Final

ENVIRONMENTAL ASSESSMENT
Naval Base Point Loma (NBPL)
Fuel Pier Replacement and Dredging
(P-151/DESC1306)
San Diego, California

June 2013

NAVSUP
NAVAL SUPPLY SYSTEMS COMMAND
FLEET LOGISTICS CENTER
SAN DIEGO

Navy Region Southwest
One Team, One Voice, One Mission

NAVAL BASE POINT LOMA

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Acronyms and Abbreviations

µg/kg	microgram per kilogram
$\mu g/m^3$	micrograms per cubic meter
µm	micron(s)
µPa	microPascal
ac	acre
ACM	asbestos-containing material
ADT	Average Daily Traffic
AMEC	AMEC Earth & Environmental, Inc.
ANSI	American National Standard Institute
APE	Area of Potential Effect
BLS	U.S. Bureau of Labor Statistics
BMP	Best Management Practice
C & D	construction and demolition (waste)
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CASHPO	California State Historic Preservation Officer
CATEX	Categorical Exclusion
CCC	California Coastal Commission
CCR	California Code of Regulations
CD	(CCC) Consistency Determination
CDC	Child Development Center
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CH3D	Curvilinear Hydrodynamics in Three Dimensions
CH_4	methane
CNEL	Community noise equivalent level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CPP	contaminated petroleum product
CRFS	California Recreational Fishing Survey
CSLC	California State Lands Commission
CV	coefficient of variation
CWA	Clean Water Act
cy	cubic yards
CZMA	Coastal Zone Management Act
dB	decibel
dBA	A-weighted decibel
DEH	Department of Environmental Health
DFM	diesel fuel marine
DFSP	Defense Fuel Support Point
DHS	Department of Homeland Security
DMM	discarded military munitions
DoD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Executive Order
EOD	Explosive Ordnance Disposal
EPCRA	Emergency Planning and Community Right-to-Know Act
ERL	effects range low
ERM	effects range median
ESA	Endangered Species Act
ESQD	Explosives Safety Quantity Distances
ESS DR	Explosives Safety Submission Determination Request
ESS	Explosives Safety Submission
FICUN	Federal Interagency Committee on Urban Noise
FLC	Fleet Logistics Center
FMP	Fishery Management Plan
FONSI	Finding of No Significant Impact
FOR	Fuel Oil Reclamation
ft	feet/foot
FY	fiscal year
GHG	greenhouse gas
GIS	geographic information system
HAP	hazardous air pollutants
HAPC	Habitat Area of Particular Concern
hp	horsepower
Hz	hertz
I-	Interstate
ICP	Integrated Contingency Plan
IHA	Incidental Harassment Authorization
IMPLAN	Impact Analysis for Planning
in	inch
INRMP	Integrated Natural Resources Management Plan
IR	Installation Restoration
JP-5	jet fuel
kHz	kilohertz
km	kilometers
km^2	square kilometers
LBP	lead-based paint
Ldn	Day-night average sound level
LDUUV	Large Displacement Unmanned Undersea Vehicle (Program)
Leq	Energy equivalent levels
lf	linear feet
Lmax	maximum sound level
LOS	Level of Service
LPD	landing platform dock
m	meter(s)
MBTA	Migratory Bird Treaty Act
Metro PA	Metro San Diego Programmatic Agreement
mg/L	milligrams per liter

mg/m^3	milligrams per cubic meter
mi	mile(s)
MILCON	Military Construction
ml	milliliter
MLLW	Mean Lower Low Water
MMO	marine mammal observer
MMP	Marine Mammal Program
MMPA	Marine Mammal Protection Act
MNB	Moffatt & Nichol-Blaylock
MOTEMS	Marine Oil Terminal Engineering and Maintenance Standards
MOU	Memorandum of Understanding
MPN	most probable number
MSDS	Material Safety Data Sheet
MWR	Morale, Welfare, and Recreation
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standard
NAB	Naval Amphibious Base
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NAVSUP	Naval Supply Systems Command
NB	North Bay
NBC	Naval Base Coronado
NBPL	Naval Base Point Loma
NBSD	Naval Base San Diego
NEPA	National Environmental Policy Act
NMAWC	Naval Mine and Anti-Submarine Warfare Command
NMFS	National Marine Fisheries Service
NMSDD	Navy Marine Species Density Database
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOSSA	Naval Ordnance Safety and Security Activity
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRSW	Navy Region Southwest
NSR	New Source Review
NTC	Naval Training Center
NTU	nephelometric turbidity units
O_3	ozone
OPNAVINST	Chief of Naval Operations Instruction
PAH	polycyclic aromatic hydrocarbons
Pb	lead
PCB	polychlorinated biphenyl
PFMC	Pacific Fishery Management Council
PLECA	Point Loma Ecological Conservation Area
PM_{10}	particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in diameter
ppe	personal protective equipment
ppm	parts per million
RA	Relocation Area
RCNM	Roadway Construction Noise Model
RCRA	Resource Conservation and Recovery Act
REC-1	waters designated for contact recreation beneficial uses
RHA	Rivers and Harbors Act
rms	root-mean square
ROG	reactive organic gases
ROI	region of influence
ROI	region of influence
RONA	Record of Non-Applicability
RWQCB	Regional Water Quality Control Board
SANDAG	San Diego Association of Governments
SCB	Southern California Bight
SCM	special conservation measure
SDAB	San Diego Air Basin
SDCAPCD	San Diego Air Pollution Control District
SDCDEH	County of San Diego Department of Environmental Health
SDUPD	San Diego Unified Port District
SEL	sound exposure level
sf	square feet
SIO	Scripps Institution of Oceanography
SIP	State Implementation Plan
SISS	Swimmer Interdiction Security System
SO_2	sulfur dioxide
SOx	sulfur oxide
SPL	sound pressure level
SSC	Space and Naval Warfare Systems Center
SSTC	Silver Strand Training Complex
SSTC-S	Silver Strand Training Complex - South
SWRCB	State Water Resources Control Board
T-AKE	Dry cargo and ammunition resupply vessel
T-AKR	Large, medium speed roll-on/roll-off ship
T-AO	Military sealift replenishment "oiler" vessel
T-AOE	Fast combat support ship
TDI	Tierra Data, Inc.
TL	transmission loss
TSS	total suspended solids
TTS	temporary threshold shift
U.S.	United States
UCSD	University of California San Diego
UFC	Unified Facilities Criteria
USACE	United States Army Corps of Engineers
USC	United States Code
USCG	United States Coast Guard
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USMC	United States Marine Corps
UST	underground storage tank
UWR	Universal Waste Rule
V/C	volume to capacity
VOC	volatile organic compound
WMP	Waste Management Plan
WSDOT	Washington State Department of Transportation
ZOI	Zone of Influence

DRAFT ENVIRONMENTAL ASSESSMENT
NAVAL BASE POINT LOMA (NBPL)
FUEL PIER REPLACEMENT AND DREDGING (P-151/DESC1306)
SAN DIEGO, CALIFORNIA

ABSTRACT

The United States (U.S.) Navy has prepared this Environmental Assessment (EA) in accordance with the 1969 National Environmental Policy Act (NEPA) (42 United States Code [USC] § 4321, as amended), The Council on Environmental Quality (CEQ) Regulations for Implementing NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), and the Chief of Naval Operations Instructions for Implementing NEPA (OPNAVINST 5090.1C, CH-1).

The EA addresses the issues related to the current deficiencies of the existing Naval Base Point Loma (NBPL) Fuel Pier (Pier 180). It evaluates the environmental effects of two action alternatives that would correct the deficiencies and provide for the fueling needs of existing and future Navy ships. A No-Action Alternative is also evaluated.

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EXECUTIVE SUMMARY

This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] § 4321, as amended); the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (Title 40 Code of Federal Regulations [CFR] §§ 1500-1508, 1 July 1986); and Navy Procedures for Implementing NEPA (32 CFR § 775).

The United States (U.S.) Navy proposes to demolish the aging and seismically deficient Fuel Pier (Pier 180) at Naval Base Point Loma (NBPL), construct a new enhanced Fuel Pier with optimum capability to support current and projected fueling needs of the Navy and Department of Homeland Security (DHS), and perform associated dredging. Project demolition, construction, and dredging would occur simultaneously during an approximately 4-year period starting in September 2013 and ending in January 2017.

This EA addresses the potential environmental impacts of Alternative 1, Alternative 2, and the No-Action Alternative.

PURPOSE AND NEED FOR THE PROPOSED PROJECT (ALSO REFERRED TO HEREIN AS THE PROPOSED ACTION)

The fuel pier at NBPL is critical to the mission of the Navy and is the largest active Navy fueling facility in the southwest region. More than 42 million gallons of fuel are stored at Naval Supply Systems Command (NAVSUP) Fleet Logistics Center (FLC) Fuel Facility and more than 11 million gallons of fuel are issued and received every month to an average of 43 ships including the Military Sealift Command, Expeditionary Warfare Training Groups, three carrier strike groups, National Oceanic and Atmospheric Administration (NOAA), DHS, foreign, and small craft.

The proposed project is needed to provide improved safety features and improved fuel receipt and delivery capability at the FLC Fuel Facility NBPL to service existing and future classes of naval vessels. As described in Section 1.1, *Introduction/Background*, there is a need for this project because: (1) portions of the existing fuel pier are over 100 years old and past designed service life; (2) the existing fuel pier is not consistent with the modern standards (including seismic safety standards) set out in the California State Lands Commission (CSLC) Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) regulations; (3) the existing fuel pier lacks adequate deep water berthing capability, thus cannot safely accommodate all of the existing and future classes of vessels; (4) portions of the existing turning basin are too shallow to safely accommodate current and future deep draft berthing capabilities; (5) improved fueling features and capabilities are needed to service the current and projected future demand of vessels, which is expected to increase by 30 to 35 percent by 2018; and (6) Navy and DHS need adequate and safe ship fueling facilities now and in the future to accomplish their missions of security and national defense.

The purpose of the proposed project is to replace the aging, seismically deficient, and increasingly dysfunctional and obsolete fuel pier (Pier 180) at NBPL with a new pier that would meet CSLC MOTEMS, meet projected ship fueling requirements, and enable the Navy and DHS to meet their national security and defense missions.

ALTERNATIVE 1 PIER REPLACEMENT AND ASSOCIATED DREDGING

The scope of Alternative 1 would include the five key elements listed below.

- ***Temporary Relocation of the Navy Marine Mammal Program (MMP) –*** Before the pier replacement activities begin, the Navy MMP would be temporarily relocated to the Naval Mine and Anti-Submarine Warfare Command (NMAWC), part of NBPL that is over 3 kilometers (km) away from the fuel pier. Limited construction at NMAWC would occur and Navy marine mammal enclosures would be towed from the existing facilities to the temporary NMAWC site. After completion of the new fuel pier, the Navy marine mammal enclosures and animals would be moved back to their original location adjacent to the fuel pier and the temporary facilities at NMAWC would be removed.
- ***Phased Demolition and Removal of the Existing Fuel Pier –*** Demolition and removal of the existing fuel pier would take place in two phases to maintain the fueling capabilities of the existing fuel pier while the new pier is being constructed.
- ***Phased Construction of a Replacement Fuel Pier –*** A new, double-deck fuel pier would be constructed that would provide flexibility in fueling multiple vessel types, meet MOTEMS requirements for seismic performance, and have a total area that is 5,315 square feet (sf)/0.12 acre (ac) smaller than the area of the existing fuel pier. There would be no pile driving or other in-water construction or demolition during the least tern breeding season (from 1 April through 15 September) of each year that the project is ongoing. Due to these restrictions on in-water construction, pile driving could take up to 3 years to complete.
- ***Regulated Navigation Zones –*** The existing U.S. Coast Guard (USCG) Security Zone would be amended as needed to provide adequate security zone to the east for the proposed new fuel pier alignment. A temporary Security Zone would be established to a distance of 100 feet (ft) offshore from the proposed temporary Navy marine mammal relocation site at NMAWC for the period that the Navy marine mammals are present.
- ***Dredging and Sediment Disposal –*** Dredging and sediment disposal are needed to deepen an existing turning basin, so that the basin can safely accommodate current and future deep draft berthing capabilities. Ocean disposal of dredge sediments was considered and approved by the U.S. Environmental Protection Agency (USEPA) and U.S. Army Corps of Engineers (USACE), but USEPA specified beneficial reuse for nearshore replenishment as the appropriate placement. The dredged sediments would be disposed in the nearshore area at Naval Amphibious Base (NAB) Coronado Silver Strand Training Complex (SSTC). Under Alternative 1, dredging could be done before, during, or shortly after the pier replacement effort and could potentially occur while the Navy MMP is at its existing location, so long as pier replacement has not begun. It is anticipated that dredging would take approximately 3 months to complete. However,

there would be no dredging during the California least tern breeding season, 1 April to 15 September.

Although not an element of the P-151 NBPL Fuel Pier Replacement Project, the P-151 EA addresses the temporary relocation of the Everingham Brothers San Diego Bay bait barges during the portion of each project year when pile driving is occurring (generally between 16 September 16 and 31). The Navy is not relocating the bait barges. The viable bait barge relocation options and potential environmental impacts of relocating the bait barges are discussed in this EA. Following adoption of a Finding of No Significant Impact (FONSI) for this project, the Everingham Brothers Bait Company and the CSLC would be expected to execute a lease for a temporary relocation site.

ALTERNATIVE 2 DELAYED DREDGING ALTERNATIVE

Implementation of Alternative 2 would be the same as described under Alternative 1, except that dredging would occur years after completion of the fuel pier replacement effort, independent of the pier replacement demolition and construction and independent of the Navy marine mammal relocation. There would be no dredging during the California least tern breeding season (Apri1 1 to September 15) while the project is ongoing. As with Alternative 1, it is anticipated that dredging would take approximately 3 months to complete and the dredged material would be transported the SSTC beach beneficial reuse area and deposited in the nearshore zone. As with Alternative 1, after completion of the replacement fuel pier, the Navy marine mammal enclosures would be moved back to their current site. The Navy marine mammal relocation period is required only for the duration of demolition and construction activities. The same temporary relocation of the Everingham Brothers Bait Company bait barges as described for Alternative 1 would occur under Alternative 2.

PREFERRED ALTERNATIVE

The Navy has identified Alternative 1 (Pier Replacement and Associated Dredging) as the Preferred Alternative.

NO-ACTION ALTERNATIVE

Under the No-Action Alternative, the Navy would not implement the demolition of the existing Fuel Pier, construction of the new fuel pier facility, or dredging activities. The seismic structural deficiencies of the existing fuel pier would remain out of conformance with the current MOTEMS. Notwithstanding the remaining seismic deficiencies, current and future demand for a fuel pier to safely accommodate deep draft vessels would not be met. Under the No-Action Alternative, the Navy MMP would not be temporarily relocated to NMAWC and the two Everingham Brothers Bait Company San Diego Bay bait barges would not be temporarily relocated. Although the fuel pier itself would not be demolished, Buildings 110 and 140 on the existing pier would be taken down, and a new onshore control tower would be constructed as part of military construction project P-401, an on-going project that is modernizing the existing FLC Fuel Facility Point Loma bulk fuel storage and distribution facility.

The No-Action Alternative is not considered a reasonable alternative because it does not meet the purpose of and need for the Project as required under the CEQ regulations (40 CFR 1502.14[d]). However, it does provide a measure of the baseline conditions described in Chapter 3, against which the potential adverse impacts of the Project can be compared.

AGENCY CORRESPONDENCE AND PUBLIC INVOLVEMENT

Regulatory agencies participating in this project include USEPA, USACE, USFWS, NMFS, RWQCB, CSLC, USCG, and the CCC as described in Section 1.6. Appendix A documents the correspondence between the Navy and the regulatory agencies involved in this project.

