  - The contractor will ensure that personnel are trained in the proper balancing of air flow to the bubblers and will submit an inspection/performance report for approval by the Port within 72 hours following the performance test. Corrections to the attenuation device to meet the performance standards shall occur prior to impact driving

- Turbidity curtains will be deployed during active dredging and capping operations. As required by agency authorizations, measures will be taken to minimize fish entrapment in the turbidity curtains. If conditions allow (i.e., turbidity conditions are suitably low within the containment as prescribed in the Surface Water Quality Monitoring Plan) curtains to be reefed; lifting and maintaining the ballast and curtain bottom off of the sediment surface, to provide fish passage underneath.

4. Marine Mammal Protections:
   - For in-water construction, heavy machinery activities other than pile driving (i.e., dredging, placement of cap/armoring) shall cease operations and reduce vessel speed to the minimum level required to maintain steerage and safe working conditions if a marine mammal comes within 10 meters of the vessel.

   - Monitoring of pinniped and cetacean disturbance zones shall be conducted by a qualified NMFS-approved marine mammal observer (MMO) in accordance with conditions established in the MMMP. Requirements may include having the MMO conduct surveys before and during impact pile driving as specified in the MMMP. The MMO may be required to inspect the established work zone and adjacent Bay waters and document the following during impact pile driving:

     - Maintain the safety zones established in the MMMP around the sound source, for the protection of marine mammals.

     - Halt work activities when a marine mammal enters the Level A safety zone and resume only after the animal has been gone from the area for a minimum of 15 minutes.

     - When pinnipeds (seals and sea lions) are hauled out in the Project Area, ensure airborne sound levels generated by construction activities dissipate below 100 A-weighted decibels (dBA) upon reaching the animal.

   - A hydroacoustic assessment shall be completed to determine which construction activities could produce sounds levels that may result in harassment of marine mammals (Level A or B). If it is determined that work may result in harassment of marine mammals, appropriate measures shall be incorporated into assessments and/or applications to ensure protective measures (e.g., sound attenuation) for marine mammals are incorporated into Project authorizations.

5. Dredging/Capping Restrictions:
   - The approved SWQMP shall be fully implemented during dredging of contaminated sediments and construction controls would be implemented as practicable to ensure surface water quality protection. Dredging and capping shall be conducted between June 1 and November 30 in accordance with LTMS dredging windows (USACE et. al. 1998). To minimize fish entrainment, turbidity curtains will only be deployed during active capping and dredging.

   - All dredging activities shall be implemented consistent with the standards and procedures set forth by the LTMS and associated NFMS Biological Opinion, FESA Section 7(a)(2) Biological Opinion, LTMS, NMFS Consultation Number: WCR-2014-1599, dated July 9, 2015.

   - Use of diver-assisted micro (hydraulic) dredging will be limited to the maximum extent feasible. If hydraulic dredging is required, a CDFW issued ITP will be obtained establishing measures to reduce potential for fish entrainment in suction dredging equipment. In addition to measures required within the ITP, the following restrictions shall apply:

- The dredge head shall be primed and cleared as close to the bottom as possible but no higher than 3 feet above the bottom.
- Suction dredging shall occur only between June 1 and November 30.
- The dredge operator shall maintain contact with the bottom at all times when the dredge is in operation.
- The dredge water intake (not dredge head) shall be screened with an approved fish screen which meets CDFW screening criteria determined to be protective of longfin smelt.

6. Work Window

Restrictions on in-water construction activities (e.g., dredging, steel pile installation, and capping) during the approved environmental work window shall be adhered to as established by the NMFS at the conclusion of the FESA Section 7 consultation and by CDFW when an ITP is issued. In-water work is generally restricted to "work windows" for San Francisco Bay, which run from June 1 through November 30 each year to protect sensitive species (LTMS 1998). Some in-water construction activities may be approved (during the permitting process) to take place outside these in-water work windows. These activities include but are not limited to:

- Removing, relocating, or replacing docks and other infrastructure
- Installing protection for structures, establishing staging areas, and deploying navigation aids
- Removing piles and installing piles to support turbidity control features as well as pile replacement using vibratory installation methods outside of the herring spawning season (December 1 to March 15).
- Placing backfill and/or armor in some areas.

7.5 Biological Impact 1: Protected Fish [less Than Significant with Mitigation]

Protected fish species are known to occur throughout the Central San Francisco Bay and could potentially occur within the Project Area. As such, implementation of the Project has the potential to result in adverse impacts on protected fish species. The following mitigation measure would reduce these impacts to a level considered less than significant pursuant to CEQA:

Mitigation Measure BIO-1A: In-water work activities may not be conducted during the December 1 to March 15 Pacific herring spawning season. As the spawning season approaches (month of November), a trained biologist shall perform monitoring during in-water Project activities for spawning event indicators (e.g., presence of milt in the water, active surface predation of herring by birds or marine mammals) and/or conduct herring egg surveys. If required, work shall be stopped if a spawning event is detected in the immediate vicinity of in-water work and shall not resume until spawning has ended and herring embryos have hatched.

Mitigation Measure BIO-1B: A Hydroacoustic Assessment shall be completed to determine which construction activities could produce sounds levels that may result in take of listed fish species. Based on assessment findings, appropriate measures (e.g., sound attenuation or work window restrictions) shall be incorporated into project authorization requests. All avoidance measures, monitoring, reporting, timing, and work limit requirements established within regulatory agency consultations and/or authorizations shall be fully implemented. Any identified compensatory mitigation shall be completed consistent with agency consultation and authorization requirements.

7.6 Biological Impact 2: Nesting Birds [less Than Significant with Mitigation]

The barges and equipment to be used for Project-related activities provide suitable nesting habitat for scrape-nesting birds protected pursuant to the MBTA and California Fish and Game Code Sections 3503, 3503.5, and 3511. Similarly, the shrubs and trees within the urban land in the Project Area provide suitable nesting habitat for protected passerine species. Project-related activities could result in take of protected birds in the form of disturbance causing nest abandonment or destruction. The following mitigation measure would reduce these impacts to a level considered less than significant pursuant to CEQA:

Mitigation Measure BIO-2: Project activities that could impact nesting birds will be scheduled to greatest extent practicable to avoid the nesting season (February 1 to August 31). If it is not possible to schedule such activities to occur between September 1 and January 31, a pre-construction nesting bird survey of all suitable nesting habitat within the zone of influence shall be conducted by a qualified biologist within 7 days prior to commencement of construction activities scheduled to occur within the nesting season. The zone of influence would include the area immediately surrounding the work location that supports suitable nesting habitat that could be affected by the Project due to visual or auditory disturbance associated with construction activities scheduled to occur during the nesting season. If no nesting birds are observed during the survey, construction activities may commence as planned.

If active nests are observed during the preconstruction survey, the qualified biologist shall review results with the Project Sponsor and Contractor and evaluate whether the schedule of construction activities could affect the active nests and recommend measures to the project biologist based on the PG&E Nesting Bird Management Plan which could include: a non-disturbance buffer of shall be established (e.g., 50 feet for non-raptors and 250 feet for raptors). This buffer shall remain in place until the young have been determined (by a qualified biologist) to have fledged. These buffers may be modified (e.g., by reducing their size or installing a blind) as deemed appropriate by the project biologist in coordination with the USFWS and CDFW.

A brief survey report documenting the preconstruction survey area and findings shall be prepared by the qualified biologist and submitted to the Project Sponsor prior to initiation of construction during the nesting season. The report shall document presence or absence of any active nests, prescribe a suitable non-disturbance buffer if active nests are present and could be disturbed by Project-related activities. No report of findings is required if construction is initiated during the non-nesting season (September 1 to January 31) and continues uninterrupted according to the above criteria.

If any birds begin nesting within active work areas after construction has commenced, they will be nesting in an environment with high levels of existing and ongoing disturbance and no work exclusion buffer shall be established around these active nests. However, a qualified biologist shall monitor the nest twice a week. If the qualified biologist determines that birds are showing signs of distress associated with construction activities (e.g., frequent vocalization or flushing from the nest), a non-disturbance buffer shall be established as determined by the Project biologist.

7.7 Biological Impact 3: Native Oysters [less Than Significant with Mitigation]

The Project Area provides suitable habitat for native oysters. Project implementation could result in adverse impacts on native oysters. The following mitigation measure would reduce these impacts to a level considered less than significant pursuant to CEQA:

Mitigation Measure BIO-3: Prior to construction, a native oyster survey will be completed. If native oysters are found within or immediately adjacent to the Project Area, it shall first be determined whether avoidance of the beds is feasible. If feasible, impacts on the oyster bed shall be avoided. If complete avoidance is not feasible, the Project sponsor shall request guidance from the NMFS regarding the need for and/or feasibility of moving affected beds. Translocation of oyster beds would be consistent with methods and recommendations presented in Shellfish Conservation and Restoration in San Francisco Bay: Opportunities and Constraints (Zabin et al. 2010).