Regarding the public involvement process, a public meeting notice was published in the San Diego Union Tribune on 28 April 2012 that initiated a 30-day public scoping period. The 30-day public scoping period began on 28 April 2012 and ended on 28 May 2012. A public meeting was held on 3 May 2012 at the Loma Portal Elementary School. A Notice of Availability (NOA) for the Draft EA was published in in the San Diego Union Tribune on 20 October 2012 to initiate a 30-day public review of the Draft EA. The public review period of the Draft EA was 30 days beginning on 20 October 2012 and ending on 19 November 2012. A public meeting was held on 14 November 2012 at Portuguese Hall, San Diego. The Draft EA was made available to the public via the Navy website at www.piersystem.com/go/doc/4275/1355631/ and at the following local libraries: San Diego Central Library, Point Loma/Hervey Branch Library, and Ocean Beach Branch Library. Appendix B of this EA contains concerns raised by the public during the scoping and Draft EA public review periods, public comments received on the Draft EA, and responses to the comments. The FONSI/FEA were made available to the public at the Point Loma/Hervey Branch, Ocean Beach Branch, and Pacific Beach/Taylor public libraries and via the Navy website: www.piersystem.com/go/doc/4275/1355631/.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Potential environmental impacts have been analyzed for the following resources: biological resource habitats and communities; fisheries; birds; marine mammals; threatened and endangered species; water resources; hazardous materials and wastes; noise; air quality; transportation and circulation; and socioeconomics and environmental justice. Table ES-1 summarizes determinations of environmental consequences followed by the respective avoidance and minimization measures/special conservation measures (SCMs) for Alternative 1, Alternative 2, and the No-Action Alternative. Chapter 3 provides a detailed discussion of the environmental consequences. As described in Table ES-1, implementation of Alternative 1, Alternative 2, or the No-Action Alternative would not result in significant impacts to any resource area.

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
Biological Resource Habitats and Communities	Other than the incremental deepening of deep subtidal habitat by dredging the high spot in the turning basin, no permanent change would result from dredging, temporary relocation of the Everingham Brothers Bait Company bait barges, or the temporary relocation of the Navy MMP. Minor and short-term impacts to vegetated and nonvegetated soft bottom benthic habitat would occur. The temporary relocation of the bait barges would not result in any impacts to habitats or communities because the relocation sites are in the same deep subtidal habitat as the existing location. Impacts to eelgrass from the proposed fuel pier would be minor (approximately 0.05 ac of eelgrass surveyed in 2011, and an additional 0.05 ac of habitat that historically supported eelgrass) and would be offset by using the Navy's established eelgrass mitigation bank. Eelgrass impacts from the temporary relocation of the Navy MMP would be minor (approximately 0.67 ac of eelgrass in 2011, and an additional 0.32 ac of habitat that historically supported eelgrass), temporary, and would be offset by using the established eelgrass mitigation bank. The structural habitat of the existing pier would be removed but largely replaced by that of the new pier; differences would be inconsequential. Organisms occurring in the immediate area may be lost or displaced directly by project activities (equipment or noise) or indirectly by short-term changes to suspended sediments, turbidity, dissolved oxygen, and light diffusion. Some invertebrates and fish within the dredge footprint would be lost to mortality due to entrainment during the dredging process. However, organisms are expected to return to the project area upon project completion, and epifauna are expected to recolonize the new fuel pier from nearby, undisturbed areas within a relatively short time period. Therefore, through the use of the preventative measures described below, the minor and short-term impacts to biological resource habitats and communities would not be significant. **Avoidance and Minimization Measures/Special Conservation Measures (SCMs):** Before proceeding with the project, the Navy would obtain the required Clean Water Act (CWA) Section 404/Rivers and Harbors Act (RHA) Section 10 permits. All required terms and condition of the permits would be implemented. The following avoidance and minimization measures are proposed	Impacts associated with Alternative 2 would be the same as those for the Alternative 1, with the exception that dredging activities would be delayed until years after completion of construction of the pier. Under Alternative 2, there would be no significant impacts to biological resource habitats and communities. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to utilize the NBPL fuel pier without replacement of the pier and without implementation of safety improvements. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	for use during the proposed activities to reduce the potential to impacts to habitats and communities. Fisheries, Birds, Marine Mammals, and Threatened and Endangered Species resource sections contain additional Avoidance and Minimization Measures applicable to those specific resources. • Sheet piling would be left in place to minimize sediment and eelgrass disturbance that would otherwise result from demolition activities. • In conjunction with a Caulerpa survey, a final pre-construction eelgrass survey would be conducted. Additionally, a post-construction eelgrass survey would be conducted and compared to both historical data and the pre-construction survey to determine the amount of eelgrass habitat permanently shaded, whichever is greater. This impact to eelgrass would be offset by using the Navy's established eelgrass mitigation bank. Temporary impacts at NMAWC would also be offset by the mitigation bank, but upon successful reestablishment of eelgrass within impacted areas at the NMAWC location, the bank would be credited for the reestablished acreage. • The contractor would use only clean construction materials suitable for use in the oceanic environment. The contractor would ensure no debris, soil, silt, sand, sawdust, rubbish, cement or concrete washings thereof, chemicals, oil, or petroleum products from construction would be allowed to enter into or placed where it may be washed by rainfall or runoff into waters of the U.S. Upon completion of the project authorized, any and all excess material or debris would be completely removed from the work area and disposed of in an appropriate upland site. • Spill kits and cleanup materials would be present during construction should there be a leak into the surrounding water. • All debris would be transported to, and disposed of, at an appropriate upland disposal site, or recycled if appropriate. • During project implementation, the Navy would regularly monitor construction activities to ensure that no deviation from the project as described herein is occurring. The Navy would report any violation of authorized impacts to the National Marine Fisheries Service (NMFS) within 24 hours of its occurrence. • The beach and adjacent strand/coastal scrub habitat inshore of the fuel pier and southward along the shore		

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	would not be used for any purpose.		
Fish	Fish communities and habitats would be temporarily affected by in-water construction and demolition. Temporary relocation of the bait barges would have no net effect because the barges would remain in the same habitat they currently occupy. The potential for injury to fish would exist at close ranges to impact pile driving. Within the corresponding Zones of Influence (ZOIs), fish are likely to move away from the pile being driven. Disturbance to fish is possible at greater ranges, but, if anything, only temporary behavioral reactions would be anticipated, without long-term consequences for fish populations. Impacts would not be significant. In conjunction with the NEPA process, the Navy consulted informally with National Oceanographic and Atmospheric Administration (NOAA)/ National Marine Fisheries Service (NMFS). An EFH analysis was conducted with an adverse effects finding. However, the Conservation Recommendation forwarded in the NOAA Fisheries response to the Navy EFH Analysis (refer to Appendix A) will be integrated into the Proposed Action. Approximately 0.05 ac of eelgrass habitat as of 2011, and an additional 0.05 ac of habitat that historically supported eelgrass, would be permanently shaded. This area represents a tiny fraction of that which is found within and adjacent to San Diego Bay (0.0027 percent and 0.0058 percent, respectively) and would be offset by using the Navy's established eelgrass mitigation bank. The proposed temporary relocation site for the Navy MMP would temporarily impact 0.67 ac of eelgrass surveyed in 2011, and an additional 0.32 ac of habitat that historically supported eelgrass; this temporary impact at NMAWC would be offset by using the established eelgrass mitigation bank. As such, implementation of Alternative 1 would not result in any significant impacts to fisheries or Essential Fish Habitat (EFH). **Avoidance and Minimization Measures/SCMs:** Avoidance and minimization measures integrated into the project design pertaining to Fisheries and EFH include the following: • Sheet piles beneath the existing pier would be left in place to minimize sediment and eelgrass disturbance. • In conjunction with a Caulerpa survey, a final pre-construction eelgrass survey would be conducted.	Impacts associated with Alternative 2 would be the same as those for Alternative 1, with the exception that dredging activities would not take place until years after completion of the new fuel pier. Under Alternative 2, there would be no significant impacts to fisheries. Under Alternative 2, the same NOAA Fisheries Conservation Recommendation will be integrated into the Proposed Action as for Alternative 1. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to utilize the NBPL fuel pier without replacement of the pier and without implementation of safety improvements. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	Additionally, a post-construction eelgrass survey would be conducted and compared to both historical data and the pre-construction survey to determine the amount of eelgrass habitat permanently shaded, whichever is greater. This impact to eelgrass would be offset by using the Navy's established eelgrass mitigation bank. Temporary impacts at NMAWC would also be offset by the mitigation bank, but upon successful reestablishment of eelgrass within impacted areas at the NMAWC location, the bank would be credited for the reestablished acreage. • The contractor would use only clean construction materials suitable for use in the oceanic environment. The contractor would ensure no debris, soil, silt, sand, sawdust, rubbish, cement or concrete washings thereof, chemicals, oil, or petroleum products from construction would be allowed to enter into or placed where it may be washed by rainfall or runoff into waters of the U.S. Upon completion of the project authorized, all excess material or debris would be completely removed from the work area and disposed at an appropriate upland site. • Spill kits and cleanup materials would be present during construction should there be a leak into the surrounding water. • During project implementation, the Navy would regularly monitor construction activities to ensure that no deviations from the project as described herein are occurring. The Navy would report any violation of authorized impacts to NMFS within 24 hours of its occurrence. The following avoidance and minimization measures would be followed during the proposed pile driving and dredging activities. • Soft Start - The use of a soft-start procedure is believed to provide additional protection to marine mammals by providing a warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. The Indicator Pile Program will utilize soft-start techniques (ramp-up/dry fire) recommended by NMFS for impact and vibratory pile driving. These measures are as follows: *"The soft-start requires contractors to initiate noise from vibratory hammers for 15 seconds at reduced energy followed by a 30-second waiting period. This procedure should be repeated two additional times. If an impact hammer is used, contractors*		

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	are required to provide an initial set of three strikes from the impact hammer at 40 percent energy, followed by a 30-second waiting period, then two subsequent 3-strike sets."		
Birds	Alternative 1 may disturb migratory bird breeding and resting in the immediate vicinity while construction and/or demolition activity is occurring. However, any impacts would be short-term, localized, and would not impact bird populations. Birds on the water regularly experience the noise and disturbance of passing vessels, while the project area is routinely subject to the elevated noise and activity of workers and equipment associated with common industrial practices. Hence, project-related noise is not expected to be a novel disturbance or to have strong effects on migratory birds. Indirect impacts to breeding because of reduced visibility or changes in prey distribution in response to noise or turbidity would similarly be localized, intermittent, and less than significant. No in-water demolition, construction, or dredging activities would occur during the least tern breeding season (1 April through 15 September). Temporary relocation of the bait barges would have no impact on bird populations because other structures provide suitable perch sites throughout the northern bay, and the barges would remain in the same habitat. Therefore, the Proposed Action would not have a significant impact under the Migratory Bird Treaty Act (MBTA) and there would be no significant impacts on other non-migratory marine bird habitat or populations. **Avoidance and Minimization Measures/SCMs:** Avoidance and minimization measures for birds would be the same as those for biological resource habitats and communities. Avoidance and minimization measures to protect California least terns are provided in the Threatened and Endangered Species resource section.	Impacts associated with Alternative 2 would be the same as those for Alternative 1, with the exception that dredging would not take place until years after completion of the new fuel pier. Under Alternative 2, there would be no significant impacts to birds. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to utilize the NBPL fuel pier without replacement of the pier and without implementation of safety improvements. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
Marine Mammals	The Proposed Action would not result in any injuries or mortalities (Level A takes) of marine mammals. Temporary relocation of the bait barges outside of the underwater noise zone of influence would greatly reduce the exposure of marine mammals to project-related underwater noise. The Proposed Action has the potential, however, to result in minor behavioral effects (Level B takes) to four marine mammal species from underwater noise associated with impulsive or vibratory pile driving, construction, and demolition. One of the four species (harbor seal) may also be subject to behavioral effects from airborne noise. Considering the 6.5-month work windows for all 3 years combined, total Level B behavioral harassments (takes) are expected as follows: California sea lions – 2,405; harbor seals – 270; gray whales – 45; and coastal bottlenose dolphins - 2,016. Marine mammals that are taken (harassed) may change their normal behavior patterns (e.g., swimming speed, breeding habits, etc.) or be temporarily displaced from the area of construction. Any takes would likely have only a minor effect on individuals and no effect on the population. As such, the Proposed Action would result in minor behavioral effects on individuals and localized, temporary effects on their habitat use but is not anticipated to have any detectable adverse impact on population recruitment, survival, or recovery (i.e., no more than a negligible adverse effect). Therefore, the implementation of Alternative 1 would not result in any significant impacts to marine mammals. **Avoidance and Minimization Measures/SCMs:** In conjunction with the NEPA process, the Navy prepared and provided an Incidental Harassment Authorization (IHA) Application and an associated Monitoring Plan to NMFS (for the anticipated marine mammal takes) for approval before commencing in-water demolition/construction activities. NMFS accepted the IHA Application and Monitoring Plan and issued an IHA (refer to Appendix A). . The Navy will abide by all conditions of the approved IHA. Section 3.4.3.2 details the avoidance and minimization measures set in place to lessen the impacts to mammals, which include avoidance and minimization measures for pile driving, a discussion of the avoidance and minimization measure effectiveness, monitoring, and reporting.	Impacts associated with Alternative 2 would be the same as those for Alternative 1, except that dredging would not take place until years after the completion of the new fuel pier. Under Alternative 2, there would be no significant impacts to marine mammals. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, the Navy will abide by all conditions of the approved IHA. Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to utilize the NBPL fuel pier without replacement of the pier and without implementation of safety improvements. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
Threatened and Endangered Species	California Least Tern Conservation measures established in the Memorandum of Understanding (MOU) Between U.S. Fish and Wildlife Service and the U.S. Navy Concerning Conservation of the Endangered California Least Tern in San Diego Bay, California (Appendix E.2) would be followed, resulting in the avoidance of noise- and turbidity-producing in-water activities in designated least tern breeding habitat, which includes the project area, from 1 April through 15 September, when least terns are present nesting and breeding in San Diego Bay. No effects would be associated with the temporary relocation of the bait barges, which would occur outside of the breeding season. No persistent effects on breeding conditions are expected once in-water construction/demolition activities are halted. At other times, the onshore noise and activity associated with the project would be similar to ongoing activities at NBPL and not expected to affect least tern breeding in the adjacent waters. There would be no effect on least tern nesting colonies, the nearest of which is across the bay at Naval Air Station (NAS) North Island. The Navy made a no effect determination on the California least tern. There would be no significant impact on the California least tern. Green Sea Turtle Potential impacts to green sea turtles would primarily be from noise generated during demolition, construction, or dredging activities. In-water activities would only overlap the tail end of the warm-water period when sea turtles are most likely to move through the project area; sea turtles are not expected to occur in northern San Diego Bay during the fall-winter timing of in-water construction/demolition and pile driving activities. Proposed monitoring would limit the potential exposure of sea turtles to underwater sound and in-water activities, and sea turtles would be able to detect and avoid these activities. Although it is unlikely that a sea turtle would move within a distance of potential Level B effect, sound generating activities would cease upon detection. Furthermore, no sea turtle habitat would be impacted by any project activities and all avoidance and minimization measures would be implemented to avoid potential impacts to green sea turtles from pile driving activities. No effects to sea turtle movements or habitat use are anticipated from the temporary relocation of the bait barges. The Navy consulted informally with NMFS (green sea turtle) and NMFS provided a letter	Impacts associated with Alternative 2 would be the same as those for Alternative 1, with the exception that dredging would not take place until years after completion of construction of the pier. Under Alternative 2, there would be no significant impacts to threatened and endangered species. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to utilize the NBPL fuel pier without replacement of the pier and without implementation of safety improvements. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	(refer to Appendix A) concurring with the Navy's determination that the Proposed Action may affect, but is not likely to adversely affect green sea turtles. Therefore, the Navy has concluded that Alternative 1 may affect, but is not likely to adversely affect, the green sea turtle. There would be no significant impact on the green sea turtle. Programmatically, the Navy will continue to consult informally with NMFS on other Navy construction activities and facilities projects throughout San Diego Bay to identify any risks that could negatively impact sea turtles and to agree upon related avoidance and minimization measures. These measures would support a programmatic "may affect, not likely to adversely affect" finding that would be subject to the regulator's written concurrence. Western Snowy Plover Since the western snowy plover is not known or expected to occur in the project area, there would be no effect on individuals or potential habitat for this species. The Navy made a no effect determination on the western snowy plover. Therefore, there would be no significant impact to western snowy plovers. Other Special Status Species The project sites are not in proximity to important breeding, resting, or breeding areas for bird species, and similar habitats are abundant throughout San Diego Bay. No impacts are anticipated from the temporary relocation of the bait barges as they would be located within the same deep subtidal habitat. Potential disturbance of shoreline and adjacent open water areas that may be used on a transient basis by sensitive water and shore bird species would be short-term and less than significant. Noise generated during demolition, construction, and dredging activities would not substantially increase noise levels. Additionally, these increases in noise and activity would not vary substantially from normal levels of activity, vehicular traffic, and marine vessels operating in the immediate area and would cease upon completion of demolition, construction, and dredging activities. Therefore, with implementation of Alternative 1 there would be no adverse effect on these species' populations or habitats. **Avoidance and Minimization Measures/SCMs:** The following avoidance and minimization measures would be utilized during the proposed activities to reduce the potential to impact threatened and endangered species:		

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	• Dredging and other in-water demolition or construction would not occur during the endangered California least tern breeding season (1 April – 15 September). • The Navy would continue to follow the conservation measures established in the current Tern MOU (Appendix E.2). • In conjunction with marine mammal monitoring (Section 3.4.3.2 of this EA) (currently part of the Navy's IHA application), qualified observers will also search for and document any occurrence of sea turtles within areas of potential effect or interaction with the project. During pile driving/extraction activities, monitoring will extend to the limit of potential Level B behavioral harassment, specifically to the underwater 160 decibels (dB) re 1 microPascal (µPa) (root mean square [rms]) isopleth for impact pile driving; and for vibratory pile driving or extraction, to either the underwater 120 dB re 1 µPa (rms) isopleth or to the point at which project sound becomes indistinguishable from background noise (maximum project sound pressure level [SPL] [rms] ≤ median ambient rms), whichever is less. A 10-meter (m) buffer zone will also be monitored during other in-water operations of equipment and vessels. Monitoring will commence at least 15 minutes prior to the activities. • If any sea turtle is seen within these visual ranges prior or during the corresponding activity, the activity would not commence until the animal has moved out of the area or at least 15 minutes has passed since the last such sighting. • Programmatically, the Navy will continue to consult informally with NMFS on sea turtle occurrence and Navy construction activities and facilities projects throughout San Diego Bay to identify any risks that could negatively impact sea turtles.		
Water Resources	There would be no impact to bathymetry from temporary relocation of the Navy MMP, the Everingham Brothers Bait Company bait barges, and pier demolition and construction. The impact to bathymetry from dredging the high spot in the existing turning basin would be less than significant because most of the area, surrounding the proposed dredge footprint is already deeper than the proposed dredge depth (-40 ft mean lower low water level). Use of dredge sediments for nearshore replenishment at SSTC beach would be a beneficial impact. There would be minor, short-term localized increases to	Under Alternative 2, dredging would be done years after the pier replacement effort is completed. Thus under this Alternative, there would be no potential intermittent overlap of increased	Under the No-Action Alternative, no in-water demolition, construction dredging, and sediment beneficial reuse activities would occur and existing water resources would not

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	circulation in San Diego Bay in the project areas caused by vessel movement, in-water demolition, construction, and dredging; these increases would cease when each particular activity ends. The in-water structures to be installed (the new fuel pier and the temporary Navy MMP facilities) would not form barriers to the natural movement of water in San Diego Bay. Temporary relocation of the Everingham Brothers Bait Company bait barges would not involve in-water construction, dredging, or other activity that would affect movement of water in San Diego Bay. Increased turbidity because of sediment resuspension during demolition and construction would be short-term and limited to the demolition/construction areas around the fuel pier. Increased turbidity while dredging with either a hopper or clamshell dredge would be short-term as well, because the dredge material is larger-grained material (sand) that tends to settle quickly. The Navy MMP is covered under NBPL's overall National Pollutant Discharge Elimination System (NPDES) permit, which would be amended for the temporary relocation of the Navy MMP to NMAWC. Based on analytical testing, the physical and chemical composition of the sediment from the fuel pier and proposed NMAWC project footprint disturbance areas indicates larger grain size (sand) and low concentrations of contaminants. These results indicate contaminant resuspension during project activities would have minimal effect on fish and EFH. Therefore, impacts to water quality as a result of turbidity from sediment resuspension would not be significant. It is not anticipated that bacteria loading from Navy marine mammals alone would exceed San Diego Basin Plan waters designated for contact recreation beneficial uses (REC-1) water quality limits at the proposed 100 ft-security barrier that would be established around the temporary MMP facilities; therefore, significant impacts to water quality would not occur. However, the Navy would monitor water quality while the MMP occupies the temporary relocation site at NMAWC. If the monitoring results indicate that water quality is impacted by this action more than currently anticipated, the Navy would employ adaptive management measures in consultation with California Coastal Commission (CCC) staff (described below under Avoidance and Minimization Measures/SCMs). The new fuel pier would have stormwater management	turbidity associated with demolition and construction activities. With the exception of when dredging would occur, Alternative 2 is the same as Alternative 1, Alternative 1. Under Alternative 2 there would be a beneficial impact to bathymetry due to use of dredged sediments for nearshore replenishment at SSTC beach; There would be no significant impacts to circulation and water quality. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	be affected. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	capabilities that would comply with current NBPL permit requirements. All rainfall accumulating on the lower deck as well as rainfall from the 85th percentile storm event accumulating on the upper deck of the new pier would be captured and pumped to NBPL's fuel oil reclamation facility for treatment. Basewide and site-specific Best Management Practices (BMPs) to prevent impacts to surface water would be followed at the new fuel pier. Therefore, with implementation of Alternative 1, no significant impacts to water quality would occur. During demolition, construction, dredging, and sediment beneficial reuse, protective measures would be implemented to minimize impacts to marine water quality. Protective measures for demolition and construction would include the use of catch devices and sheeting to prevent the release of debris and hazardous materials/waste into San Diego Bay, and the NBPL Emergency Response Action Plan to minimize the effect of any spills that might occur. As a protective measure to prevent turbidity, the sheet pile beneath the existing fuel pier would be retained. All in-water work would comply with the requirements of a Section 401 Water Quality Certification from the San Diego Regional Water Quality Control Board (RWQCB) and Section 404/Section 10 permits from the USACE. For the reasons listed in the preceding paragraphs, with implementation of Alternative 1 there would be no significant impacts to bathymetry, circulation, and water quality within San Diego Bay. **Avoidance and Minimization Measures/SCMs:** The following avoidance and minimization measures/SCMs would be implemented as part of Alternative 1 to reduce impacts to below a level of significance: • Sheet piles beneath the existing fuel pier would be left in place to minimize sediment and eelgrass disturbance. • The demolition and construction contractors would be required to prepare and implement a Construction Demolition Plan that would cover all phases of the work to be done. The contractors' plan would be required to specify materials, equipment, and procedures to be used to contain all construction and demolition waste and debris. • Contractors would be required to use catch devices and sheeting to capture and contain debris.		

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	• Before demolition begins, the contents of each pipeline would be pumped out. The pipelines would be cleaned to minimize accidental release of pipeline residue during demolition activities. Pipeline contents and cleaning water would be captured and properly disposed. • Per the NBPL Emergency Response Action Plan, any petroleum release or petroleum sheen observed on the water surface would be reported to the National Response Center and other agencies as required. • Booms and other spill containment equipment kept on hand would be immediately deployed, the source of the release would be determined and secured, and cleanup measures appropriate to the nature and extent of the spill would be implemented. These procedures would minimize the potential for contaminants related to project activities to enter marine waters. • Potential adaptive management measures to reduce bacteria concentrations in the waters surrounding the proposed NMAWC temporary relocation site for the Navy MMP could include: housing 27 of the Navy MMP 30 sea lions in the southernmost enclosures, where bay circulation is greater; removing solid sea lion scat from walkways and enclosures before pressure washing; transferring some of the animals back to the existing Navy MMP location (near the fuel pier) during non-pile driving activities; and installing ultraviolet treatment systems or aeration equipment to enhance bacterial degradation. • Upon completion of the new fuel pier, the NBPL Storm Water Discharge Management Plan and the fuel pier BMPs would be reviewed, and revised/updated as needed to incorporate changes resulting from the changes to the fuel pier structure and/or operations. The NBPL Storm Water Discharge Management Plan and Basewide BMPs for preventing and minimizing contact of potential pollutants with stormwater would continue to be followed, including: restricting access, regular cleaning and sweeping, controlling spills and reducing waste, avoiding hosing down the site, and regular inspection and maintenance of the storm drain system. All BMPs specific to the fuel pier would also be followed. • A Section 401 Water Quality Certification from the RWQCB would be obtained, as would a Section 404/Section 10 permit from the USACE; these permits would apply to all		

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	in-water components of the project.		
Hazardous Materials and Wastes	Through the use of the preventive measures described below and implementation of the procedures described in the Emergency Response Action Plan in the event of an accidental release, no increase in human health risk or environmental exposure to hazardous materials or hazardous wastes would occur with implementation of Alternative 1. Therefore, implementation of Alternative 1 would not have a significant impact with respect to the use, storage, or disposal of hazardous materials or hazardous wastes. Through adherence to Navy Region Southwest (NRSW) recycling and waste minimization requirements and reuse of the construction materials required for the Navy marine mammal temporary relocation component, implementation of Alternative 1 would not have a significant impact to solid waste and regional landfill capacity. **Avoidance and Minimization Measures/SCMs** • The Navy would characterize all hazardous wastes associated with demolition of the existing fuel pier (building materials falling under the Universal Waste Rule, coal tar coating on the steel superstructure, lead-based paint (LBP), asbestos-containing materials (ACMs) (if determined to be present), and treated wood waste for proper disposal at an appropriately-permitted facility. • Construction contractors would be required to prepare and implement a comprehensive debris management plan to address types of debris expected, separation, and retrieval methods. • Catch devices and sheeting would be used to capture and contain debris, and floating booms would be placed around the work site to confine any potential release to a minimal area. • Contractors involved with construction and demolition for all components of Alternative 1 would be subject to all federal, state, and San Diego County requirements for hazardous materials and hazardous waste management, and would be required to follow the requirements of the NRSW Waste Management Plan (NRSW 2007). In addition, demolition and construction contractors would implement BMPs designed to minimize the potential for hazardous	Under Alternative 2, the same project components would occur as for Alternative 1, involving the same types and volumes of hazardous and non-hazardous materials and wastes. Therefore, no significant impacts associated with hazardous materials, hazardous wastes, public health and safety, and solid waste would occur. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	Under the No-Action Alternative, fueling operations currently being conducted at the existing fuel pier would continue. Therefore, there would be no change from the existing conditions. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	material releases during demolition and construction activities. • Emergency procedures in Section 5 of the NRSW Waste Management Plan would be followed upon discovery of any spill or release either in or outside the work area. • A safety buffer zone would be established between the underwater fuel pipelines to NAS North Island and the demolition/construction work zone and dredge footprint. All contractors' equipment and vessels would remain outside the safety buffer zone. • Before the fuel pier is demolished, all fuel, lubricating oil, and contaminated petroleum product inside the pipelines on the fuel pier would be pumped out and the pipelines would be cleaned. • In the event of an accidental spill or release of oil or hazardous substance, the procedures in the NBPL Emergency Response Action Plan would be followed to contain the release and minimize impacts. • The proposed project would be required to prepare and follow a Navy-approved Explosives Safety Submission Determination Request (ESS DR) that details how Navy explosives safety standards would be evaluated and employed to ensure protection of personnel and Navy assets in the event of unintentional detonation during project activities. The water depths in the project areas where pile driving and dredging would take place would absorb the shock waves and fragmentation of an accidental detonation. The dredged sediments would be screened to remove potential discarded military munitions (DMM), and NRSW Explosive Ordnance Disposal (EOD) Mobile Unit 3 Detachment would respond if needed. With the protective effect of the pile-driving site, water depths, and use of the above-referenced safety plans and procedures there would be no significant impact from DMM. • The USCG and CSLC would continue to inspect fuel pier operations while the existing fuel pier remains in use during the first phase of construction, and would inspect the new pipelines and fuel pier operations when the new pier is completed. The pipelines on the new fuel pier would be constructed according to applicable federal and state regulations for pipelines and marine bulk fuel transfer facilities. • The oily water pipeline for the new fuel pier would be		

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	designed and tested in accordance with the requirements of California Code of Regulations (CCR) Title 22, Chapter 15-Interim Status Standards for Owners and Operators of Hazardous Waste Transfer, Treatment, Storage, and Disposal Facilities, Article 10 Tank Systems and the applicable guideline standards in the American Petroleum Institute Standard 650 Welded Tanks for Oil Storage. • Hazardous wastes that would be generated at the new fuel pier would continue to be managed according to federal, state, and county regulations, and be recycled/disposed of appropriately by licensed contractors. The San Diego County Department of Environmental Health would continue their regulatory oversight of hazardous waste activities at the new fuel pier.		
Airborne Noise	Pile driving would be the dominant noise-generating activity associated with the proposed project. All pile driving would take place during daylight hours (nominally 7:00 A.M. to 4:00 P.M. on weekdays). During pile driving, outdoor airborne noise levels in residential areas beyond the NMAWC boundary and in the La Playa neighborhood north of NBPL would not exceed City of San Diego construction noise ordinances (75 decibels A-weighted [dBA]). During pile driving at NMAWC, the indoor noise levels at schools and day care centers beyond the NMAWC boundary would be slightly greater than the classroom criteria levels for effective hearing with windows closed (35 dBA). Since the pile driving would be intermittent during the school day these levels would be considered acceptable and therefore, would not result in a significant noise impact. During pile driving at NBPL, the indoor noise levels with windows closed at the Child Development Center (CDC) at Building 377 at NBPL would be slightly greater than the classroom criteria levels for effective hearing (35 dBA). Since the pile driving would be intermittent during the school day, and there would be 5.5 months without pile driving (during the least tern breeding season), these noise levels would be considered acceptable and therefore, would not result in a significant noise impact. **Avoidance and Minimization Measures/SCMs:** The following avoidance and minimization measures/SCMs would be implemented as part of Alternative 1 to reduce noise impacts to below a level of significance:	Under Alternative 2, the noise impacts associated with the demolition, construction, and dredging activities would be the same as those discussed under Alternative. 1. However, dredging would take place years after construction was completed, so noise from dredging would occur in the absence of other project-related noise. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and	Under the No-Action Alternative, industrial activities currently being conducted in the area would continue, and the area's acoustical environment would remain unchanged. Therefore, there would be no noise impacts associated with the No-Action Alternative. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative,

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	• Construction activities, including pile driving, would only occur during daylight hours (nominally 7:00 A.M. to 4:00 P.M., Monday through Friday). • The educational facilities listed in Tables 3.8-1 and 3.8-2 of this EA would be informed of the dates of pile driving and advised to close classroom windows during the pile driving intervals. The following additional avoidance and minimization measures/SCMs could be implemented as part of Alternative 1 to further attenuate noise levels if a greater reduction is desired. • Noise monitoring for classroom criteria. • Acoustic blankets around the pile driver. • Pile cushions could be used to reduce noise levels.	minimization measures/SCMs would be the same as those for Alternative 1.	avoidance and minimization measures/SCMs would not be necessary.
Air Quality	Operational emissions would primarily be from mobile sources associated with the use of the pier, including Navy marine vessels and ground vehicles that would service the pier. Because the purpose of the Proposed Action is to replace the aging, seismically deficient, and obsolete pier with a new pier that would improve safety and fuel receipt and delivery capabilities, Alternative 1 is designed to serve existing needs and would not result in increases in mobile source emissions. Therefore, the air quality analysis focuses on construction activities required to replace the pier. Estimated annual construction emissions with implementation of Alternative 1 would be below the *de minimis* threshold levels for Clean Air Act (CAA) conformity. In addition, Alternative 1 would conform to the San Diego Air Basin Shore State Implementation Plan (SIP) and would not trigger a conformity determination under Section 176(c) of the CAA. The Navy has prepared a Record of Non-Applicability (RONA) for CAA conformity (Appendix G of this EA). No health effects would be anticipated from emission of hazardous air pollutants (HAPs) because the majority of project activities occur in restricted areas where there are no sensitive receptors (i.e., residents, schools, hospitals, etc.). Therefore, with implementation of Alternative 1, significant impacts to air quality would not occur. **Avoidance and Minimization Measures/SCMs:** The following avoidance and minimization measure/SCM would be implemented as part of Alternative 1 to ensure that	Impacts associated with Alternative 2 would be the same as those for Alternative 1 with the exception that dredging would take place years after completion of the new fuel pier. Under Alternative 2, there would be no significant impacts to air quality. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, the avoidance and minimization measure /SCM would be the same as for Alternative 1.	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to operate the NBPL fuel pier without replacement of and without implementation of safety improvements. There may be additional air quality impacts should vessels be required to wait until the pier is available and conduct additional maneuvering for safety purposes. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	impacts are reduced to below a level of significance: • All necessary construction or operationally-related permits would be authorized by the San Diego County Air Pollution Control District (SDCAPCD) before project implementation occurs.		would not be necessary.
Transportation and Circulation	Proposed demolition and construction associated with replacement of the NBPL fuel pier would cause temporary and less than significant changes to traffic and circulation in the region of influence (ROI) during the demolition/construction period. Temporary changes to traffic and circulation associated with temporary relocation of the Navy MMP to NMAWC would also be less than significant. Operations at the new fuel pier would not result in additional vehicle traffic to the pier because the number of workers and work vehicles would not change. Implementation of Alternative 1 would not result in any change to baseline Level of Service (LOS) on any roadway segment or intersection in the region of influence. Moreover, Alternative 1 would not cause a substantial traffic impact based on City of San Diego criteria. Therefore, impacts to transportation and circulation would not be significant. **Avoidance and Minimization Measures/SCMs:** The following potential avoidance and minimization measure/SCM could be implemented as part of Alternative 1 to facilitate site access if it is desired to further reduce the volume of project traffic on Rosecrans Street during project construction. • If needed, trucks going to and from the fuel pier construction area could be staged or queued at the Navy's truck inspection site on Cabrillo Memorial Drive. Staged/queued trucks would enter and leave NBPL and the fuel pier construction site via the McClelland Gate. In order to avoid potential cumulative impacts relative to marine traffic, the following minimization measure is recommended: • To ensure safety of all vessels using San Diego Bay, the Navy would coordinate with the USCG to issue a Notice to Mariners when in-water components of this project are occurring, including temporary relocation of the Navy marine mammals and the Everingham Brothers Bait	Impacts associated with Alternative 2 would be the same as those for Alternative 1, with the exception that dredging activities would be delayed until completion of construction of the pier. Under Alternative 2, there would be no significant impacts to Transportation and Circulation. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, the potential avoidance and minimization measure/SCM would be the same as for Alternative 1.	Under the No-Action Alternative, roadway and vessel traffic conditions would remain unchanged. Therefore, no significant impacts to transportation and circulation would occur. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table ES-1. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	Company bait barges, dredging and sediment disposal.		
Socioeconomics, Environmental Justice, and Growth Inducement	There would be an overall beneficial impact to the economy of San Diego County from the fuel pier replacement and dredging project. Economic benefits associated with construction activities would more than offset potential reductions in economic activity in industries related to recreational fishing, leading to a net beneficial economic impact to San Diego County during the life of the project. No low-income or minority populations would be disproportionately or adversely affected, so no environmental justice impacts would occur. There would be no housing development or need for an in-migrating construction workforce, nor would any constraints to growth be removed, so there would be no impacts associated with induced growth.	Impacts associated with Alternative 2 would be the same as those for the Alternative 1, with the exception that dredging activities would be delayed until years after completion of construction of the replacement fuel pier. Under Alternative 2, there would be no significant impacts to socioeconomics or environmental justice and no impacts associated with induced growth.	Under the No-Action Alternative, socioeconomic conditions would remain unchanged. Therefore, no significant impacts to socioeconomics or environmental justice would occur.