7.8 Biological Impact 3: Marine mammals [less Than Significant with Mitigation]

The Project Area provides is occupied by marine mammals protected under the MMPA (sea lion and harbor seals). Project implementation could result in adverse impacts marine mammals. The following mitigation measure would reduce these impacts to a level considered less than significant pursuant to CEQA:

Mitigation Measure BIO-4A: A Hydroacoustic Assessment shall be completed to determine which construction activities could produce sounds levels that could resulting in harassment of marine mammals (Level A or B). Based on assessment findings, appropriate measures (e.g., monitoring during specified work activities with stop work authority) shall be incorporated into an IHA or LOA application (for MMPA and FESA protected species). All monitoring, reporting, timing, and work limit requirements established within the project authorizations shall be fully implemented. Any identified compensatory mitigation shall be completed consistent with agency consultation and authorization requirements.

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LIST OF FIGURES

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Sediment Remediation Project, Piers 39 - 43 1/2

Project Site and Vicinity Map

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Sediment Remediation Project, Piers 39 - 43 1/2

USGS Topographic Map, San Francisco North 7.5-Minute Quadrangle

Project Area

0 0.5 1 1.5
Miles
N

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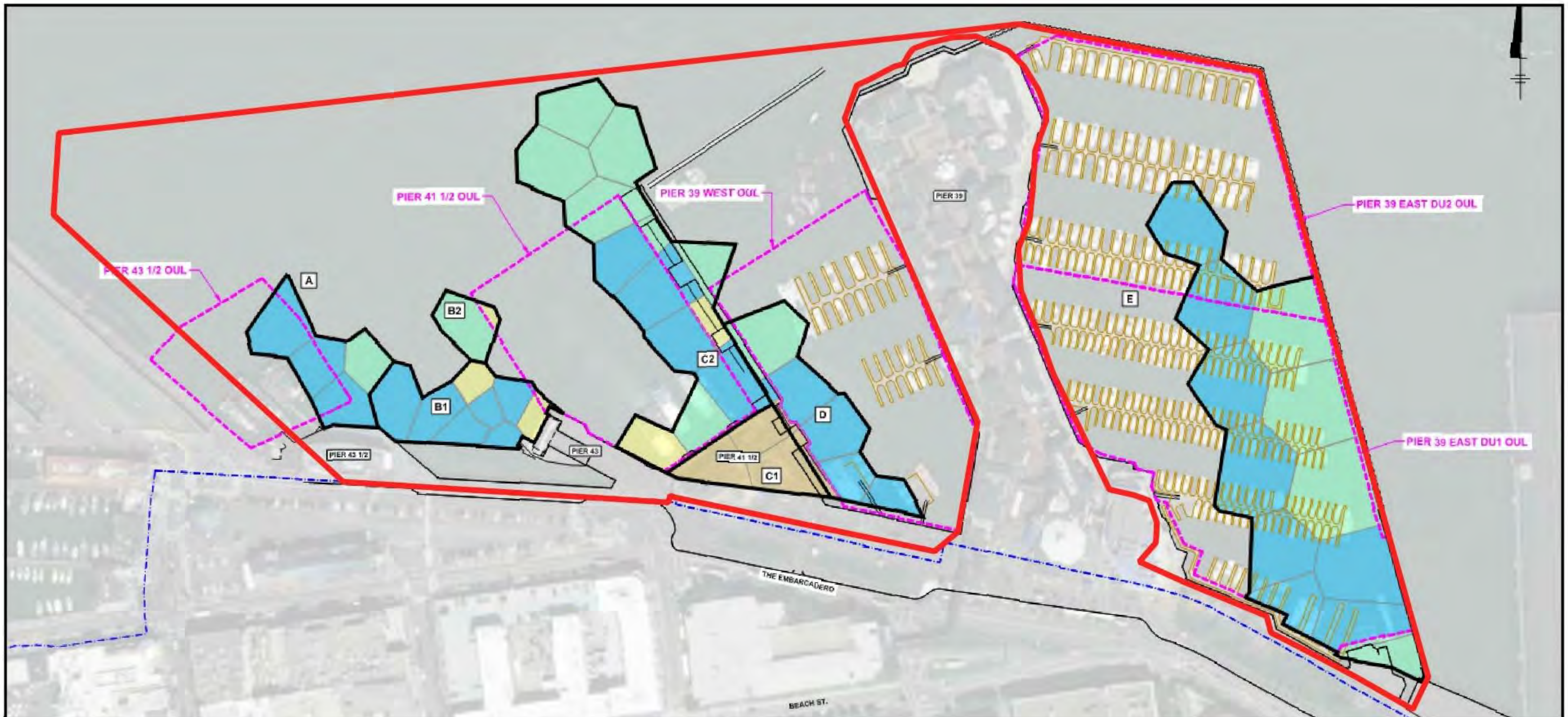

Sediment Remediation Project, Piers 39 - 43 1/2

Remedial Response Areas

- Project Area
- Remove Impacted Sediment, Install Cap, and Administer Institutional Controls
- Administer Institutional Controls
- Remove Impacted Sediment and Administer Institutional Controls
- Install Cap and Administer Institutional Controls

0 100 200 300 400 500
Feet

N

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SEDIMENT REMEDIATION PROJECT, PIERS 39 TO 43 ½

FIGURE #3

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Sediment Remediation Project, Piers 39 - 43 1/2

Material Handling and Management Locations

Project Area

0 1 2 3
Miles
N

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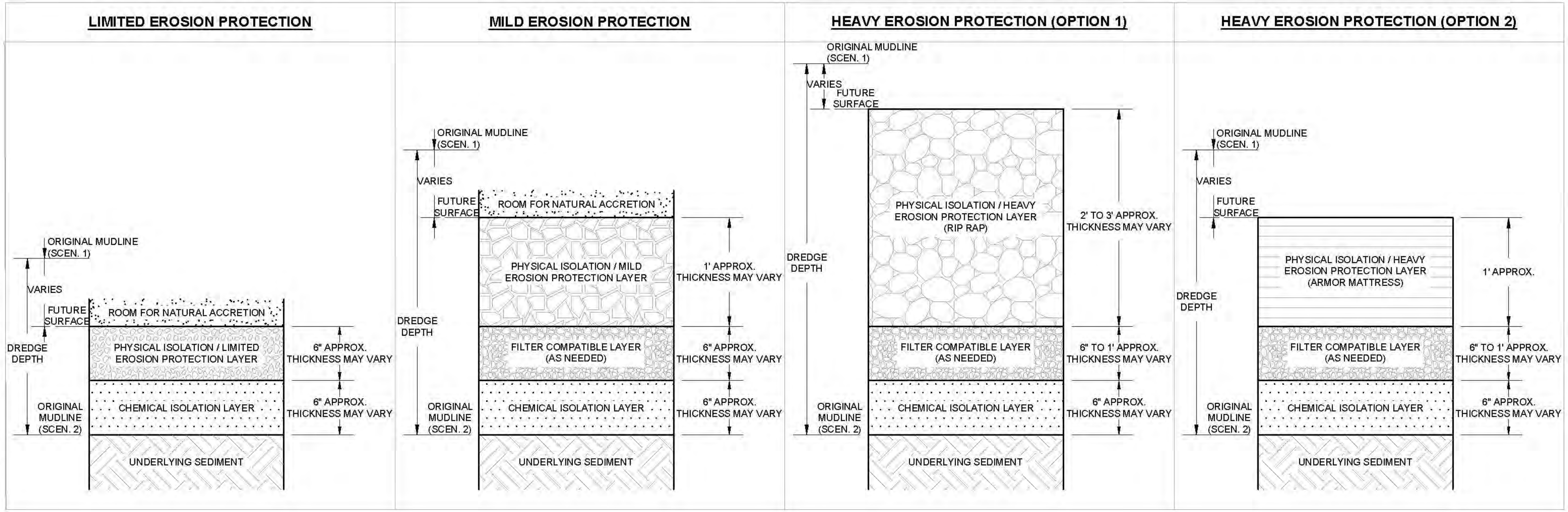

LEGEND

- UNDERLYING SEDIMENT
- CHEMICAL ISOLATION LAYER
- PHYSICAL ISOLATION/LIMITED EROSION PROTECTION LAYER
- FILTER COMPATIBLE LAYER
- PHYSICAL ISOLATION/MILD EROSION PROTECTION LAYER
- PHYSICAL ISOLATION/HEAVY EROSION PROTECTION LAYER (RIP RAP)
- PHYSICAL ISOLATION/HEAVY EROSION PROTECTION LAYER (ARMOR MATTRESS)
- NATURAL ACCRETION

NOTES

1. ALL CAP LAYERS AND DIMENSIONS ARE APPROXIMATE AND SUBJECT TO REFINEMENT DURING THE DESIGN PHASE.
2. UNDERLYING SEDIMENT MAY INCLUDE BAY MUD AND/OR SAND.
3. IN AREAS WHERE TPAH-25 IS GREATER THAN THE 100,000ug/kg SCREENING THRESHOLD IN THE SHALLOW UNDERLYING SEDIMENT, A CHEMICAL ISOLATION LAYER IS INCORPORATED IN THE PRELIMINARY CAP DESIGN. WHERE TPAH-25 IS LESS THAN THE SCREENING THRESHOLD, THE CHEMICAL ISOLATION LAYER MAY NOT BE INCLUDED.
4. PERCENTAGE OF REACTIVE COMPONENT IN CHEMICAL ISOLATION LAYER MAY VARY.
5. THE TYPE OF PHYSICAL ISOLATION AND EROSION PROTECTION WILL BE DEPENDENT UPON THE AMOUNT OF SCOUR EXPECTED IN THE AREA. MILD AND HEAVY EROSION PROTECTION MAY ALSO SERVE AS A MARKER LAYER.
6. SCENARIO 1 INDICATES ORIGINAL MUDLINE IS ABOVE THE DREDGED SURFACE ELEVATION PRIOR TO CAP PLACEMENT. SCENARIO 2 INDICATES ORIGINAL MUDLINE IS APPROXIMATELY AT THE DREDGED SURFACE ELEVATION (E.G. SCOUR HOLES) AND DREDGING MAY NOT BE REQUIRED PRIOR TO CAP PLACEMENT.

HALEY ALDRICH

PACIFIC GAS AND ELECTRIC COMPANY (PG&E)
PIERS 39 TO 45 SEDIMENT INVESTIGATION AREA
FEASIBILITY STUDY/REMEDIAL ACTION PLAN
SAN FRANCISCO, CALIFORNIA

SEDIMENT CAP DETAIL SCHEMATICS

OCTOBER 2020

JRIPLEY Printed: 9/18/2020 8:58 AM Sheet: CAP LYRS (1 ROW)
\\HALEYALDRICH.COM\SHARE\OAK_COMMON\42711_PIER_39\GLOBAL\CAD\FIGURES\42711_0001_PIER_39_CAP LAYER SCHEMATICS.DWG

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Piers 39 to 43 ½ Sediment Remediation Project

Supplemental Erosion Protection

Imagery Source: ESRI
Map Created on: 7/28/21
by S. McGarvey

JOHNSON MARIGOT CONSULTING, LLC

0 100 200 300
Feet

N

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Sediment Remediation Project, Piers 39 - 43 1/2

Land Use Map

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LEGEND

- SPI INDICATION OF PHYSICAL DISTURBANCE

SPI PREDOMINANT SUCCESSIONAL STAGE

- 1 ON 3 *OR* 2 ON 3
- 3
- 2->3
- 2
- 1 *OR* 1>2
- UNSUITABLE SUBSTRATE/INDETERMINATE
- PROPOSED REMEDIAL AREA, DREDGING LIMIT
- PROPOSED REMEDIAL AREA, CAPPING ONLY
- SCOUR FEATURE BELOW OPERATIONAL USE LIMITS (INCLUDING 2-FT ALLOWANCE)
- EXISTING HARDSCAPE CONSIDERED UNSUITABLE INFAUNAL HABITAT
- SOFTSCAPE HABITAT SHOWING BENTHIC COLONIZATION
- SOFTSCAPE HABITAT WITH EVIDENCE OF PHYSICAL DISTURBANCE
- PIER 39 MARINA
- INFERRED SEAWALL LOCATION (SOURCE: 1913 SANBORN FIRE INSURANCE MAPS)
- NATIONAL PARK SERVICE LEGISLATIVE BOUNDARY
- High : 254
- Low : 0

NOTES

1. MULTIBEAM BATHYMETRY DATA COLLECTED 2019; SOME PORTIONS OF THE INVESTIGATION AREA COULD NOT BE IMAGED DUE TO OBSTRUCTIONS OR INSUFFICIENT WATER DEPTHS. DATA COLLECTED ON THE BAY SIDE BUT OUTSIDE OF THE PROPOSED RESPONSE AREAS AND SCOUR FEATURES NOT PRESENTED IN THIS FIGURE.
2. 1899 SHORELINE AND WHARFS/PIERS SOURCE: SANBORN MAPS
3. AERIAL IMAGERY SOURCE: CITY AND COUNTY OF SF, 2014

N

0 200 400
SCALE IN FEET

HALEY ALDRICH

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PIERS 39 TO 45 SEDIMENT INVESTIGATION AREA
FEASIBILITY STUDY/REMEDIAL ACTION PLAN
SAN FRANCISCO, CALIFORNIA

Benthic Habitat Map

JUNE 2020

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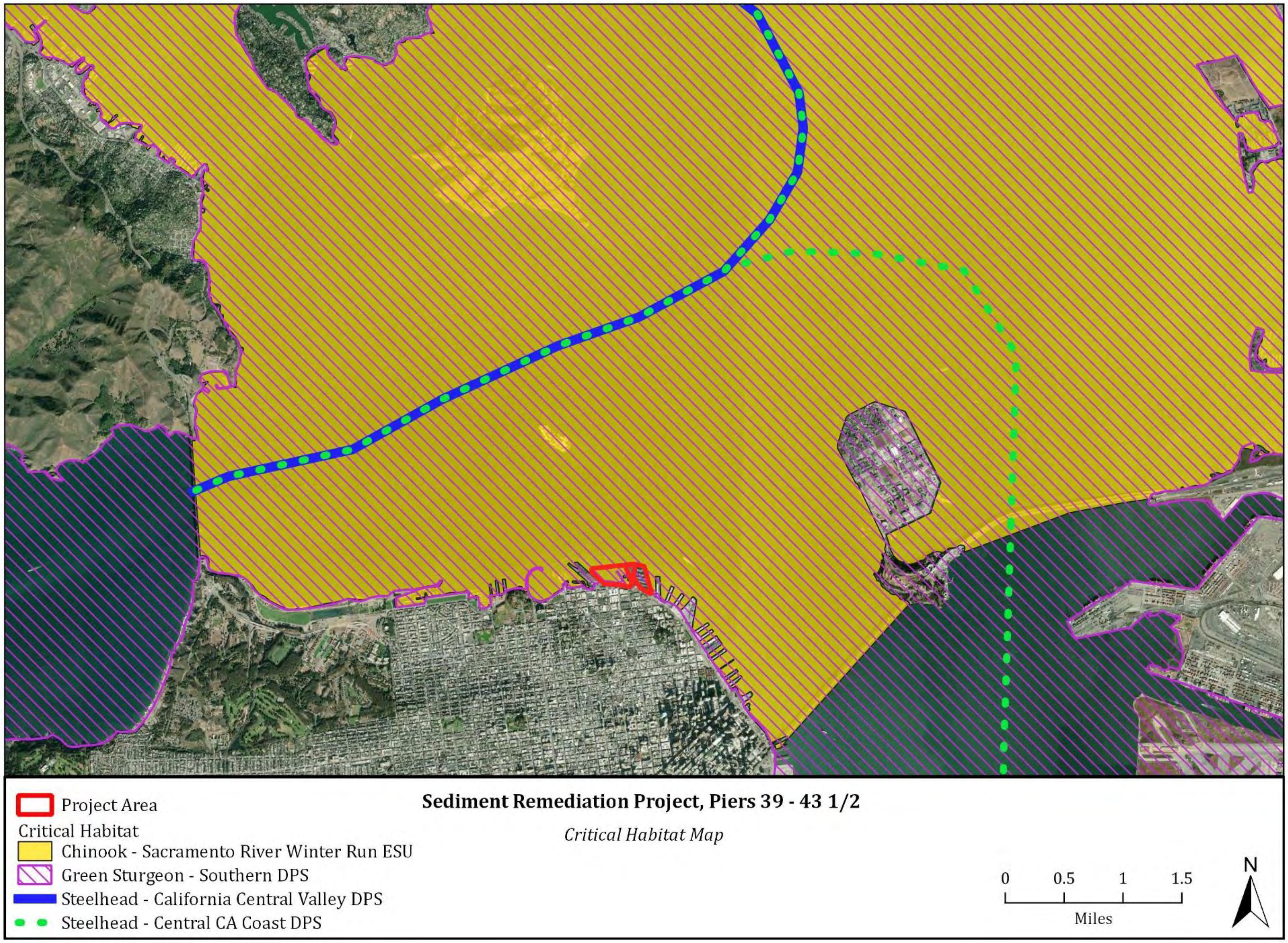
Project Area
Critical Habitat
Chinook - Sacramento River Winter Run ESU
Green Sturgeon - Southern DPS
Steelhead - California Central Valley DPS
Steelhead - Central CA Coast DPS
Sediment Remediation Project, Piers 39 - 43 1/2
Critical Habitat Map
0
0.5
1
1.5
Miles
N