NAVAL BASE POINT LOMA (NBPL) FUEL PIER REPLACEMENT AND DREDGING (P-151) ENVIRONMENTAL ASSESSMENT

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CHAPTER 1
PURPOSE AND NEED FOR THE PROJECT

1.1 INTRODUCTION/BACKGROUND

This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] § 4321, as amended); the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (Title 40 Code of Federal Regulations [CFR] §§ 1500-1508, 1 July 1986); and Navy Procedures for Implementing NEPA (32 CFR § 775).

The existing fuel pier is located on San Diego Bay at Naval Base Point Loma (NBPL) (Figures 1-1 and 1-2). It currently serves as a fuel depot for loading and unloading tankers and United States (U.S.) Navy underway replenishment vessels that refuel ships at sea ("oilers") fueling Navy, Department of Homeland Security (DHS), Department of Defense (DoD), and foreign navy vessels, as well as transferring fuel to the local replenishment vessels and other small craft operating in San Diego Bay. The fuel pier at Fleet Logistics Center (FLC) Fuel Facility NBPL is critical to the mission of the Navy and is the largest active Navy fueling facility in the southwest region. More than 42 million gallons of fuel are stored at FLC Fuel Facility NBPL and more than 11 million gallons of fuel are issued and received every month to an average of 43 ships including the Military Sealift Command, Expeditionary Warfare Training Groups, three carrier strike groups, National Oceanic and Atmospheric Administration (NOAA), DHS, foreign, and small craft.

The approach (portion that connects to shore) and north segments are over 100 years old, constructed in 1908 as the La Playa Coaling Wharf. The south segment was constructed in 1942. The average design service life of this kind of structure in a marine environment is typically considered to be about 50 years (Navy 2010a). The pier, as such, is significantly past its designed service life. Further, the pier does not meet current California State Lands Commission (CSLC) - Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) Level 1 (operational) and Level 2 (spill prevention) seismic criteria (Navy 2010a, 2010b). According to the Structural Evaluation and Seismic Analysis (Navy 2010b) conducted for this project, the existing fuel pier is not structurally sufficient to comply with the following Level 2 Seismic Performance Requirements:

- Controlled inelastic structural behavior with repairable damage.
- Prevention of structural collapse.

Because of the structural deficiencies, significant damage in a moderate earthquake is considered to be likely, with potential catastrophic failure of the pile foundations occurring in a major seismic event (Navy 2010a).

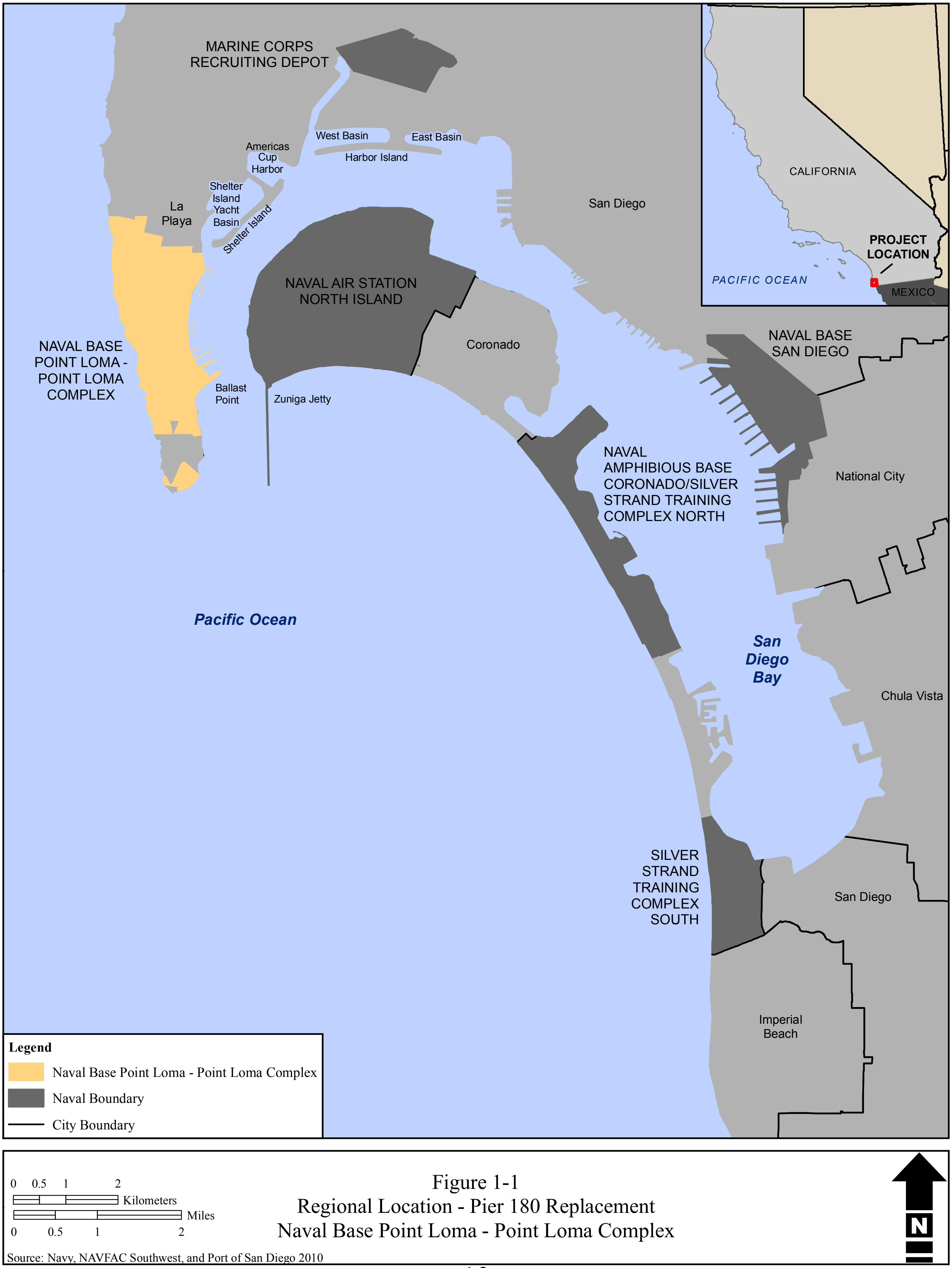


Figure 1-1
Regional Location - Pier 180 Replacement
Naval Base Point Loma - Point Loma Complex

Source: Navy, NAVFAC Southwest, and Port of San Diego 2010

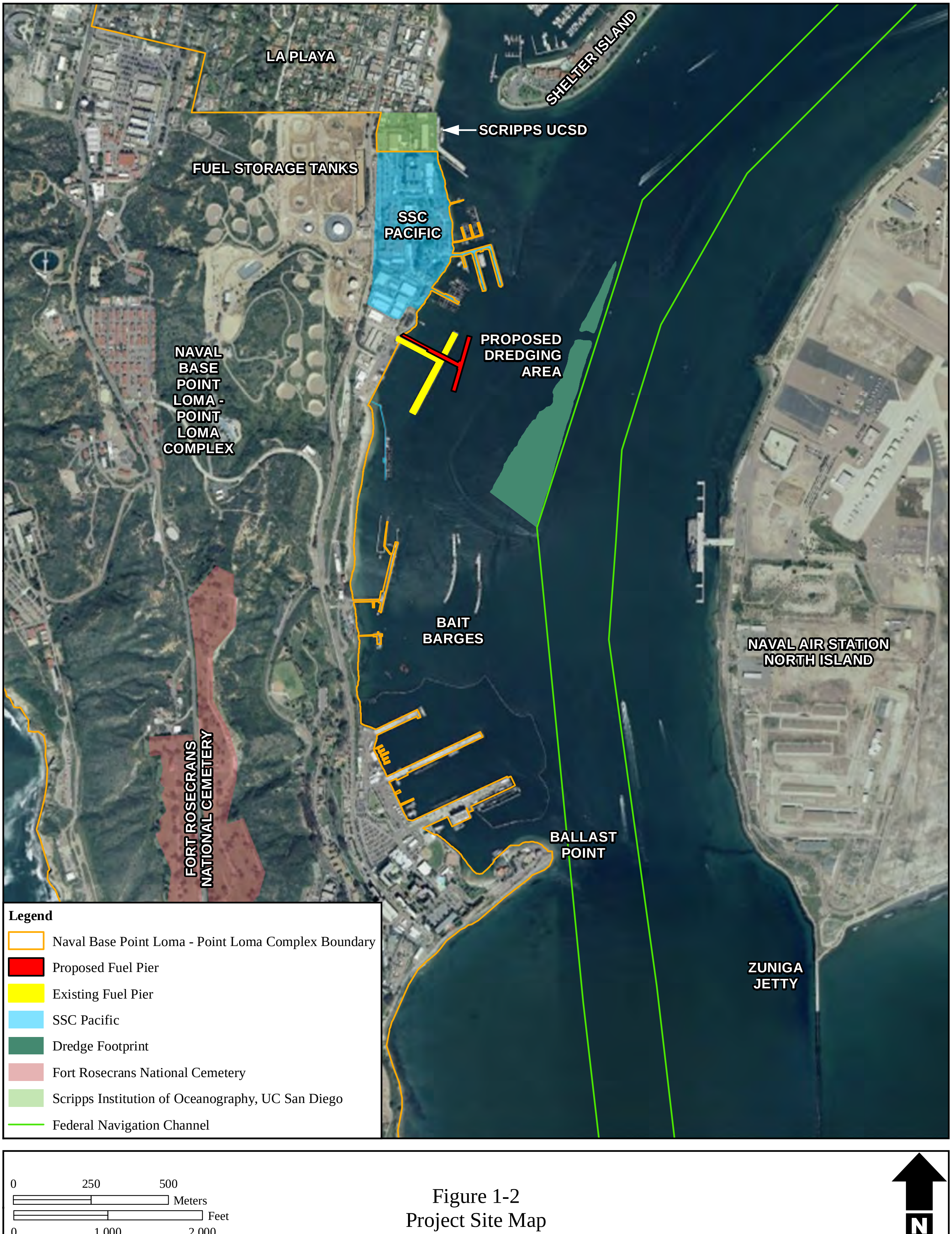


Figure 1-2
Project Site Map

Sources: Navy 2007; NOAA 2012; NAVFAC Southwest 2011a

The State of California enforces special requirements for marine oil terminals, particularly with regard to seismic criteria. The Navy has agreed to comply with the California MOTEMS requirements for the fuel pier. However, the existing fuel pier is not consistent with the MOTEMS seismic criteria. The poor condition of the existing fuel pier has also been noted in the Navy Region Southwest (NRSW), Port Operations Shore Infrastructure Plan, dated April 2009 (Navy 2010a). Per the Defense Readiness Reporting System, an overall rating of "F4" has been assigned to the existing fuel pier facility. The F4 rating translates into "Facility has deficiencies that prohibit or severely restrict use of its designated functions." The Port Operations Shore Infrastructure Plan has listed P-151 "Replace Pier 180" as a planned project affecting port operations for NRSW. Additionally, the existing fuel pier is situated in waters where the natural bottom depth is between 30 to 40 feet (ft) thus requiring maintenance dredging because San Diego Bay has an open hydrologic circulation system that causes infill around piers and infrastructure. Dredging occurred most recently in 1999 to keep the pier accessible for larger vessels.

To support the fueling needs of the Navy and DHS, the FLC Fuel Facility NBPL must be able to provide adequate services, i.e., receive and issue fuel, to multiple ships at a time. To meet this requirement, ships and barges are received on both the inboard and outboard sides of the existing pier. The inboard south side of the pier is primarily used for fuel issues to small cutters, mine sweepers, and barges. The inboard north side is used for fueling small craft. The outboard side of the pier is currently used to issue and receive fuel from large ships, i.e., tankers, oilers, transport ships, dock landing ships, ocean going barges, and various other Navy and DHS vessels. When included with scheduling requirements, the demand of the existing pier has exceeded the facility capacity. In addition, the existing fuel pier has reached a maximum capacity for the deeper outer berth, resulting in the need to turn vessels away due to lack of available docking and mooring space.

It is anticipated that future classes of ships would generally be more multi-purpose, require more frequent fueling, and further increase the fuel capacity loading requirement for the new replacement fuel pier (Navy 2010a). The existing fuel pier lacks deep water berthing capability and is therefore limited in the range of vessels that can be accommodated (Navy 2010a).

The Proposed Action would generally allow the future year fueling of newer and larger ships. However, no specific new ship fueling, homeporting, or operational actions with any relationship to the Proposed Action are currently planned or foreseen. As any future proposals for ship fueling, homeporting, and operations are developed over the next decade, they will be appropriately addressed in NEPA documentation at that time. There is no element of the Proposed Action that would add vessel traffic (public or federal).

1.2 PROJECT LOCATION

The project site is located at the FLC Fuel Facility NBPL in the Point Loma Complex, San Diego, California. NBPL-Point Loma Complex is located on the west side of San Diego Bay, near the mouth of the bay directly opposite Naval Air Station (NAS) North Island as shown in Figure 1-1. NBPL-Point Loma Complex includes Space and Naval Warfare Systems Center (SSC) Pacific. The Point Loma Complex is bordered to the north by Scripps Institution of

Oceanography (SIO) University of California San Diego (UCSD); the communities of La Playa and Sunset Cliffs, to the east by the San Diego Bay; to the west by the Pacific Ocean; and to the south by Cabrillo National Monument and the Pacific Ocean. Fort Rosecrans Military Cemetery runs down the middle of the peninsula (see Figure 1-2). The shoreside of Pier 180 connects with NBPL roadways (Figure 1-3a). Figure 1-3b presents a view of the existing Fuel Pier 180 looking toward the northeast. All of the land within the NBPL boundaries is restricted from general public access. The adjacent waters of San Diego Bay are heavily used by the public and the Navy.

SIO repaired a portion of its pier on the land adjacent to the north of NBPL in December 2012, and plans to replace its pier and other waterfront infrastructure concurrent with the Navy's fuel pier replacement project. The two Scripps projects are discussed in Sections 4.1.1.8 and 4.1.3.1 of this EA, respectively.