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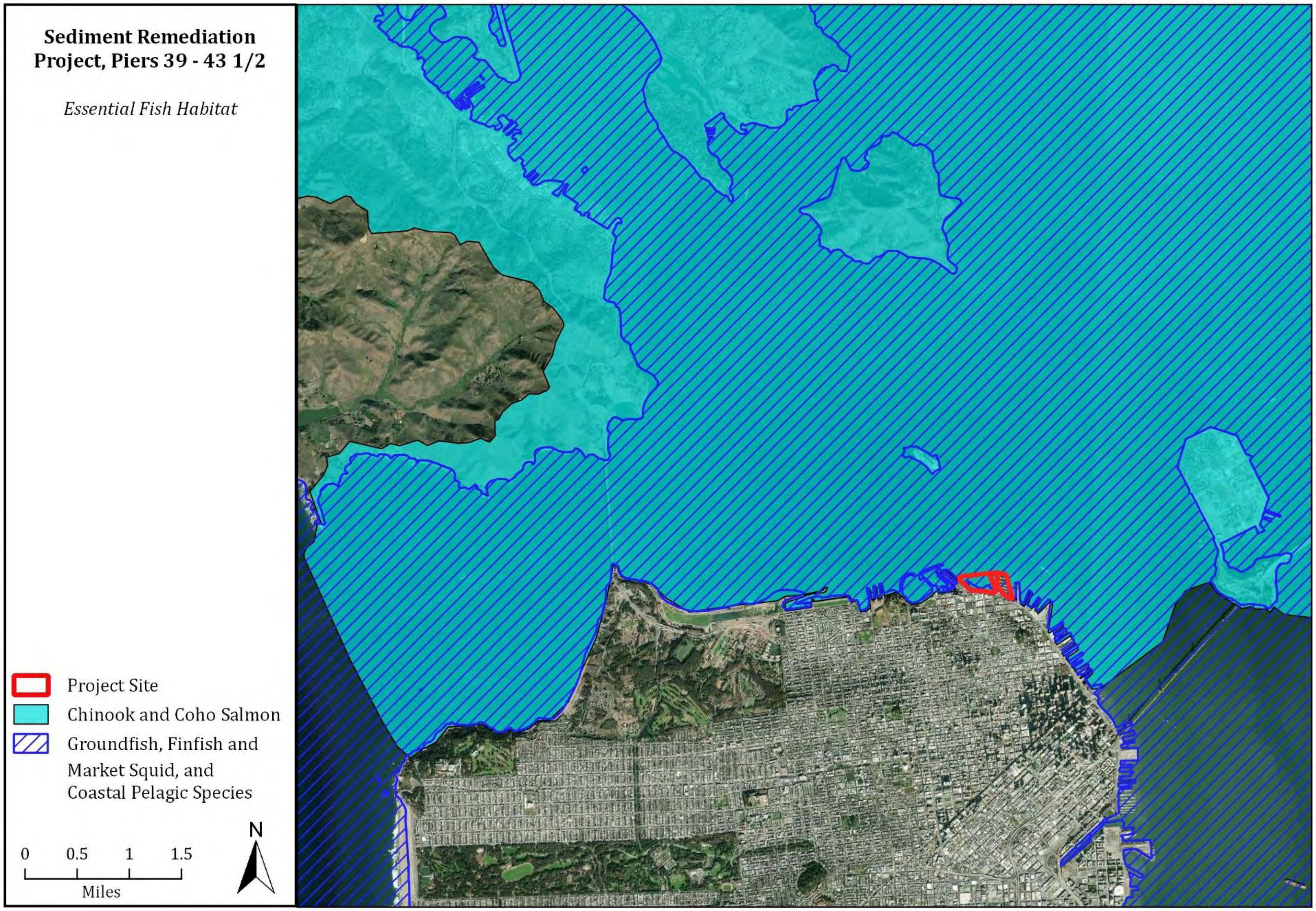
Sediment Remediation Project, Piers 39 - 43 1/2
Essential Fish Habitat
Project Site
Chinook and Coho Salmon
Groundfish, Finfish and Market Squid, and Coastal Pelagic Species
0
0.5
1
1.5
Miles
N

FIGURE #10

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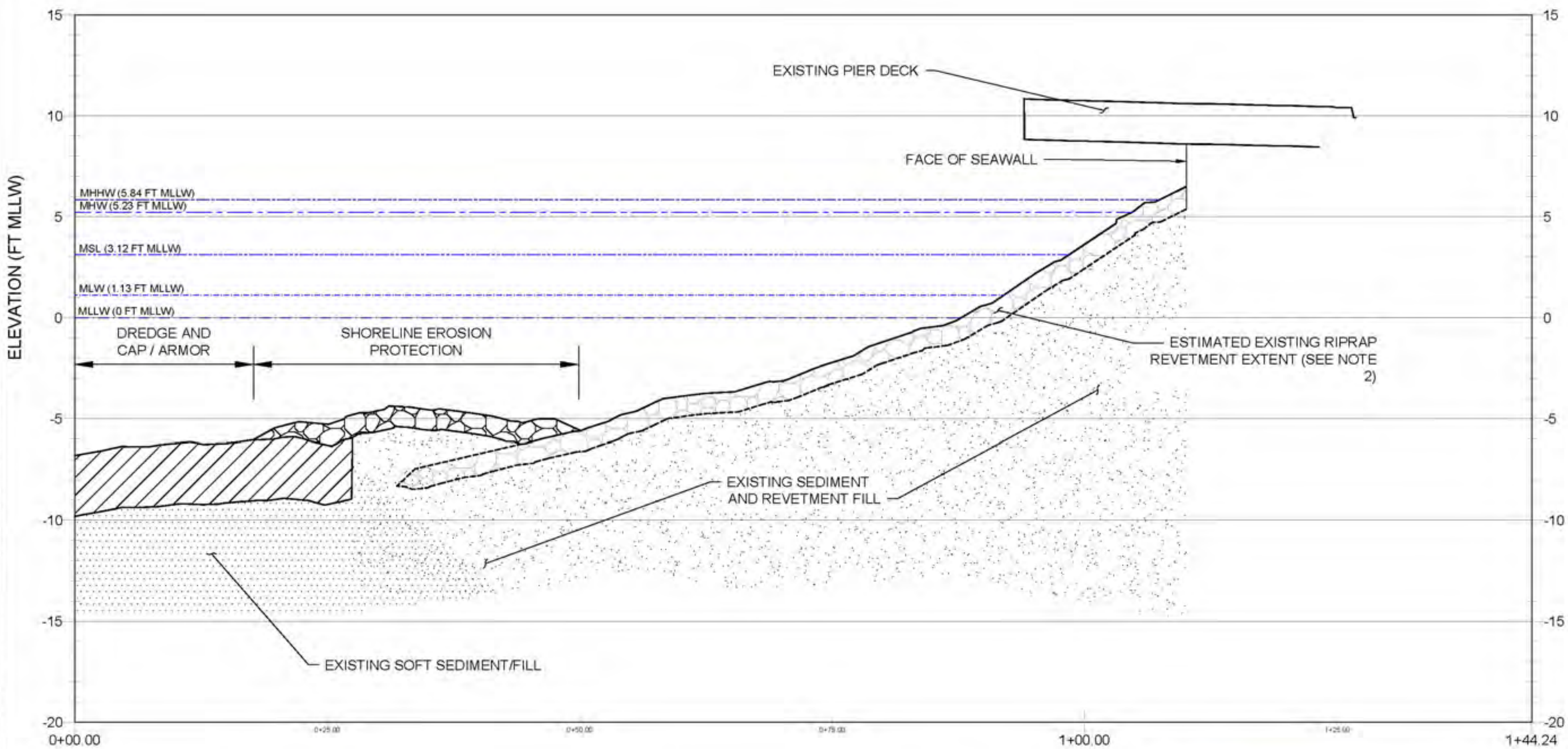

LEGEND

DREDGE AND CAP EXTENT (SEE NOTE 4)	MEAN HIGHER-HIGH WATER ELEVATION (MHHW)
TRANSITION ZONE RIPRAP	MEAN HIGH WATER ELEVAITON (MHW)
ESTIMATED RIPRAP REVETMENT EXTENT	MEAN SEA LEVEL ELEVATION (MSL)
EXISTING SEDIMENT AND REVETMENT FILL	MEAN LOW WATER ELEVATION (MLW)
EXISTING SOFT SEDIMENT/FILL	MEAN LOWER LOW ELEVATION (MLLW)

NOTES

1. BATHYMETRIC AND TOPOGRAPHIC SURVEYS WERE CONDUCTED BY DIXON MARINE SERVICES, ETRAC, AND TOWILL, JANUARY 2019-APRIL 2019. VERTICAL DATUM IS IN REFERENCE TO MLLW BASED ON SAN FRANCISCO TIDE STATION 9414290. HORIZONTAL DATUM IS IN REFERENCE TO NAD83 CALIFORNIA STATE PLANE ZONE 3.
2. EXTENT AND THICKNESS OF EXISTING RIPRAP REVETMENT VARIES BY AREA ALONG THE SEAWALL.
3. CROSS SECTION FOR VISUALIZATION PURPOSES ONLY, NOT FOR DESIGN OR CONSTRUCTION.
4. ALL WORK PRESENTED IN THIS FIGURE IS CONSIDERED PRELIMINARY AND SUBJECT TO REFINEMENT DURING THE DESIGN PROCESS.
5. TIDE DATUM INFORMATION GATHERED FROM NOAA TIDE STATION 9414290, SAN FRANCISCO.