1.3 PURPOSE OF AND NEED FOR THE PROJECT

The Project is needed to provide improved safety features and improved fuel receipt and delivery capability at FLC Fuel Facility NBPL Pier 180 to service existing and future classes of naval vessels. As described in Section 1.1, *Introduction/Background*, there is a need for this project because: (1) portions of the existing fuel pier are over 100 years old and past designed service life; (2) the existing fuel pier does not meet MOTEMS seismic criteria for marine oil terminals; (3) the existing fuel pier lacks adequate deep water berthing capability, thus cannot safely accommodate all of the existing and future classes of vessels; (4) portions of the existing turning basin are too shallow to safely accommodate current and future deep draft berthing capabilities; (5) improved fueling features and capabilities are needed to service the current and projected future demand of vessels, which is currently expected to increase by about 30 to 35 percent by 2018; and (6) Navy and DHS need adequate and safe ship fueling facilities now and in the future to accomplish their mission of national defense.

Bringing this aging structure up to compliance levels with repairs or modifications to meet these needs is not economically feasible given the existing structural system and the condition of the structure. New pier construction would provide a safe, secure, and environmentally compliant facility with a service life that can be expected to exceed 50 years.

The purpose of the project is to replace the aging, seismically deficient, and increasingly dysfunctional and obsolete fuel pier (Pier 180) at NBPL with a new pier that would meet current CSLC MOTEMS, and meet projected ship fueling requirements and enable the Navy and DHS to meet their national security and defense missions.

a) Aerial View of Existing Fuel Pier 180

b) View of Existing Fuel Pier 180 to the northeast

Figure 1-3
Views of Existing Fuel Pier 180

1.4 DECISION TO BE MADE

The decision to be made as a result of the analysis in this EA is first to decide if an Environmental Impact Statement (EIS) needs to be prepared. An EIS would need to be prepared if it is anticipated that the Proposed Action would have significant impacts on the human or natural environment. Should an EIS not be deemed necessary, then a Finding of No Significant Impact (FONSI) would be prepared. If a FONSI is prepared and executed, then the Navy may decide to move ahead with the Proposed Action or one of the analyzed alternatives in the EA without further procedures pursuant to NEPA.

1.5 SCOPE OF THE ANALYSIS

NEPA, CEQ regulations, and Navy procedures for implementing NEPA specify that an EA should address only those resource areas potentially subject to impacts. In addition, the level of analysis should be commensurate with the anticipated level of environmental impact. Relevant pre-planning studies that determined the scope of analysis include:

- Sampling and Analysis Report for NBPL Fuel Pier Replacement and Dredging (Naval Facilities Engineering Command [NAVFAC] Southwest 2011b).
- United States Environmental Protection Agency (USEPA) determination of NBPL Fuel Pier Replacement and Dredging suitability of dredge sediments for aquatic disposal (USEPA 2011).
- Sediment Grain Size Distribution and Mean Grain Size - Offshore Disposal Sites compared to Pier 180 Dredging Site (Tierra Data, Inc. [TDI] 2012a).
- Acoustic Transmission Loss Model for North San Diego Bay (Dahl and Farrell, Applied Physics Laboratory and Department of Mechanical Engineering, University of Washington, Seattle. January 2011. Unpublished data presented as Appendix E-4 of this EA).
- Marine Mammal Surveys in the Vicinity of the Point Loma Naval Complex, San Diego, California. Final Report. Prepared for NAVFAC Southwest (Merkel & Associates, Inc. 2008).
- Marine Mammal Surveys. February-April 2012. Unpublished data. Prepared under contract to NAVFAC Southwest (TDI 2012b).
- Marine Mammal Surveys of North San Diego Bay - Unpublished data and reports prepared by C. Johnson. (U.S. Pacific Fleet June 2009, October 2009, February 2010, April 2010, November 2010, March 2012).

Resources carried forward for detailed analysis in this EA include: biological resource habitats and communities, fisheries, birds, marine mammals, threatened and endangered species, water resources, hazardous materials and wastes, noise, air quality, transportation and circulation, and socioeconomics and environmental justice. Several resource areas have not been carried forward for detailed analysis in this EA since potential impacts were considered non-existent or negligible. The resources not carried forward for analysis, and the rationale for not carrying these resources forward are discussed below.

Geological Resources – Minimal surficial modifications associated with the proposed project would not result in impacts to geology and topography, and the proposed new fuel pier and associated infrastructure would be designed and constructed in accordance with Unified Facilities Criteria (UFC) and MOTEMS seismic standards.

Cultural Resources – No known archaeological or cultural resources sites at NBPL or NMAWC would be affected by the proposed project, and the Navy would implement archaeological monitoring during excavation activities within a portion of the project area at NBPL that is identified to have buried archaeological potential.

Land Use – Land use at NBPL and NMAWC would not change, and the temporary changes to uses of the waters offshore from NMAWC and Harbor Island during the relocation of the Navy Marine Mammal Program (MMP) and the bait barges, respectively, would not affect recreational or commercial navigation in San Diego Bay. Permanent amendments to the U.S. Coast Guard (USCG) Security Zone to provide an adequate security zone for the proposed new pier alignment would not affect recreational or commercial navigation because there would still be 700 ft of open water between the new Security Zone Boundary and the federal navigation channel. The Navy consulted with the California Coastal Commission (CCC) on all project components. The CCC found the proposed project-to-be consisted, to the maximum extent practicable, with the California Coastal Management Program (see Appendix A).

Recreation and Recreational Navigation – Pier demolition and construction, and dredging would not have significant impacts to recreation and recreational boaters because these project activities would not occur in highly used recreational areas and waters. The Everingham Brothers Bait Company barges would not anchor at the temporary location during the busiest recreational sailing period (summer), and most bait barge operations take place overnight when recreational boaters are not active.

Aesthetics – The proposed new fuel pier would be consistent with its surroundings in a military industrial waterfront. The proposed temporary relocation of the Navy MMP and the Everingham Brothers Bait Company facilities would be visually consistent with the temporary relocation sites. Under the Marine Mammal Protection Act (MMPA) Section 101(a) (4), private property owners may deter marine mammals from hauling out onto docks and/or vessels and potentially damaging private property.

Public Services and Utilities – No new public services would be constructed and the utility infrastructure and fuel system for the proposed new fuel pier would be accommodated without significantly affecting the NBPL system/network capacity.

Public Health and Safety – The storage and handling of bulk fuels, water quality, and construction safety are all extensively regulated to minimize risk. Public Health and Safety with respect to hazardous materials, hazardous wastes and explosives safety is analyzed in Section 3.7. The proposed potential bait barge relocation sites under consideration southeast of Harbor Island were selected because they avoid bird-aircraft strike hazards for Navy, USCG, and Lindbergh Field (San Diego International Airport) aircraft (NRSW 2012, USCG 2012). Under the Marine Mammal Protection Act (MMPA) Section 101(a) (4), private property owners may deter marine mammals from hauling out onto docks and/or vessels and potentially endangering personal safety.

1.6 INTERGOVERNMENTAL COORDINATION

The Navy is working with the following agencies to obtain the necessary authorizations, concurrences, or permits for implementation of the project (in progress unless otherwise noted):

- USEPA and U.S. Army Corps of Engineers (USACE): Suitability for Unconfined Aquatic Disposal Determination (completed).
- USACE: Clean Water Act (CWA) Section 404, and Rivers and Harbors Act (RHA) Section 10, permits (the permit application has been submitted and the Navy anticipates an approved permit).
- U.S. Fish and Wildlife Service (USFWS): Concurrence on the informal Endangered Species Act (ESA) Section 7 consultation.
- National Marine Fisheries Service (NMFS): In compliance with the MMPA, the Navy would obtain an Incidental Harassment Authorization before implementation of in-water demolition and construction activities. Reauthorization would be needed for each 12-month period of activity. (The Incidental Harassment Authorization has been accepted.)
- NMFS: Concurrence on the Essential Fish Habitat (EFH) analysis and determination Regional Water Quality Control Board (RWQCB): CWA 401 Water Quality Certification. (EFH analysis has been accepted.)
- California Coastal Commission (CCC): The Navy consulted with the CCC on all project components. The CCC found the proposed project to be consistent, to the maximum extent practicable, with the California Coastal Management Program (see Appendix A).
- San Diego Air Pollution Control District (SDAPCD) potential permits: (to be obtained by the construction contractor before construction activities).
- USCG amendment to Security Zone 165.1102 for new pier headline and establishment of a temporary Security Zone for the Navy MMP at NMAWC.
- CSLC: lead agency for California Environmental Quality Act (CEQA) documentation.

1.7 PUBLIC AND AGENCY PARTICIPATION

Regulatory agencies participating in this project include USEPA, USACE, USFWS, NMFS, RWQCB, CSLC, USCG, and the CCC as described in Section 1.6. Appendix A documents the correspondence between the Navy and the regulatory agencies involved in this project.

Regarding the public involvement process, a public meeting notice was published in the San Diego Union Tribune on 28 April 2012 that initiated a 30-day public scoping period. The 30-day public scoping period began on 28 April 2012 and ended on 28 May 2012. A public meeting was held on 3 May 2012 at the Loma Portal Elementary School. A NOA for the Draft EA was published in in the San Diego Union Tribune on 20 October 2012 to initiate a 30-day public review of the Draft EA. The public review period of the Draft EA was 30 days beginning on 20 October 2012 and ending on 19 November 2012. A public meeting was held on 14 November 2012 at Portuguese Hall, San Diego. The Draft EA was made available to the public via the Navy website at www.piersystem.com/go/doc/4275/1355631/ and at the following local libraries: San Diego Central Library, Point Loma/Hervey Branch Library, and Ocean Beach Branch Library. Appendix B of this EA contains concerns raised by the public during the scoping and Draft EA public review periods, public comments received on the Draft EA, and responses to the comments. The FONSI/FEA were made available to the public at the Point Loma/Hervey Branch, Ocean Beach Branch, and Pacific Beach/Taylor public libraries and via the Navy website: www.piersystem.com/go/doc/4275/1355631/.

ORGANIZATION OF THE ENVIRONMENTAL ASSESSMENT

Following Chapter 1, this EA is organized as follows: Chapter 2 describes the Proposed Action and alternatives; Chapter 3 describes the affected environment and the environmental consequences of each alternative; Chapter 4 describes the cumulative impacts of the Proposed Action and alternatives in conjunction with other past, present, and reasonably foreseeable projects in the area. Chapter 5 describes various other considerations required by NEPA. This is followed by persons, entities and agencies contacted (Chapter 6), a list of preparers and their qualifications (Chapter 7) and references (Chapter 8).

CHAPTER 2
PROPOSED ACTION AND ALTERNATIVES

This chapter includes the reasonable alternative screening criteria, a description of the Proposed Action and alternatives, and alternatives considered but not carried forward for detailed analysis. It also includes a brief summary of the anticipated environmental impacts that would occur from each alternative.

2.1 REASONABLE ALTERNATIVES SCREENING FACTORS

The screening factors used to select reasonable alternatives that would allow mission, operational, and support functions to be fulfilled for modern United States (U.S.) Navy ships are as follows:

- Location within a U.S. Coast Guard (USCG) Security Zone in waters offshore of Naval Base Point Loma (NBPL) where the pier fuel supply lines will align with shoreside access to Fleet Logistics Center (FLC) Fuel Facility NBPL fuel storage tank facilities. The new pier location must be such that minimal onshore excavation and construction are needed to connect the pier to the new fuel storage facilities that are in the process of being replaced on NBPL under military construction project P-401.
- New pier footprint achieving a minimum approach segment (the portion of the pier that connects to the shore) width of 50 feet (ft) while minimizing overall square footage and associated potential risks and effects to biological resources such as Essential Fish Habitat (EFH) and eelgrass beds and encroachment into navigable waters.
- Ability to accommodate mooring and fueling of all classes of Navy and Department of Homeland Security (DHS) vessels other than those that are nuclear-powered, e.g., the nuclear-powered class aircraft carriers and the nuclear-powered submarines. The fuel pier must be able to fuel one of the following vessels: military sealift replenishment "oiler" vessel (T-AO [649 ft long]); large, medium speed roll-on/roll-off ship (T-AKR [956 ft long]); or landing platform dock (LPD [684 ft long]) (Naval Facilities Engineering Command [NAVFAC] Southwest 2011c). To accommodate the T-AO the pier must have a minimum 1,095 ft of outboard mooring length with sufficient water depth (-40 ft mean lower low water [MLLW]).
- Provide greatest versatility in accommodating the wide range of vessels that use the fuel pier. A higher elevation fuel pier deck would be better suited to handle the larger vessels, with their higher top deck elevations (Navy 2010a). The height would provide additional reach for fuel load arms to safely reach fuel transfer points on the majority of larger Navy and DHS classes of ships, such as the new double hulled commercial tankers, dry cargo/ammunition ships (T-AKEs,) and older fast combat support ships (T-AOEs) (Navy 2010c).
- Pier design to maximize separation of fuel pipelines from pier deck vehicles and activities.

- Pier dimensions that meet Department of Defense (DoD) Unified Facilities Criteria (UFC). UFC are facility planning, design, construction, operations, and maintenance criteria for DoD components and participating organizations (Appendix C). As directed by the Office of the Deputy Under Secretary of Defense letter dated May 2001 and DoD Directive 4270.5 dated 12 February 2005, UFC apply to all DoD construction, repair, and maintenance projects (DoD 2006). UFC require a minimum of 50 ft of open deck width to ensure a safe operating area for personnel, forklifts, cranes, and fuel hose storage during fueling operations.
- Maintain operational capabilities at the existing fuel pier with no more than 45 days total downtime during the duration of the construction contract, which is estimated to require 4 years to complete (Navy 2012a). Operational requirements are defined by 2-4 fuel replenishment vessels per month (oilers), 5-7 U.S. Navy fuel oil barges per month, 8-10 Navy and/or DHS vessels per month, and 13-20 small craft per month.
- Configuration to meet Navy Region Southwest (NRSW) anti-terrorism/force protection requirements as well as 33 Code of Federal Regulations (CFR) Part 6.01.5 and 33 CFR 165.1104, with a security zone of 500 ft on all sides as defined by 33 CFR 154.735(v).

2.2 ALTERNATIVES CONSIDERED

Three alternatives are carried forward for detailed analysis in this Environmental Assessment (EA): Alternative 1 Pier Replacement and Associated Dredging; Alternative 2 Delayed Dredging Alternative; and the No-Action Alternative. Section 2.2.4, Alternatives Considered but Not Carried Forward for Detailed Analysis describes in detail why no other pier designs were carried forward for detailed analysis in this document.

2.2.1 Alternative 1 Pier Replacement and Associated Dredging

The scope of Alternative 1 would include the following five key elements, which are described in greater detail in the subsections shown.

- ***Temporary Relocation of the Navy Marine Mammal Program (MMP) (Section 2.2.1.1) –*** Before the pier replacement activities begin, the Navy MMP, which is administered by Space and Naval Warfare Systems Center (SSC) Pacific, would be temporarily relocated to the Naval Mine and Anti-Submarine Warfare Command (NMAWC), part of NBPL that is over 3 kilometers (km) away from the fuel pier (SSC Pacific 2011a) (Figures 2-1 and 2-2). Limited construction at NMAWC would occur. The floating enclosures and the Navy marine mammals would be moved incrementally from the existing MMP location to the temporary NMAWC location. After completion of the new fuel pier, the Navy marine mammal enclosures and the animals would be moved back to their original location adjacent to the fuel pier, and the temporary facilities at NMAWC would be removed.