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FEASIBILITY STUDY/REMEDIAL ACTION PLAN
SAN FRANCISCO, CALIFORNIA

TYPICAL SHORELINE EROSION PROTECTION CROSS SECTION

OCTOBER 2020

FIGURE 11

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APPENDIX A

Tables of Special-Status Plant and Wildlife Species Known to Occur in the Vicinity of the Project Area

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Table 1. Special Status Plant Species Known to Occur in the Vicinity of the Project Area

Common Name	Scientific Name	Status	Habitat Type/Components	Occurrence Information	Probability of Occurring on the Project Site
Coast Rockcress	***Arabis blepharophylla***	CNPS Rank 4.3	Rocky soils in broadleafed upland forest, coastal bluff scrub, coastal prairie, and coastal scrub	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Franciscan Manzanita	***Arctostaphylos franciscana***	Federally Endangered CNPS Rank 1B.1	Coastal scrub (serpentine)	The closest record for this species is an historical observation (1946) approximately 2.4 miles southwest of the project site (CNDDB Occurrence No. 1) in the Laurel Hill Cemetery.	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Presidio Manzanita	***Arctostaphylos montana* ssp. *ravenii***	Federally Endangered California Endangered CNPS Rank 1B.1	Serpentinite outcroppings in chaparral, coastal prairie, and coastal scrub	The closest record for this species is located approximately 2.9 miles west of the project site (CNDDB Occurrence No. 6).	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Marsh Sandwort	***Arenaria paludicola***	Federally Endangered California Endangered CNPS Rank 1B.1	Sandy openings in marshes and swamps.	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Carlotta Hall's Lace Fern	***Aspidotis carlotta-halliae***	CNPS Rank 4.2	Usually serpentine soils in chaparral and cismontane woodland	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Ocean Bluff Milk-vetch	***Astragalus nuttallii* var. *nuttallii***	CNPS Rank 4.2	Coastal bluff scrub and coastal dunes	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Alkali Milk-vetch	***Astragalus tener* var. *tener***	CNPS Rank 1B.2	Alkaline. Playas, valley and foothill grassland, vernal pools	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Sonoma Sunshine	***Blennosperma bakeri***	Federally Endangered California Endangered CNPS Rank 1B.1	Mesic valley and foothill grasslands and vernal pools	This species has been identified by the USFWS IPac tool as occurring in the vicinity of the project site.	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Bristly Sedge	***Carex comosa***	CNPS Rank 2B.1	Coastal prairie, marshes and swamps (lake margins), and valley and foothill grassland	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.

Northern Meadow Sedge	***Carex praticola***	CNPS Rank 2B.2	Mesic meadows and seeps	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Johnny-nip	***Castilleja ambigua* var. *ambigua***	CNPS Rank 4.2	Coastal bluff scrub, coastal prairie, coastal scrub, carshes and swamps, valley and foothill grassland, and vernal pools margins	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
San Francisco Bay Spineflower	***Chorizanthe cuspidata var. cuspidata***	CNPS Rank 1B.2	Sandy. Coastal bluff scrub, coastal dunes, coastal prairie, and coastal scrub	The closest record for this species is located approximately 1.9 miles west of the project site (CNDDB Occurrence No. 24) in Chrissy Field.	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Point Reyes Salty Bird's-beak	***Chloropyron maritimum* ssp. *palustre***	CNPS Rank 1B.2	Coast salt marshes and swamps	The closest record for this species occurs approximately 2.4 miles west of the project site (CNDDB Occurrence No. 74) near Chrissy Field.	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Franciscan Thistle	***Cirsium andrewsii***	CNPS Rank 1B.2	Mesic and sometimes serpentine soils within broadleafed upland forest, coastal bluff scrub, coastal prairie, and coastal scrub	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Mt. Tamalpais thistle	***Cirsium hydrophilum* var. *vaseyi***	CNPS Rank 1B.2	Serpentinite seeps in broadleafed upland forest, chaparral, meadows and seeps	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Presidio clarkia	***Clarkia franciscana***	Federally Endangered California Endangered CNPS Rank 1B.1	Coastal scrub and serpentinite soils in valley and foothill grassland	The closest record for this species occurs approximately 2.5 miles southwest of the project site (CNDDB Occurrence No. 2) at Inspiration Point.	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Round-headed Chinese-houses	***Collinsia corymbosa***	CNPS Rank 1B.2	Coastal dunes	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
San Francisco Collinsia	***Collinsia multicolor***	CNPS Rank 1B.2	Sometimes serpentine soils in closed-cone coniferous forest and coastal scrub	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Slender Cottongrass	***Eriophorum gracile***	CNPS Rank 4.3	Acidic soils in bogs and fens, meadows and seeps, and upper montane coniferous forest	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.

San Francisco Wallflower	***Erysimum franciscanum***	CNPS Rank 4.2	Often serpentine or granitic soils in chaparral, coastal dunes, coastal scrub, and valley and foothill grassland, sometimes roadsides	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Fragrant Fritillary	***Fritillaria liliacea***	CNPS Rank 1B.2	Often serpentine. Cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Blue Coast Gilia	***Gilia capitata*** **ssp.** ***chamissonis***	CNPS Rank 1B.1	Coastal dunes and coastal scrub	The closest record for this species occurs approximately 1.4 miles southwest of the project site (CNDDB Occurrence No. 34) on Holladay Hill.	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
San Francisco Gumplant	***Grindelia hirsutula*** **var.** ***maritima***	CNPS Rank 3.2	Sandy or serpentine soils in coastal bluff scrub, coastal scrub, and valley and foothill grassland	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Dark-eyed Gilia	***Gilia millefoliata***	CNPS Rank 1B.2	Coastal dunes	The closest record for this species is an historical observation (1912) approximately 2.8 miles west of the project site (CNDDB Occurrence No. 1) in the Presidio.	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Congested-headed Hayfield Tarweed	***Hemizonia congesta*** **ssp.** ***congesta***	CNPS Rank 1B.2	Valley and foothill grasslands (sometimes roadsides)	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Marin Western Flax	***Hesperolinon congestum***	Federally Threatened California Threatened CNPS Rank 1B.1	Serpentine soils in chaparral and valley and foothill grassland	The closest record for this species located approximately 2.4 miles southwest of the project site (CNDDB Occurrence No. 14) in the Laurel Hill Cemetery.	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Water Star-grass	***Heteranthera dubia***	CNPS Rank 2B.2	Marshes and swamps (alkaline, still or slow-moving water)	The closest record for this species is an historic (1879) observation in the vicinity of the projec site (Occurrence No. 1). Exact location is unknown.	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Kellogg's Horkelia	***Horkelia cuneata*** **var.** ***sericea***	CNPS Rank 1B.1	Sandy or gravelly openings. Closed-cone coniferous forest, chaparral (maritime), coastal dunes, and coastal scrub.	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.

Coast Iris	***Iris longipetala***	CNPS Rank 4.2	Mesic soils in coastal prairie, lower montane coniferous forest, and meadows and seeps	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Beach Layia	***Layia carnosa***	Federally Endangered California Endangered CNPS Rank 1B.1	Coastal dunes and sandy coastal scrub	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
San Francisco Lessingia	***Lessingia germanorum***	Federally Endangered California Endangered CNPS Rank 1B.1	Coastal scrub (remnant dunes)	The closest record for this species occurs approximately 2.0 miles west of the project site (CNDDB Occurrence No. 8) in Chrissy Field.	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Rose Leptosiphon	***Leptosiphon rosaceus***	CNPS Rank 1B.1	Coastal bluff scrub	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Mt. Diablo Cottonweed	***Micropus amphibolus***	CNPS Rank 3.2	Rocky soils in broadleafed upland forest, chaparral, cismontane woodland, and valley and foothill grassland	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Marsh Microseris	***Microseris paludosa***	CNPS Rank 1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
White-rayed Pentachaeta	***Pentachaeta bellidiflora***	Federally Endangered California Endangered CNPS Rank 1B.1	Cismontane woodland and valley and foothill grassland (often serpentinite)	This species has been identified by the USFWS IPac tool as occurring in the vicinity of the project site.	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Choris' Popcornflower	***Plagiobothrys chorisianus var. chorisianus***	CNPS Rank 1B.2	Mesic. Chaparral, coastal prairie, and coastal scrub.	The closest record for this species is an historical observation (1902) approximately 2.5 miles west of the project site (CNDDB Occurrence No. 40) in the Presidio.	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
San Francisco Popcornflower	***Plagiobothrys diffusus***	California Endangered CNPS Rank 1B.1	Coastal prairie and valley and foothill grassland	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Oregon Polemonium	***Polemonium carneum***	CNPS Rank 2B.2	Coastal prairie, coastal scrub, lower montane coniferous forest	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.

Adobe Sanicle	***Sanicula maritima***	California Rare CNPS Rank 1B.1	Clay and serpentinite soils in chaparral, coastal prairie, meadows and seeps, and valley and foothill grassland	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
San Francisco Campion	***Silene verecunda* ssp. *verecunda***	CNPS Rank 1B.2	Sandy. Coastal bluff scrub, chaparral, coastal prairie, coastal scrub, and valley and foothill grassland	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Santa Cruz microseris	***Stebbinsoseris decipiens***	CNPS Rank 1B.2	Open areas, sometimes serpentinite soils in broadleafed upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, and valley and foothill grassland	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.
Coastal Triquetrella	***Triquetrella californica***	CNPS Rank 1B.2	Coastal bluff scrub and coastal scrub	CNPS 1-Quad Search	**None.** The urban and bay habitats present on the project site do not provide suitable habitat for this species.

Table 2. Special Status Wildlife Species Known to Occur in the Vicinity of the Project Area

Common Name	Scientific Name	Status	Habitat Type/Components	Occurrence Information	Probability of Occurring within the Project Area
American Badger	***Taxidea taxus***	California Species of Special Concern	Drier open stages of most shrub, forest, and herbaceous habitats, with friable soils	The closest record for this species is an historical observation (1936) approximately 2.8 miles southwest of the Project Area (CNDDB Occurrence No. 124) in Golden Gate Park.	**None**. The aquatic and urban habitats within the Project Area are not suitable for this species.
American Peregrine Falcon	***Falco peregrinus anatum***	California Fully Protected	Nests on high cliffs using a scrape on a depression or ledge in an open site (sometimes on human-made structures)	This species is known to occur in the vicinity of the San Francisco Bay (CNDDB Occurrence No. 51).	**None**. There are no protected ledges of sufficient height on or near the Project Area to provide roosting/nesting habitat for this species in proximity to the Project Area.
Bay Checkerspot Butterfly	***Euphydryas editha bayensis***	Federally Threatened	Serpentine grassland Host plants: *Plantago erecta*, *Castilleja densiflorus*, and *C. exserta*	This species has been identified by the USFWS IPac tool as occurring in the vicinity of the Project Area.	**None**. The aquatic and urban habitats within the Project Area are not suitable for this species.
Black Abalone	***Haliotis cracherodii***	Federally Endangered	Rocky intertidal and subtidal reefs along the California and Baja California coast	NMFS West Coast Region CA Species List for San Francisco North Quad	**None**. This species is not known to occur in the San Francisco Bay.
Blue Whale	***Balaenoptera musculus***	Federally Endangered MMPA Depleted and Protected	Open ocean, feed off the California coast during the summer	NMFS West Coast Region CA Species List for San Francisco North Quad	**None**. This species is not known to occur in the San Francisco Bay.
Common Bottlenose Dolphin	***Tursiops truncates***	MMPA Protected	Inhabit a wide variety of habitats, including harbors, bays, gulfs, and estuaries, nearshore coastal waters and open ocean	This species is known to occur within the San Francisco Bay.	**Low**. This species has been observed throughout the San Francisco Bay, but has not been observed within the Project Area boundaries. Due to the open nature of the western portion of the Project Area, it is possible that this species could occur onsite.
California Black Rail	***Laterallus jamaicensis coturniculus***	California Threatened California Fully Protected	Saline, brackish, and fresh emergent wetlands in the San Francisco Bay area and Delta, and coastal southern California	The closest record for this species is an historical observation (1887) approximately 2.4 miles west of the Project Area (CNDDB Occurrence No. 274) near Chrissy Field.	**None**. The aquatic and urban habitats within the Project Area are not suitable for this species.
California Least Tern	***Sterna antillarum browni***	Federally Endangered	Nests in colonies on relatively open beaches, forage for fish in the open water of the San Francisco Bay	This species has been identified by the USFWS IPac tool as occurring in the vicinity of the Project Area.	**None**. The aquatic and urban habitats present within the Project Area do not provide suitable nesting or foraging habitat for this species.

California Red-legged Frog	***Rana draytonii***	Federally Threatened California Species of Special Concern	Grassland and riparian habitats adjacent to creeks/streams with plunge pools or ponds	This species has been identified by the USFWS IPac tool as occurring in the vicinity of the Project Area.	**None**. The aquatic and urban habitats within the Project Area are not suitable for this species.
California Sea Lion	***Zalophus californianus***	MMPA Protected	Pelagic and nearshore waters, resting and breeding in groups of various sizes - haul out on offshore rocks, sloping rock outcroppings, sandy and cobblestone beaches, jetties, and buoys	This species is known to occur within the Project Area.	**High**. This species has been observed within the Project Area.
Callippe Silverspot Butterfly	***Speyeria callippe callippe***	Federally Endangered	Grassland Host plant: *Viola pedunculata*	This species has been identified by the USFWS IPac tool as occurring in the vicinity of the Project Area.	**None**. The aquatic and urban habitats within the Project Area are not suitable for this species.
Chinook Salmon - Sacramento River Winter Run ESU	***Oncorhynchus tshawytscha***	Federally Endangered California Endangered	Migrate from the open ocean, through the San Francisco Bay and into the Sacramento River, spawning in the upper mainstem Sacramento River	NMFS West Coast Region CA Species List for San Francisco North Quad	**Low**. While it is unlikely that this species would intentionally enter the Project Area to forage, due to the site's location within the Central Bay, it is possible that this species could be found within the Project Area boundaries as a result of tidal interference with individuals' migration.
Chinook Salmon - Central Valley Fall and Late-Fall Run ESU	***Oncorhynchus tshawytscha***	California Species of Special Concern	Migrate from the open ocean, through the San Francisco Bay and into the in the Sacramento and San Joaquin River Basins and their tributaries, spawning in the lower, middle, and upper Sacramento River	This species is known to occur within the San Francisco Bay.	**Low.** While it is unlikely that this species would intentionally enter the Project Area to forage, due to the site's location within the Central Bay, it is possible that this species could be found within the Project Area boundaries as a result of tidal interference with individuals' migration.
Chinook Salmon - Central Valley Spring Run ESU	***Oncorhynchus tshawytscha***	Federally Threatened California Threatened	Migrate from the open ocean, through the San Francisco Bay and into the Sacramento River to spawn - also spring-run Chinook salmon from the Feather River Hatchery Spring-run Chinook Program	NMFS West Coast Region CA Species List for San Francisco North Quad	**Low**. While it is unlikely that this species would intentionally enter the Project Area to forage, due to the site's location within the Central Bay, it is possible that this species could be found within the Project Area boundaries as a result of tidal interference with individuals' migration.

Coho Salmon - Central California Coast ESU	***Oncorhynchus kisutch***	Federally Endangered	Spawn from streams and freshwater tributaries to estuarine and marine waters of the Pacific Ocean, from Punta Gorda, CA to Aptos Creek, including the San Francisco Bay and tributaries.	NMFS West Coast Region CA Species List for San Francisco North Quad	**None**. Only two creeks that flow into north central San Francisco Bay, Arroyo Corte Madera del Presidio and Corte Madera (Marin County), currently support coho salmon. Individuals migrating to or from these creeks would likely transit through the north side of the Central Bay, and are unlikely to be present within the Project Area.
Delta Smelt	***Hypomesus transpacificus***	Federally Threatened California Endangered	Upper San Francisco Estuary - Suisun Bay upstream to the City of Sacramento within the Sacramento River and tributaries.	This species has been identified by the USFWS IPac tool as occurring in the vicinity of the Project Area.	**None**. This species is not known to occur in the San Francisco Bay.
Dungeness Crab	***Cancer magister***	CDFW Managed	Ranges from the eastern Aleutian Islands, Alaska to Santa Barbara, California, Within the San Francisco Bay, crabs concregate in tidal and navigational channals in early summer and spreading to mudflats and protected shorelines to grow before migrating into coastal waters.	This species is known to occur within the San Francisco Bay.	**Moderate.** The Project Area provides suitable habitat for this species, which is known to occur within the Central San Francisco Bay.
English sole	***Parophrys vetulus***	MSA Managed	Ranges from Baja California to the Aleutians in southern Alaska. Adults live in deep waters, inhabiting sand and mud bottoms. Juveniles live in nearshore habitats then migrate to deeper waters. Can be found in eelgrass beds.	This species is known to occur within the San Francisco Bay.	**Low**. It is unlikely that this species would intentially enter the Project Area to forage due to location within a highly trafficked port and the presence of marginal habitat. However, due to the site's location within the Central Bay, it is possible that this species could be found within the Project Area.
Fin Whale	***Balaenoptera physalus***	Federally Endangered	Deep, offshore waters, away from the coast.	NMFS West Coast Region CA Species List for San Francisco North Quad	**None**. This species is not known to occur in the San Francisco Bay.
Gray whale	***Eschrichtius robustus***	Federally Endangered MMPA Depleted and Protected	Shallow coastal waters in the North Pacific Ocean	This species is known to occur within the San Francisco Bay.	**Very Low**. The busy, shallow, and protected nature of the Project Area does not provide suitable habitat nor access for this species.
Green Sea Turtle - East Pacific DPS	***Chelonia mydas***	Federally Threatened	Nearshore as well as in bays and lagoons, on reefs, and especially in areas with seagrass beds in southern California and Mexico.	NMFS West Coast Region CA Species List for San Francisco North Quad	**None**. This species is not known to occur in the San Francisco Bay. Further, the Project Area does not provide suitable nesting or foraging habitat.