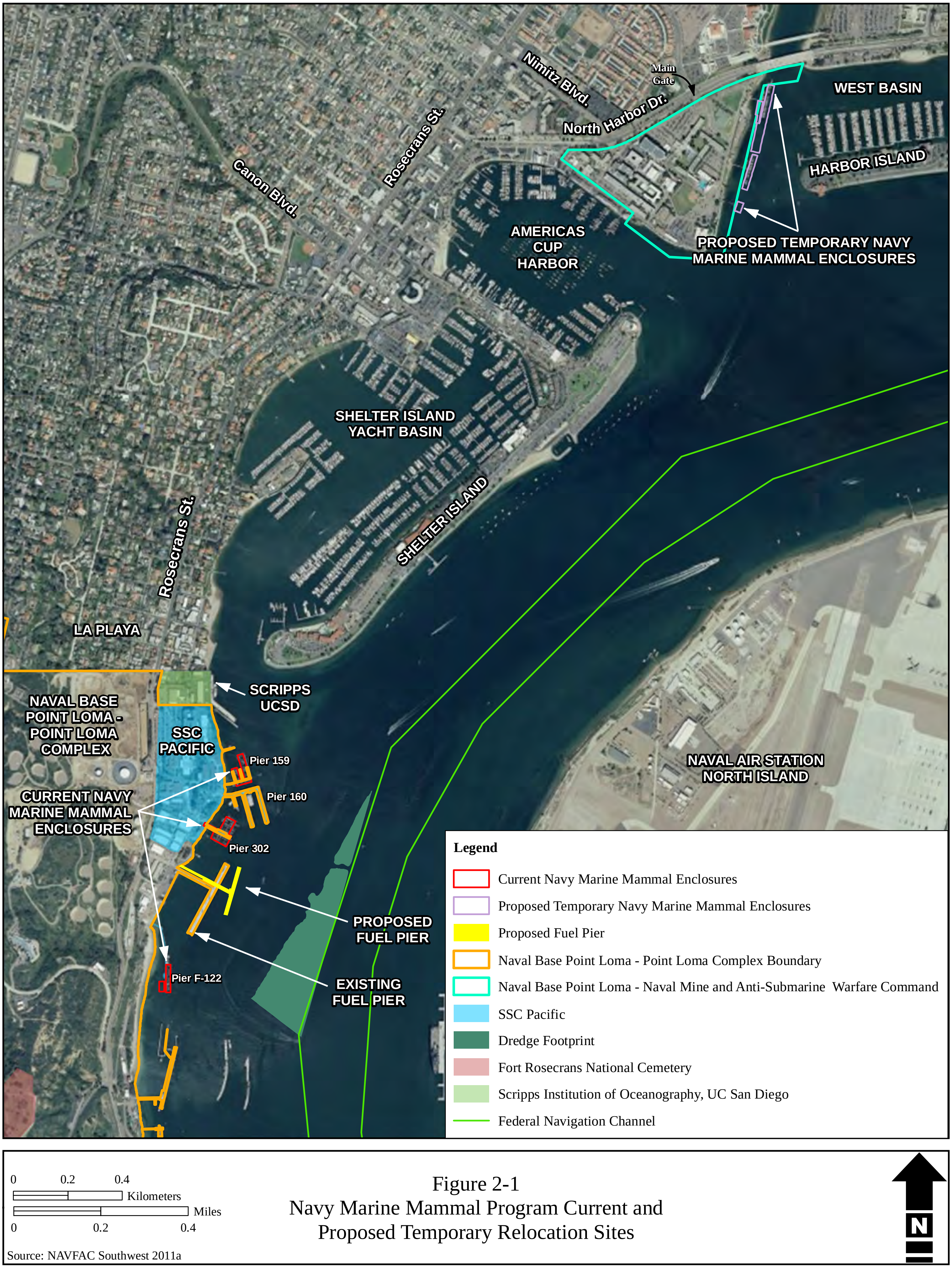


Figure 2-1
Navy Marine Mammal Program Current and Proposed Temporary Relocation Sites

Source: NAVFAC Southwest 2011a

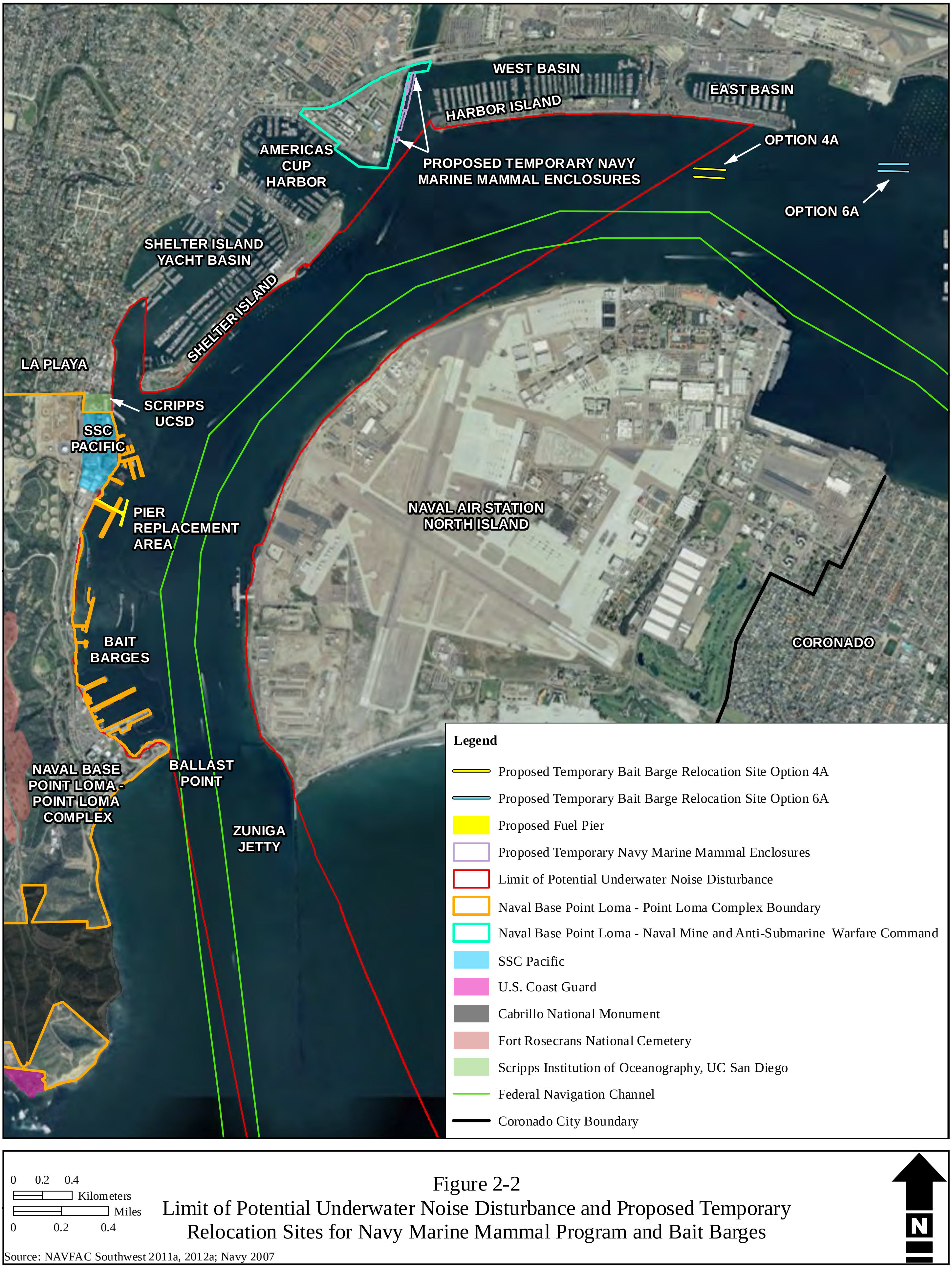


Figure 2-2
Limit of Potential Underwater Noise Disturbance and Proposed Temporary Relocation Sites for Navy Marine Mammal Program and Bait Barges

Source: NAVFAC Southwest 2011a, 2012a; Navy 2007

- ***Phased Demolition and Removal of the Existing Fuel Pier (Section 2.2.1.2) –*** Demolition and removal of the existing Fuel Pier would take place in two phases to maintain the fueling capabilities of the existing fuel pier while the new pier is being constructed. The fuel pier has sufficient staff qualified to carry out fueling operations throughout the demolition and construction period, and to operate the new pier when it becomes operational. No additional personnel would be assigned to the new fuel pier (Navy 2012b).
- ***Phased Construction of a Replacement Fuel Pier (Section 2.2.1.3)*** – A new, double-deck fuel pier would be constructed that would provide flexibility in fueling multiple vessel types, meet MOTEMS requirements for seismic performance, and have a total area that is 5,315 square ft (sf)/0.12 acre (ac) smaller than the area of the existing fuel pier. There would be no pile driving or other in-water construction or demolition during the least tern breeding season, from 1 April through 15 September of each year that the project is ongoing. Due to these restrictions on in-water construction, pile driving could take up to 3 years to complete.

  Regulated Navigation Zones (Section 2.2.1.4) – The existing USCG Security Zone would be amended as needed to provide an adequate security zone to the east for the proposed new fuel pier alignment. A temporary Security Zone would be established to a distance of 100 ft offshore from the proposed temporary Navy marine mammal relocation site at NMAWC for the period that the Navy marine mammals are present.
- ***Dredging and Sediment Disposal (Section 2.2.1.5)*** – Dredging and sediment disposal are needed to deepen a high spot in an existing turning basin, so that the basin can safely accommodate current and future deep draft berthing capabilities. Ocean disposal of dredge sediments was considered and approved by the U.S. Environmental Protection Agency (USEPA) and U.S. Army Corps of Engineers (USACE), but USEPA specified beneficial reuse for nearshore replenishment as the appropriate placement. Under Alternative 1, dredging in the existing turning basin to accommodate deep-draft berthing capability could be done before, during, or shortly after the pier replacement effort and could potentially occur while the Navy MMP is at its existing location, so long as pier replacement has not begun. However, there would be no dredging during the California least tern breeding season (1 April to 15 September). The resource-specific analysis in this EA is based on dredging occurring concurrently with pier replacement.

Temporary Relocation of Everingham Brothers Bait Company Bait Barges – Although not an element of the P-151 NBPL Fuel Pier Replacement Project, the P-151 EA addresses the temporary relocation of the Everingham Brothers San Diego Bay bait barges. The Navy is not relocating the bait barges. The viable bait barge relocation options and potential environmental impacts of relocating the bait barges are discussed in this EA. Following adoption of a Finding of No Significant Impact (FONSI) for this project, the Everingham Brothers Bait Company and the California State Lands Commission (CSLC) would be expected to execute a lease for a relocation site.

2.2.1.1 Temporary Relocation of Navy Marine Mammal Program

The Navy MMP in-water animal enclosures, which house its military working dolphins and sea lions, are located at Piers 159, 160, and 302 to the north of the fuel pier, and Pier F-122 to the south (see Figure 2-1).

The Navy is authorized to hold its marine mammals under the Defense Authorization Act of 1987, *Marine Mammals: Use for National Defense Purposes* (10 U.S. Code [USC] 645 Section 7524). Similar to other military working animal programs, the Navy MMP maintains a program of animal care that meets or exceeds U.S. Department of Agriculture Animal and Plant Health Inspection Service regulations in accordance with the Animal Welfare Act. However, as a U.S. government organization, the Navy MMP does not require a license from the Animal and Plant Health Inspection Service and is not subject to inspections. Rather, per DoD Directive, the Navy MMP is accredited by the Association for Assessment and Accreditation of Laboratory Animal Care International, a private nonprofit organization that promotes the humane treatment of animals in science through a voluntary accreditation program. This organization evaluates facilities that use animals in research, teaching, or testing and accredits those that exhibit excellence in animal care. In addition, the Navy MMP is a member of the Alliance of Marine Mammal Parks and Aquariums, a nonprofit organization of the world's preeminent marine mammal facilities that together have significant influence in shaping the current and future domestic and international regulatory and policy framework. The Alliance has developed standards and guidelines for animal care, personnel training, and education that are increasingly being adopted as the world standard for the marine mammal community. Per 10 USC 645 Section 7524, the Navy's authorization to hold marine mammals applies without regard to the provisions of the Marine Mammal Protection Act (MMPA) administered by the U.S. Department of Commerce National Marine Fisheries Service (NMFS), and its animals are not a coastal resource under the Coastal Zone Management Act (CZMA) (Navy 2007). The Navy's marine mammals are being relocated so that they will not be affected by noise and vibrations associated with demolition/construction-related activities. Temporary relocation of the existing MMP is also needed to safely maintain the Navy's program of excellence in marine mammal care during the fuel pier demolition and construction activities.

The Navy investigated 13 sites (including the chosen NMAWC site) at various locations around San Diego Bay to find a suitable temporary location for the MMP. An engineering study was prepared for the development of alternatives, including concept level plan and rough-order-cost estimate for each alternative (Moffatt & Nichol–Blaylock [MNB] 2011a [*FY 2013 MCON P-151 Replace Fuel Pier, NBPL Rough Order Magnitude (ROM) Cost – Mammal Pier Relocation Five Alternatives plus Optional Sites]* available for review at the NBPL Public Affairs Office). The study addressed pros and cons for each alternative; all impacts to existing site conditions, and a discussion of method of relocation and associated construction timeline. The sites were evaluated according to distance to the existing SSC Pacific site; security; SSC Pacific operational criteria; distance to open ocean; capacity to relocate all the Navy marine mammals at a single consolidated site; existing infrastructure that includes a veterinarian clinic, food freezers, and specialized operational equipment and onshore space; adequate water depth, wave conditions, water hydraulic conditions; and other criteria for the animals. Table 2-1 presents the alternative relocation sites that were evaluated, but determined to be unsuitable.

Because Navy-owned sites offer advantages in terms of security and real estate that non-Navy property does not, the temporary relocation site was selected from the four Navy-owned sites. Described below are the two best alternative Navy sites that were considered but eliminated.

Naval Amphibious Base Coronado Pier 21 with Explosive Ordnance Disposal (EOD) Mobile Unit 3/Naval Air Station (NAS) North Island Pier E – This site offers improved security, the need for minimal in-water improvements, and adequate water depth for the marine mammal enclosures (MNB 2011a). However, the SSC Pacific marine mammals would be separated into two groups: one located at NAB Coronado Pier 21 and the other at NAS North Island Pier E MNB 2011a). Furthermore, there is not enough available land near either of the sites to support all of the SSC Pacific onshore activities. At NAB Coronado, the SSC Pacific landside facilities would have to be placed on a sports field that is not adjacent to the Pier 21 area (MNB 2011a). NAS North Island Pier E has a similar lack of nearby onshore laydown space. The NAB Coronado Pier 21/NAS North Island Pier E site is also too far from the existing SSC Pacific marine mammal facility and the open ocean, exposed to boat wakes/waves, and may have water quality issues (MNB 2011a).

NBPL November Pier - Pier 5003 is the northernmost berthing pier at NBPL Submarine Base, about 0.6 mi south of the fuel pier, and is typically referred to as the "November" pier. The site offers improved security, proximity to existing SSC Pacific landside facilities, proximity to open ocean, and adequate water depth. However, there is insufficient available landside space for the SSC Pacific infrastructure. Parking space in the vicinity is extremely limited as well. Further, the facility is inside the Submarine Base floating security barrier, which would present an obstacle to the SSC Pacific daily boat operations.

Before demolition of the existing fuel pier, SSC Pacific would move the Navy marine mammal enclosures, associated equipment, and the animals from the existing location to the NMAWC property on the north side of San Diego Bay (SSC Pacific 2011a). Pier 619, recreational Marinas 548 and 607, Building 549, Building 606 (Navy Sailing Center Building) and associated parking spaces and open areas are suitable for temporary relocation of the Navy MMP and would be modified for use by the Navy MMP. There would be a 12-month design period, beginning in March 2012, followed by approximately 6 months of procurement processing and 6 months of concurrent landside and waterside construction involved with preparing the NMAWC site and relocating the marine mammals ([Moffatt, Nichol-Blaylock] MNB 2012a).

Table 2-1. Navy Marine Mammal Program (MMP) Potential Relocation Sites Considered but Eliminated

Site	*Facility Category*	*Landside Space for Navy MMP Activities and Laydown Area*	*Impacts to Existing Civilian Uses?*	*Security Level*	*Additional Rationale for Elimination*
NAB Coronado Pier 21/ NAS North Island Pier 3	Navy	Insufficient	No	High, Sufficient	• Too far from SSC Pacific NBPL and open ocean* • Exposure to waves/boat wakes and lacks developed utility infrastructure • Potential water quality issues
NAS North Island, near Berths J and K	Navy	Insufficient	No	High, Sufficient	• Site lacks existing infrastructure • Exposed to waves/boat wakes
NBPL November Pier (Pier 5003), North Side	Navy	Insufficient and extremely limited	No	High; Sufficient	• Necessary waterside improvements would be extensive • Facility is inside the Submarine Base's floating security barrier, an obstacle to SSC Pacific daily small boat operations
Tuna Harbor, South of G Street Mole Pier	Non-Navy	Insufficient	Yes	Minimal	• Too far from SSC Pacific NBPL and open ocean*
Harbor Island East (Adjacent to the former Ruben E. Lee Restaurant)	Non-Navy	Insufficient	Yes	Minimal	• No existing waterside improvements • Construction of a pile-supported stub pier long enough for a davit crane to lift mammals would impact eelgrass
Shelter Island Fishing Pier	Non-Navy	Insufficient	Yes	Minimal	• Required floats and guide piles may intrude into the navigable waterway
Driscoll's Wharf, Adjacent to NMAWC	Non-Navy	Sufficient	Yes	Minimal	• Facility is in poor condition • Limited depths may eliminate use of near-shore portions of the facilities
Grape Street Piers	Non-Navy	Insufficient	Yes	Minimal	• Pier 2 is in poor condition and would require structural rehabilitation • Too far from SSC Pacific NBPL and open ocean*
Embarcadero Wharf	Non-Navy	Insufficient	Yes	Minimal	• Too far from SSC Pacific NBPL and open ocean*
Former Campbell Shipyard Site	Non-Navy	Insufficient	Yes	Minimal	• Mammal pen layout would need to avoid the shallow marine habitat pier • Too far from SSC Pacific NBPL and open ocean*
Embarcadero Marina Park	Non-Navy	Insufficient	Yes	Minimal	• Would require considerable waterside infrastructure development • Too far from SSC Pacific NBPL and open ocean*
Crosby Street Pier, Adjacent to 10th Avenue Marine Terminal	Non-Navy	Insufficient	Yes	Minimal	• Site access is problematic, crossing a Burlington Northern Santa Fe rail track • Too far from SSC Pacific NBPL and open ocean*

Note: *Proximity to existing SSC Pacific site needed to transport food and other needed supplies/equipment to the temporary relocation site.
Source: MNB 2011a.