Green Sturgeon - Southern DPS	***Acipenser medirostris***	Federally Threatened	Riverine, estuarine, and marine habitats along the west coast of North America - regionally entering San Francisco Bay and spawning in the Sacramento River	NMFS West Coast Region CA Species List for San Francisco North Quad	**Low**. While it is unlikely that this species would intentionally enter the Project Area to forage, due to the site's location within the Central Bay, it is possible that this species could be found within the Project Area boundaries as a result of tidal interference with individuals' migration.
Guadalupe Fur Seal	***Arctocephalus townsendi***	Federally Threatened California Threatened and Fully Protected MMPA Depleted and Protected	Shallow, nearshore waters, prefering cool and sheltered rocky habitats along steep shelving shorelines - haul out on rock platforms with access to water and in sea caves.	NMFS West Coast Region CA Species List for San Francisco North Quad	**None**. This species is not known to occur in the San Francisco Bay.
Harbor porpoise	***Phocoena phocoena***	MMPA Protected	Coastal areas - most commonly found in bays, estuaries, harbors, and fjords	This species is known to occur within the San Francisco Bay.	**Low**. This species is known to shy away from human presence and stay within open waters, and would thus likely avoid the Project Area occuring within a heavily trafficked port.
Humpback Whale	***Megaptera novaeangliae***	Federally Endangered MMPA Depleted and Protected	Throughout the world's open oceans, regionally feed along the California coast, rarely entering the San Francisco Bay	This species is known to occur within the San Francisco Bay.	**Very Low.** The busy, shallow, and protected nature of the Project Area does not provide suitable habitat nor access for this species.
Jacksmelt	***Atherinopsis californiensis***	MSA Managed	Ranges from Baja California to Oregon, occupying marine and estuarine habitats. Adults can be found in the San Francisco Bay year round.	This species is known to occur within the San Francisco Bay.	**Low**. It is unlikely that this species would intentially enter the Project Area to forage due to location within a highly trafficked port and the presence of marginal habitat. However, due to the site's location within the Central Bay, it is possible that this species could be found within the Project Area.
Killer Whale - Southern Resident	***Orcinus orca***	Federally Endangered MMPA Depleted and Protected	Open ocean, with transient whales often observed in coastal waters	NMFS West Coast Region CA Species List for San Francisco North Quad	**None**. This species is not known to occur in the San Francisco Bay.
Leatherback Sea Turtle	***Dermochelys coriacea***	Federally Endangered	Open ocean, occasionally entering bays and estruaries, primarily in tropical waters, but move into temperate waters during the summer. Carnivorous species consuming soft-bodied open ocean prey.	NMFS West Coast Region CA Species List for San Francisco North Quad	**None**. This species is not known to occur in the San Francisco Bay. Further, the Project Area does not provide suitable nesting or foraging habitat.

Longfin Smelt	***Spirinchus thaleichthys***	Federal Candidate Species California Threatened	Open waters within Northern California bay, estuary, and nearshore coastal environments, migrating into freshwater rivers to spawn.	This species is known to occur within the San Francisco Bay (CNDDB Occurrence No. 24).	**Low**. This species is known to occur within the San Francisco Central Bay, however this species is largely pelagic and is unlikely to enter the Project Area waters.
Mission Blue Butterfly	***Icaricia icarioides missionensis***	Federally Endangered	Coastal chaparral and grassland Host plants: *Lupinus albifrons, L. variicolor*, and *L. formosus*	This species has been identified by the USFWS IPac tool as occurring in the vicinity of the Project Area.	**None**. The aquatic and urban habitats within the Project Area are not suitable for this species.
Monarch - California Overwintering Population	***Danaus plexippus plexippus***	Federal Candidate	Generally overwinter in stands of exotic eucalyptus (*Eucalyptus* sp.), Monterey cypress (*Hesperocyparis macrocarpa*), Monterey pine (*Pinus radiata*), and western sycamore trees (*Platanus racemosa*).	The closest record for this species' overwintering population is located approximately 0.7 mile west of the Project Area (CNDDB Occurrence No. 239).	**None**. The aquatic and urban habitats within the Project Area are not suitable for this species.
North Pacific Loggerhead Sea Turtle	***Caretta caretta***	Federally Endangered	Open oceans with juveniles observed off of coastal California. Carnivorous species with adults primarily consuming bottom-dwelling invertebrates.	NMFS West Coast Region CA Species List for San Francisco North Quad	**None**. This species is not known to occur in the San Francisco Bay. Further, the Project Area does not provide suitable nesting or foraging habitat.
North Pacific Right Whale	***Eubalaena japonica***	Federally Endangered MMPA Depleted and Protected	Open ocean and coastal waters thorughout temperate to subpolar latitudes of the Pacific Ocean	NMFS West Coast Region CA Species List for San Francisco North Quad	**None**. This species is not known to occur in the San Francisco Bay.
Northern Anchovy	***Engraulis mordax***	MSA Managed	Central subpopulation ranges from San Francisco (including the Bay), California, to Punta Baja, Mexico. Near shore and epipelagic species, with larvae occurring 0-50 meters in depth, and adults occurring 70-200 m in depth.	This species is known to occur within the San Francisco Bay.	**Low**. It is unlikely that this species would intentially enter the Project Area to forage due to location within a highly trafficked port and the presence of marginal habitat. However, due to the site's location within the Central Bay, it is possible that this species could be found within the Project Area.
Northern Elephant Seal	***Mirounga angustirostris***	MMPA Protected	Pelagic waters along the coast and abundant on California islands, breed in winter in dense rookeries primarily on coastal islands, on isolated/protected beaches.	This species has been observed in the San Francsico Bay.	**Very Low.** The presence of northern elephant seals is a rare occurrence within and/or near the San Francisco Bay. The Project Area does not provide suitable haul-out locations for this species. It is highly unlikely that this species would enter the Project Area.

Northern Fur Seal	***Callorhinus ursinus***	MMPA Depleted	Pelagic waters along the coast and primarily on coastal islands, occuring in dense rookeries - haul out on offshore rocks, sloping rock outcroppings and sandy or cobble beaches.	This species has been documented in the San Francsico Bay.	**Very Low**. The presence of northern fur seals is a rare occurrence within and/or near the San Francisco Bay, with generally only sick or emaciated juveniles entering the bay. The Project Area does not provide suitable haul-out locations for this species. It is highly unlikely that this species would enter the Project Area.
Olive Ridley Sea Turtle	***Lepidochelys olivacea***	Federally Endangered	Open ocean, occasionally coastal areas, including bays and estuaries. Omnivorous species eating primarily small vertebrates and invertebrates.	NMFS West Coast Region CA Species List for San Francisco North Quad	**None**. This species is not known to occur in the San Francisco Bay. Further, the Project Area does not provide suitable nesting or foraging habitat.
Olympia Oyster	***Ostrea lurida***	MSA Managed	Estuaries and bays, ranging from Baja California to Southern Alaska. Grows on hard surfaces in intertidal areas.	This species is known to occur within the San Francisco Bay.	**Moderate.** The Project Area provides suitable habitat for this species, which is known to occur within the Central San Francisco Bay.
Pacific (chub) Mackerel	***Scomber japonicus***	MSA Managed	Ranges from the Gulf of California to the Alaska. Pelagic species found from surface to 100 in depth.	This species is known to occur within the San Francisco Bay.	**Low**. It is unlikely that this species would intentially enter the Project Area to forage due to location within a highly trafficked port and the presence of marginal habitat. However, due to the site's location within the Central Bay, it is possible that this species could be found within the Project Area.
Pacific Harbor Seal	***Phoca vitulina***	MMPA Protected	Found along the California coast and within the San Francisco Bay - haul-out sites include beaches, mudflats and rocky outcroppings exposed only at low tide, and wetlands covered with vegetation	This species is known to occur within the San Francisco Bay.	**High**. This species has been observed within the Project Area.
Pacific Herring	***Clupea pallasii***	CDFW Managed MSA Managed	Found in large schools throughout the California's coastal zone and are an important forage species in San Francisco Bay. Primarily found off shore, but moves into bays and estuaries in the winter to lay their eggs.	This species is known to occur within the San Francisco Bay.	**High**. The San Francisco waterfront has been consistently used by Pacific herring since at least 1973.