Navy Morale, Welfare, and Recreation (MWR) operates the facilities at Building 606 and Marinas 548 and 607 (MNB 2011a). It is anticipated that these facilities would be vacated for use by the Navy MMP (MNB 2011a). Building 549 (MWR waterfront rental cottage located onshore west of Pier 548) would be vacated and closed. The Navy MMP would use the shoreside area around Building 549 and free-standing restrooms, but not the building interior. Some of the privately-owned boats at Marinas 548 and 607 may relocate to the Navy MWR facility at Fiddler's Cove Navy Marina at Naval Amphibious Base (NAB) Coronado or the MWR marina facility at Camp Pendleton; others may relocate to other marinas in San Diego Bay or Mission Bay. Some owners may elect to remove their boats from the water. The Navy MMP would remain at the temporary facilities at NMAWC for approximately 4 years and would return to the existing SSC Pacific site when fuel pier construction is complete.

The Navy EOD Training and Evaluation Unit One uses Pier 619 (NAVFAC Southwest 2012b). This EOD unit would exchange places with another EOD unit, Mobile Unit 1, that uses a pier at NBPL. EOD Mobile Unit 1 is associated with the Navy MMP, so their temporary transfer to NMAWC would be compatible with the proposed SSC Pacific use (NAVFAC Southwest 2012b). NMAWC land use in the area surrounding the proposed temporary relocation facilities includes classroom training, barracks, and the Admiral Kidd Club conference center (NAVFAC Southwest 2011d). Temporary use of the Navy marina facilities and Pier 619 by SSC Pacific would be compatible with these surrounding uses.

With the complete relocation of the current occupants from the NMAWC site and use of the existing landside and waterside improvements (e.g., all three piers, Building 606, and the lawn and parking areas) there would be sufficient space to relocate the Navy marine mammal facilities to NMAWC (MNB 2011a). The proposed arrangement also results in the Navy marine mammal enclosures being placed as close to the shoreline as the water depth would allow, which would avoid impact to eelgrass offshore from NMAWC while minimizing intrusion into the bayside channel used by Harbor Island West boat traffic (MNB 2011a). The relocated marine mammal enclosures at NMAWC are proposed to have a 100 ft-wide security zone. This 100 ft-wide security zone is also in place at the existing SSC Pacific location.

A total of 204 SSC Pacific personnel associated with the Navy MMP would be temporarily stationed at the NMAWC (SSC Pacific 2011b). Of these, approximately 174 would be present during peak hours (SSC Pacific 2011b). The landside facilities required for the Navy MMP at NMAWC include: parking spaces for 174 vehicles, temporary locker room facilities for 204 personnel, restroom facilities for 174 personnel, dive lockers and equipment storage, and a concrete pad and associated pump intake infrastructure to support shoreside Navy MMP quarantine pools (MNB 2011a, SSC Pacific 2011a). There would be a net increase of 5 to 30 parking spaces at NMAWC, depending on the final structure layout. Navy MMP Food preparation facilities and the veterinary clinic would not be relocated (NAVFAC Southwest 2011d). Space in the existing Navy-owned parking lot on the north side of North Harbor Drive, at the intersection of Nimitz Boulevard and North Harbor Drive, would be available for Navy MMP personnel (NAVFAC Southwest 2011d). Some of the MWR landside grass areas may be used to locate storage units and other portable and temporary infrastructure (MNB 2011a).

Minor shoreside construction, including trenching, may be necessary to expand or upgrade the existing electrical distribution system to support the increased requirements of the Navy MMP.

No natural beach shoreline would be disturbed or shadowed at NMAWC, where the shoreline is reinforced with rock rip-rap. There would be minimal in-water construction at the NMAWC site (MNB 2011a). It is anticipated that 32 (13 12-inch [in] square and 19 16-in diameter) existing guide piles at NMWAC would be relocated (i.e., removed and re-driven), and 46 new 16-in diameter guide piles would be installed (MNB 2013). The guide piles would be installed with an impact hammer pile driver (steam or diesel) that meets the criteria for the bearing capacity of the foundation soils (MNB 2013). Four of the new 16-in diameter piles would be placed approximately 3 ft east (bayward) of the marine mammal enclosures, with signs advising the public of the 100 ft security zone.

The piles would be transported to the NMAWC site by barge (MNB 2011b). The guide piles would function as anchors for the floating enclosures and walkways. After the guide piles are installed at NMAWC, the floating enclosures and walkways would be disconnected from their current locations at the piers north and south of the existing fuel pier (Figure 2-1), towed to the NMAWC site, and connected to the piers and guide piles at the NMAWC site (MNB 2011c). Some welding would be done when installing the brackets to connect the floating walkways and enclosures to the piles (SSC Pacific 2011a).

The suitable portions of existing waterside infrastructure (access brows, floats, guide piles, utilities and miscellaneous appurtenances) located at NMAWC would be expanded as described above. The SSC Pacific waterside mammal facilities that would be relocated to the NMAWC site include:

- Existing 60 ft x 90 ft floating dolphin “pod” enclosures (14 total pods). The 60 ft x 90 ft elements are composed of 30 ft-square basic elements.
- Existing 30 ft x 30 ft dolphin enclosures (11 total). These are typically used to connect larger enclosures.
- Existing approximately 8,000 sf floating training lagoon.
- Existing 30 ft x 30 ft floating sea lion enclosures (8 total).
- Existing floating walkways (marina-type floats). These are used as workspace and to connect enclosures to piers or guide piles. SSC Pacific has 8 ft x 20 ft floating walkways that can be relocated (10 total).
- Existing 30 ft x 30 ft floating equipment huts (8 total).

The following new equipment would be constructed at the NMAWC site:

- One 4-ft minimum (interior clear width) aluminum access gangway to be located at Pier 548 to reach the floating walkways. The existing gangway at NMAWC Pier 607 is adequate. The gangway located at Pier 619 would remain.
- One new 1-ton (minimum) davit crane to remove the animals from the water, with a concrete pier support structure adjacent to the outboard end of Pier 548. The new pier structure support structure would have a minimum of 225 sf of laydown area for animal transfer.

- Two new high capacity pumps and 220 volt/3-phase electrical power. These pumps would be used to intake seawater used for the shipboard pool simulators.
- Conventional float-supported electrical and potable water service.
- Lighting to support night-time operations.

The Navy marine mammal enclosures would be moved in conjunction with favorable tides. As enclosures are being moved, the animals that were living in those enclosures would be temporarily housed in the remaining existing enclosures (SSC Pacific 2011a). To avoid crowding, a few enclosures would be moved at one time, completely re-installed and made ready for the animals, and then those animals would be relocated to NMAWC. This incremental process would be repeated until all the enclosures and animals have been transferred to the NMAWC site. Up to four 25 ft–long small boats with dual 225 horsepower outboard engines would be used for towing the floating structures to NMAWC, and for maneuvering them into position (SSC Pacific 2011a). It is anticipated that approximately 90 days would be required to move all the enclosures and animals to NMAWC (SSC Pacific 2011a). The Navy MMP use of the NMAWC site would include feeding, training, and housing the animals inside the enclosures; transferring them into and out of the water with the crane; and training them in onshore shipboard pool simulators. Navy MMP personnel would also operate their small boats inside and outside the proposed 100-ft wide security zone, and clean their boats and the animals' enclosures with potable water.

The temporary Navy marine mammal enclosures would extend about 150 ft beyond the NMAWC boundary into state waters, and a the proposed 100-ft wide temporary security zone would be established around them (see Section 2.2.1.4). However, approximately 358 ft of open water would remain for navigation between the temporary security zone and dock facilities on West Harbor Island. There would be about 480 ft of open water between the temporary security zone and the western end of West Harbor Island.

While the Navy MMP is at the NMAWC site, the current location next to the fuel pier would be generally vacant except for transporting food and equipment to and from the relocation site (NAVFAC Southwest 2011e). At the end of the construction period, the floating walkways, enclosures, and the animals would be moved back to the current Navy MMP location beside the new fuel pier following the incremental process described above. After all the floating walkways and enclosures are removed, the guide piles would be extracted by a barge-mounted crane, placed on the barge, and towed away to a recycle/resell site (MNB 2011c). One tug boat would be needed to move the barge. It is estimated that the guide piles would be removed within 1 week (MNB 2011c). The contractor would likely reinstall the guide piles at other marina locations, so there would be no demolition debris (MNB 2011c). A small landside crane would offload the piles at the recycle/reinstall site (MNB 2011c).

2.2.1.2 Phased Demolition and Removal of the Existing Fuel Pier

Demolition and construction would occur in two phases to maintain the fueling capabilities of the existing fuel pier while the new pier is being constructed. Each of the utilities, systems, and pier features would be demolished as described in this section, but on a segment-by-segment basis to allow for continuous fueling operations during demolition and construction. Table 2-2 summarizes the work that would be done in each phase, and the durations of each phase. Details of the demolition and construction work follow Table 2-2.

Table 2-2. Construction Phase Summary

PHASE ONE (approximately 3 years)	
1	Initial mobilization of equipment to the site, set up temporary office space
2	Temporary relocation of Navy MMP to NMAWC
3	Temporary relocation of Everingham Brothers Bait Company bait barges
4	Indicator Pile Program - Drive approximately 12 piles (several of them will be driven twice: once to the tip elevation, and again after 48 hours to check the set-up strength)
5	Construct temporary mooring dolphin south of existing fuel pier
6	Demolish north segment of the existing fuel pier
7	Construct abutments at landside end of approach segment for the new fuel pier
8	Construct portions of landside utilities and relocations
9	Construct the new pier: ramped approach pier (lower and upper deck), two northern mooring dolphins, and double deck fueling pier
10	Connect/construct fueling lines to new pier and begin fueling at the new fuel pier
PHASE TWO (approximately 1 year)	
1	Construct southern berthing dolphin and mooring dolphin
2	Demolish remainder of existing fueling pier (approach and south segments)
3	Complete abutment construction
4	Remove temporary mooring dolphin
5	Complete grading, paving, and landside utility work
6	Demobilize equipment from site, remove temporary offices

Notes: Under Alternative 1, dredging could be done any time before, during, or shortly after construction of the new fuel pier. Under Alternative 2, dredging would be done years after construction of the new fuel pier is completed. Total duration of demolition/construction is estimated to be approximately 4 years. Under either alternative, no dredging would take place during the least tern breeding season, 1 April to 15 September.

Source: MNB 2012b.

Facilities to Be Removed

Alternative 1 would include demolition and removal of the existing fuel pier and its associated fueling systems. The majority of the work would be conducted over water and would include removal of the pier, pilings, plastic camels, and fenders. All utility infrastructure would be removed, including water and sewer pipelines, lighting systems, and wiring. The fueling systems, including piping and pipe supports, would also be removed. Facility information for the existing fuel pier is included in Table 2-3.

Table 2-3. Existing Fuel Pier (Pier 180) Information

Existing Pier 180	*Pier Specifications*
Installation	NBPL, San Diego, California
Activity	Naval Supply Systems Command (NAVSUP) FLC Fuel Facility
Facility Name	Fuel Pier (Pier 180)
Pier Area	71,180 sf
Description	T-shaped fuel pier, consisting of three sections with concrete deck
Approach Segment	Built in 1908, Size: 34 ft x 500 ft, timber support piles, steel caissons and superstructure, plastic fender piles
North Segment	Built in 1908, Size: 50 ft x 349 ft, timber support piles, steel caissons and superstructure, plastic fender piles
South Segment	Built in 1942, Size: 60 ft x 598 ft, concrete support piles and superstructure, plastic fender piles
Function	Loading and off-loading of fuels and contaminated petroleum products (CPP)
Current Ship Loading	Average: 43 ships/month
Condition of Facility	Facility is aging, is in poor condition, and is seismically deficient
Major Structural Repairs	Repairs to four undermined caissons on the Approach Pier in 1957 and two additional undermined caissons in 1987. The 1987 repairs included the installation of a submerged steel sheet pile bulkhead to prevent further undermining of the caissons.

Source: Navy 2010a.

The fuel pier is part of FLC Fuel Facility NBPL, a bulk fuel storage and transfer facility that includes administrative and support facilities, fuel storage tanks, pumphouses, and pipelines (NAVFAC 2009). Figure 1-2 shows the FLC Fuel Facility NBPL storage tanks located onshore northwest of the fuel pier. Fuel is supplied to FLC Fuel Facility NBPL by an onshore pipeline and tank vessels, and can be issued by the same systems (NAVFAC 2009). Table 2-4 lists the existing pipelines that run from the onshore FLC Fuel Facility NBPL storage facilities to the fuel pier (NAVFAC 2009). The fuel pier is also equipped with an 8-in diameter pipeline for offloading contaminated petroleum product (CPP) (a mixture of fuel and water) to be processed at the NBPL Defense Fuel Support Point (DFSP) Fuel Oil Reclamation (FOR) system (NAVFAC 2009).

Storage tanks, piping, and supporting infrastructure at the FLC Fuel Facility NBPL are in the process of being replaced under the P-401 construction project (Navy 2010a). Fifty-four existing underground and aboveground storage tanks are being replaced with eight new, DoD multi-product, aboveground bulk fuel storage tanks with the same storage and operational capacity as the existing tanks (42 million gallons). The new fuel storage facility is being rebuilt at the same location because of established access to existing supply pipelines and to the fuel pier (Navy 2007). P-401 improves onshore fuel and piping and transfer systems between the new storage tanks under construction and the fuel pier (existing and proposed) (Navy 2007). Pumping, piping, and discharge requirements would be in accordance with 33 CFR 157.11, *Pumping, Piping and Discharge Arrangements* (Navy 2010c).

Table 2-4. Existing Fuel Pier (Pier 180) Pipeline Diameters and Contents

Pipeline Diameter (inches)	*Contents*
16	JP-5
16	DFM
10	DFM
8	JP-5
8	CPP
6	Lubricating oil

Notes: DFM = diesel fuel marine, JP-5 = jet fuel, CPP = contaminated petroleum products.
Source: NAVFAC 2009.

The P-401 demolition and construction project also includes removal of eight aboveground lubricating oil storage tanks located beside the quay wall immediately north of the fuel pier. The P-401 project has completed a new lubricating oil facility elsewhere on NBPL, including approximately 2,000 linear ft (lf) of piping to connect it to the proposed new fuel pier (Navy 2007).

Also included in the fuel storage facility replacement project are demolition of Buildings 110 (two-story wooden control tower) and 140 (single-story wooden storage building) on the fuel pier (Navy 2007, 2010d). As part of P-401, a new control tower is being constructed onshore on the site vacated by the removal of the existing lubricating oil storage tanks (Navy 2007). The domestic water and sewer lines that serve the existing control tower Building 140 on the fuel pier would be cut and capped at the shore under P-401 (Navy 2010c). The abandoned water and sewer utilities would be removed during the demolition of the fuel pier.

In addition to fueling vessels, FLC Fuel Facility NBPL supplies JP-5 (jet fuel) to NAS North Island across San Diego Bay to the east through two underwater pipelines (NAVFAC 2009). The NAS North Island pipelines are not included in the fuel pier or fuel storage facility replacement project (Navy 2007, 2010a). However the NAS North Island pipelines are in the fuel pier replacement project area, both onshore and offshore. The Navy would work with contractors to establish a safety buffer zone between the pipelines and the demolition and construction work zone footprint and would ensure that all contractors' equipment and vessels remain outside the buffer zone during demolition and construction.