Pacific Jack Mackerel	***Trachurus symmetricus***	MSA Managed	Ranges from Baja California to the Aleutian Islands. Typically found in schools over rocky bottoms or associated with kelp.	This species is known to occur within the San Francisco Bay.	**Low**. It is unlikely that this species would intentially enter the Project Area to forage due to location within a highly trafficked port and the presence of marginal habitat. However, due to the site's location within the Central Bay, it is possible that this species could be found within the Project Area.
Pacific Sardine	***Sardinops sagax***	MSA Managed	Ranges from the Gulf of California to the Aleutian Islands. Found in schools over rocky bottoms or associated with kelp.	This species is known to occur within the San Francisco Bay.	**Low**. It is unlikely that this species would intentially enter the Project Area to forage due to location within a highly trafficked port and the presence of marginal habitat. However, due to the site's location within the Central Bay, it is possible that this species could be found within the Project Area.
Ridgway's Rail	***Rallus obsoletus***	Federally Endangered California Endangered California Fully Protected	Coastal wetlands and brackish areas	This species has been identified by the USFWS IPac tool as occurring in the vicinity of the Project Area.	**None**. The aquatic and urban habitats within the Project Area are not suitable for this species.
Salt-Marsh Harvest Mouse	***Reithrodontomys raviventris raviventris***	Federally Endangered California Endangered, Fully Protected	Saline emergent wetland and tidal marsh habitats with pickleweed *(Salicornia* sp.).	This species has been identified by the USFWS IPac tool as occurring in the vicinity of the Project Area.	**None**. The aquatic and urban habitats within the Project Area are not suitable for this species.
San Bruno Elfin Butterfly	***Callophrys mossii bayensis***	Federally Endangered	Coastal scrub and rocky outcrops and cliffs	This species has been identified by the USFWS IPac tool as occurring in the vicinity of the Project Area.	**None**. The aquatic and urban habitats within the Project Area are not suitable for this species.
Sei Whale	***Balaenoptera borealis***	Federally Endangered MMPA Depleted and Protected	Typically observed in deeper waters far from the coastline in subtropical, temperate, and subpolar waters around the world	NMFS West Coast Region CA Species List for San Francisco North Quad	**None**. This species is not known to occur in the San Francisco Bay.
Short-tailed Albatross	***Phoebastria albatrus***	Federally Endangered California Species of Special Concern	Nest on islands in Japan and Hawaii. Travels and forages in open waters along the Pacific coast of the U.S. towards the Berring Sea.	This species has been identified by the USFWS IPac tool as occurring in the vicinity of the Project Area.	**None**. The aquatic and urban habitats present within the Project Area do not provide suitable nesting or foraging habitat for this species.
Southern Sea Otter	***Enhydra lutris nereis***	Federally Threatened California Fully Protected MMPA Depleted and Protected	Nearshore marine environments of California from Ano Nuevo, San Mateo Co. to Point Sal, Santa Barbara Co	This species has been identified by the USFWS IPac tool as occurring in the vicinity of the Project Area.	**None.** This species is not known to occur in the San Francisco Bay.

Sperm Whale	***Physeter macrocephalus***	Federally Endangered MMPA Depleted and Protected	Open oceans throughout the world - observed in California waters off the continental slope	NMFS West Coast Region CA Species List for San Francisco North Quad	**None**. This species is not known to occur in the San Francisco Bay.
Steelhead - California Central Valley DPS	***Oncorhynchus mykiss***	Federally Threatened	All naturally spawned populations in the Sacramento and San Joaquin Rivers and their tributaries, excluding steelhead from San Francisco Bay and San Pablo Bays and their tributaries	NMFS West Coast Region CA Species List for San Francisco North Quad	**Low**. Critical habitat is present within the Project Area boundaries, but the BSA is not within the spawning range of this DPS. As an anadromous fish, this DPS occurs in San Francisco Bay when migrating to natal spawning streams in the Central Valley.
Steelhead - Central California Coast DPS	***Oncorhynchus mykiss***	Federally Threatened	Permanent coastal streams, and/or lagoons below natural and manmade barriers from the Russian River (Sonoma Co.) south to Aptos Creek (Santa Cruz Co.), and the drainages of San Francisco Bay eastward to the Napa River (inclusive), excluding the Sacramento-San Joaquin River Basin	NMFS West Coast Region CA Species List for San Francisco North Quad	**Low**. While it is unlikely that this species would intentially enter the Project Area to forage, due to the site's location within the Central Bay, it is possible that this species could be found within the Project Area boundaries as a result of tidal interference with individuals' migration.
Stellar Sea Lion - Eastern DPS	***Eumetopias jubatus***	MMPA Protected, Depleted, and Strategic	Coastal waters of the North Pacific Ocean, generally congregating on isolated islands. Locally these species are found primarily around the Fallaron Islands.	This species has been observed in the San Francsico Bay.	**Very Low**. While this species generally not known to occur within the San Francisco Bay, an individual of this species has been observed hauling out at Peir 39.
Tidewater Goby	***Eucyclogobius newberryi***	Federally Endangered California Species of Special Concern	Brackish, shallow lagoons, and lower stream reaches with low salt levels along the Pacific coast of California from the Smith River in Del Norte County to Agua Hedionda Lagoon in San Diego County.	This species has been identified by the USFWS IPac tool as occurring in the vicinity of the Project Area.	**None.** This species is presumed extirpated from the San Francisco Bay.
Western Snowy Plover	***Charadrius nivosus nivosus***	Federally Endangered California Species of Special Concern	Nests on coastal beaches, sand spits, dune-backed beaches, sparsely-vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries from southern Washington to Baja California.	This species has been identified by the USFWS IPac tool as occurring in the vicinity of the Project Area.	**None**. The aquatic and urban habitats within the Project Area are not suitable for this species.

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APPENDIX B

Consistency with BCDC Bay Plan Policies Applicable to Biological Resources	
Fish, Other Aquatic Organisms and Wildlife, Policy 2: To assure the benefits of fish, other aquatic organisms and wildlife for future generations, to the greatest extent feasible, the Bay's tidal marshes, tidal flats, and subtidal habitat should be conserved, restored and increased.	**Consistent:** The purpose of the project is to remediate (i.e., clean up) sediments impacted with PAHs, within the Project Area, to protect human health and the environment.
Water Surface Area and Volume, Policy 1: The surface area of the Bay and the total volume of water should be kept as large as possible in order to maximize active oxygen interchange, vigorous circulation, and effective tidal action. Filling and diking that reduce surface area and water volume should therefore be allowed only for purposes providing substantial public benefits and only if there is no reasonable alternative.	**Consistent:** The proposed remediation efforts would include the removal of approximately 88,000 cubic yards of impacted sediment and debris from the Project Area and the placement of approximately 51,500 cubic yards of clean fill associated with the capping and/or armoring efforts. The proposed project would result in no net fill of the Bay (i.e., net removal of 34,800 cubic yards or impacted sediment and/or debris). Surface Area would not be changed.
Water Surface Area and Volume, Policy 2: Water circulation in the Bay should be maintained, and improved as much as possible. Any proposed fills, dikes, or piers should be thoroughly evaluated to determine their effects upon water circulation and then modified as necessary to improve circulation or at least to minimize any harmful effects.	**Consistent:** No change in marina configuration is proposed. Although structures would be temporarily moved to facilitate dredging, no new structures are proposed. Water circulation should therefore not change.
Subtidal Areas, Policy 1: Any proposed filling or dredging project in a subtidal area should be thoroughly evaluated to determine the local and Bay-wide effects of the project on: (a) the possible introduction or spread of invasive species; (b) tidal hydrology and sediment movement; (c) fish, other aquatic organisms and wildlife; (d) aquatic plants; and (e) the Bay's bathymetry. Projects in subtidal areas should be designed to minimize and, if feasible, avoid any harmful effects.	**Consistent:** Implementation of an approved Marine Invasive Species Control Plan would be incorporated into the Project's Contract Documents. Erosive forces within the Marina have been considered during cap design engineering to ensure tidal hydrology and sediment movement would not interfere with future cap effectiveness. The remediation is designed to improve habitat for fish, aquatic organisms and to protect wildlife.