<u>Demolition Process</u>

Hazardous Material Abatement. In 2009, Ninyo and Moore conducted a visual hazardous materials survey at the fuel pier (Navy 2010d). Hazardous materials described in Section 3.7.2 were identified and confirmed through laboratory analyses. Hazardous lead paint removal and asbestos-containing material (ACM) abatement would be completed by licensed contractors before demolition, as described in Section 3.7.3. The construction contractor would use the Navy's manifesting procedures for hazardous wastes.

Mechanical and Electrical Utilities. Shoreside, all water and sewer laterals connected to the fuel pier would be cut and capped at the mains to prevent the formation of dead-end pipes in the water and sewer systems. Underground utilities would be located before performing any drilling or excavation work at the site. All electrical and mechanical utilities would be properly terminated before demolition. Demolition of utilities under the pier would occur with a hydraulic crane from the pier topside, or a barge mounted crane. Salvageable piping and electrical materials would be loaded in dumpsters and transported to a local recycling facility. This work would occur concurrently with the hazardous material abatement.

Fueling System and Pipelines. All liquids, solids, or sludges would be evacuated from the fuel and CPP systems, and the systems and pipelines would be cleaned. The same procedure would be applied to the potable water and sewer lines that supply Building 140 on the fuel pier. All pipelines would then be properly terminated at the shoreline and dismantled topside. Salvageable metal would be loaded in dumpsters and transported to a local recycling facility. This work would occur concurrently with the hazardous material abatement.

*Cleat and Bollard Bases***.** This work would be performed with a mini-excavator with a concrete breaker. All bollards and cleats would be hauled away for recycling. This operation would occur concurrently with the removal of the pier deck.

Plastic Fendering System. This work would be performed from a barge-mounted crane. Salvageable materials from this demolition process would be loaded onto flatbed trucks and hauled away for recycling. All other materials removed from the fendering system would be sized and hauled away to an approved disposal facility. This work would occur concurrently with the hazardous material abatement.

Concrete Deck and Pier Pilings. Typical pier demolition takes place bayward to landward and from the top down. Table 2-5 lists the types and numbers of piles to be removed. First, the fender piles and exterior appurtenances (such as utilities and the fuel piping systems) would be demolished above and below the pier deck. Then, the deck would be demolished using concrete saws and a barge-mounted excavator equipped with a hydraulic breaker (MNB 2011d). Next, structural and fender piles would be demolished.

Table 2-5. Existing Fuel Pier (Pier 180) Piles to be Removed

Pile Type	***Number***
Concrete structural	569
Concrete fender	105
16-in steel pipe filled with concrete	24
Plastic fender	34
Wood	741
Total	**1,471**

Source: MNB 2011e.

An attempt would first be made to dry-pull the entire length of each pile with a barge-mounted crane. A vibratory hammer or a pneumatic chipper may be used to loosen the piles. Jetting (the application of a focused stream of water under high pressure) would be another option to loosen piles that could not be removed through the previous procedures. Piles that could not be pulled entirely would be cut at the mudline. Once extracted, the piles would be loaded on to a support barge where they would be floated over to the quay wall. On shore, the debris would be crushed onsite or hauled to a concrete recycling facility.

Figure 2-3 shows the location of the contractors' laydown area for materials, equipment, and concrete recycling. The contractor may also stage some equipment and materials on barges (NAVFAC Southwest 2011a).

The Navy would require the contractor to prepare and implement a comprehensive debris management plan that would address the types of construction and demolition debris, expected separation and retrieval methods, and disposal methods. The contractor would be required to use catch devices and sheeting to capture and contain debris and materials that may be produced by project activities. Accidental releases of debris to San Diego Bay would be prevented by placing floating booms around the site to provide a complete barrier to floating debris. Debris from work on demolition and construction barges would also be captured on-board the barges. All captured material would be swept and disposed of in accordance with the debris management plan.

To minimize impacts to eelgrass and minimize sediment disturbance, steel sheet pile bulkheads along the south side of the approach segment and the outboard side of the north segment would not be removed. The bulkheads protrude about 10 ft above the mudline, and preserve a remnant soil mound that lies beneath the approach pier and main pier structure (Terra Costa Consulting Group, Inc. 2010). This remnant soil mound was created by dredging the bay floor adjacent to the pier (Terra Costa Consulting Group, Inc. 2010). Original engineering plans for the sheet pile bulkhead indicate that it was covered in rock rip-rap (Terra Costa Consulting Group, Inc. 2010).

Discarded Military Munitions (DMM)

DMM may be present in the project footprint due to historical ammunition handling at the fuel pier. The construction contract would require the preparation of a Navy-approved Explosives Safety Submittal (ESS) to support all construction and demolition. An ESS is a document that details how Navy explosives safety standards are applied to ensure protection of personnel and Navy assets in the event of unintentional detonation.

Demolition Debris

The Navy's goal is to recycle 52 percent of project debris waste, which would be diverted from landfill disposal. All of the concrete debris (100 percent) would be recycled.

Four major types of debris would result from the demolition of the fuel pier: concrete, wood, steel, and plastic. Alternative 1 would be in accordance with the DoD Low-Impact Development Initiative requiring all demolition projects that take place after 2011 to recycle and divert materials from local landfills to the maximum extent practicable. Materials would be reused or recycled as appropriate. Materials that cannot be reused or recycled would be transported to a permitted landfill. No special permits would be required for disposal of non-hazardous solid waste. Debris would not be allowed to fall into the San Diego Bay.

Figure 2-3
Contractors' Laydown Area

Source: NAVFAC Southwest 2011a

Concrete debris would comprise the largest volume of demolition material, approximately 4,280 cubic yards (cy) (Navy 2010e). Concrete debris not crushed for onsite reuse would be hauled to an offsite concrete recycling facility and processed for reuse as bulk construction material such as roadway fill.

Wood debris, comprising approximately 741 potentially creosote-treated timber support piles, would be disposed at Miramar landfill in accordance with the NRSW special waste management policy (MNB 2011e, NRSW 2007).

Approximately 680 tons of steel debris and 4 tons of wiring (e.g., 34,000 lf of utility wires estimated at 4 ft per pound in weight [Navy 2010e]) would also be recycled or appropriately disposed as a requirement of the demolition contract (NAVFAC Southwest 2011f). Steel debris that could not be recycled would receive authorization from the NRSW solid waste management program for disposal at Miramar landfill (NAVFAC Southwest 2011g).

Approximately 3,100 lf of plastic fender material would be removed from the fuel pier (Navy 2010e). Reuse or recycling of the plastic fenders would be determined as appropriate. Any material not suitable for reuse or recycling would receive authorization from the NRSW solid waste management program for disposal at Miramar landfill (NAVFAC Southwest 2011g).

<u>Demolition/Construction Equipment and Phasing</u>

To avoid impacts to California least tern breeding habitat during the breeding season, in-water demolition and construction activities that generate underwater noise and/or turbidity that impact tern breeding would not occur from 1 April to 15 September. Details of the least tern season avoidance plan for Phase 1 and Phase 2 demolition activities are listed below.

Demolition of the Existing Pier North Segment (Phase 1)

- During least tern breeding season, the demolition activities would be limited to removal of the deck, underdeck, fender piles (pulled only, no vibratory or jetted removal), and all of the deck hardware.
- The removal of the caissons (6-ft diameter steel with 13 wood piles each [25 caissons and 325 12-in diameter wood piles total] and concrete topping) would take place outside the least tern breeding season. The caisson elements could be removed with a barge-mounted derrick crane. The crane can be used to grasp and lift large components such as caissons and piles with attachments such as wire slings or clamshell buckets (i.e., dredge buckets). When a wooden pile cannot be completely pulled out, the pile may be cut at the mudline using crane-attached hydraulic jaws and/or a diver-operated underwater chainsaw.

Demolition of the Remainder of the Existing Pier Approach and South Segments (Phase 2)

- During least tern breeding season, the demolition activities would be limited to removal of the deck, underdeck, fender piles (pulled only, no vibratory or jetted removal), and all of the deck hardware.
- The removal of the caissons in the approach segment (6-ft diameter steel with 13 wooden piles each [32 caissons with 416 12-in diameter wood piles total] and concrete

topping) would be accomplished outside the least tern breeding season and would be removed with a crane and attachments as described above, hydraulic jaws, and/or underwater diver-operated chainsaws to cut off the wooden piles at the mudline.

Demolition and construction work (including pile driving) would occur between the hours of 7:00 A.M. and 4:00 P.M., Monday through Friday (weekdays, daylight hours only). Demolition and construction contract specifications would provide work day and hour restrictions that are consistent with City of San Diego noise ordinances (MNB 2012b).

The new fuel pier would be constructed concurrently with demolition of the existing pier. The north segment of the existing pier would be demolished first while the existing approach and south segment would remain operational. Fueling capabilities would be provided by the south segment. During the estimated construction period of approximately 4 years, fuel pier operations would continue with no more than 45 days total downtime (Navy 2012a). As described below, the two phases are designed with some overlap to maintain operational capability and make full use of the available construction timeframe. Figure 2-4 shows the parts of the existing pier that would be demolished and the proposed new pier that would be constructed during the two phases of demolition/construction. As shown on this figure, the proposed project area at NBPL is a developed waterfront where no natural beach shoreline would be disturbed during demolition and construction.

To maintain continuous fueling capability, access to the existing south pier would be required as the project gets underway. Access to the new north pier would be required in later phases for both construction and fueling activities (MNB 2011d). According to engineering estimates there would be approximately 500 to 700 ft of open water between the pier construction activity and the dredging activity (MNB 2011d). Figure 2-5 shows the construction and navigation zones. In the event that construction and dredging take place concurrently, there would be sufficient space to accommodate both operations and normal nonmilitary boat traffic (Figure 2-5).

Construction and dredging activities would take place outside the federal channel. The new fuel pier construction zone is approximately 1,200 ft from the channel. The dredge footprint, where the dredge vessels would operate, lies outside the channel. Most of the vessels involved with the project would transit the channel intermittently, with the exception of the sediment transport barges that may make more frequent trips to the nearshore dredged material beneficial reuse site (described in Section 2.2.1.5).

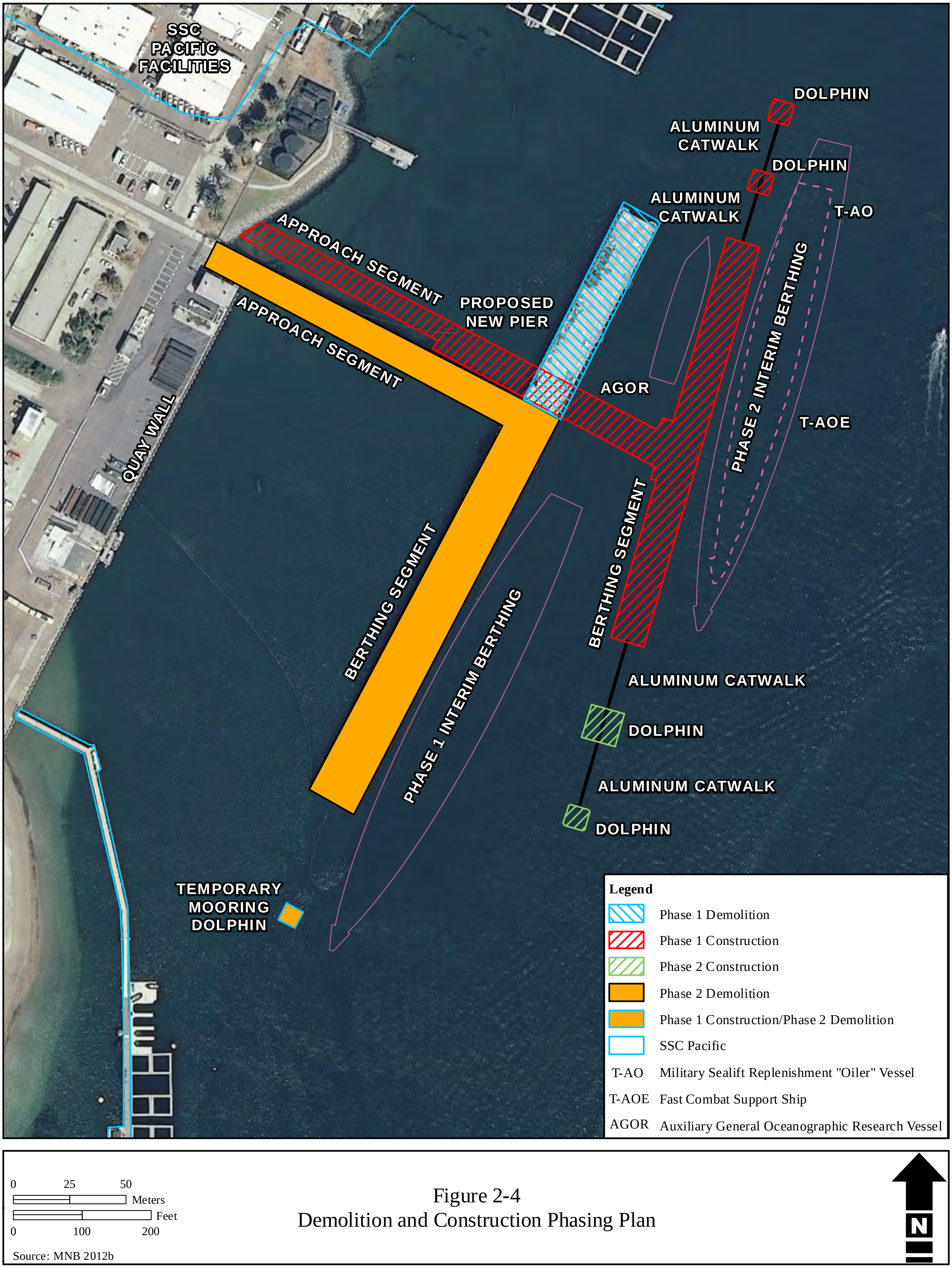


Figure 2-4
Demolition and Construction Phasing Plan

Source: MNB 2012b

Figure 2-5
Navigation/Construction Zone

Sources: NAVFAC Southwest 2011a; NOAA 2012

Phase 1 – Fuel Pier Construction: Project Indicator Pile Program, Temporary Mooring Dolphin, and North Segment Demolition (350 lf). A temporary mooring dolphin would be constructed to allow vessels to berth and load/unload fuel while the north segment of the existing pier is under demolition. Similar pile driving equipment and barges used to construct the temporary mooring dolphin would later be used to construct the new fuel pier (MNB 2012b). Approximately 12 steel pipe indicator piles (36-in and 48-in diameter, exact mix to be determined later) would be driven in the new pier alignment. The purpose of the indicator piles is to verify the driving conditions and establish the final driving lengths prior to fabrication of the final production piles that would be used to construct the new pier (MNB 2012b).

The north segment would be demolished by water access using barges to provide a working area for the crane and equipment (MNB 2011d). The demolition waste would be placed on two barges and hauled offsite for processing, recycling, and disposal. Water access is preferable for the heavy equipment and demolition waste to keep the existing pier operational during the demolition phase (MNB 2011d). Access to the existing pier is necessary for laborers, trucks, and removal of pier appurtenances. Some equipment used for demolition may include hydraulic hammers mounted to back-hoes for breaking concrete, front-end loaders, fork-lifts, concrete saws, steel cutting torches, and excavators with hydraulic thumb shears (MNB 2011d). The floating barges would be supported by tug boats and small work boats (MNB 2011d). While demolition of the north segment of the existing fuel pier is underway, the steel piles for the new pier approach segment would be fabricated offsite and transported to NBPL. Other construction equipment needed for Phase 2 would be mobilized to NBPL within this time.

Phase 1 – Construction of Approach Pier (Connection to Shore) (700 lf), Berthing Segment and North Mooring Dolphins 1,100 lf total for segment plus two dolphins). The new approach segment, berthing segment, and two north mooring dolphins would be constructed concurrently. It is not necessary to wait for the complete demolition of the existing pier north segment to begin construction. The approach pier construction would begin after the piles have been fabricated offsite and delivered (MNB 2012b). The piles would likely be delivered by barge (MNB 2012b). The approach pier construction would require two barge-mounted cranes, one with a pile driving rig and one for constructing the pier (MNB 2011d). Two additional barges would be used to store the piles, concrete formwork, steel reinforcement, and precast concrete deck sections. The floating barges would be supported by tug boats and small work boats. Construction from shore and/or the remaining fuel pier approach segment is a possibility for a small percentage of the work (MNB 2011d). Additional equipment would include front-end loaders, fork-lifts, steel welding and cutting equipment, concrete placement and finishing equipment, concrete saws and drills, and carpentry tools for building formwork (MNB 2011d). Materials delivered by truck may include concrete, reinforcing steel, utility pipes, and other miscellaneous construction materials. When the new berthing segment and mooring dolphins are completed, aluminum catwalks would be constructed to connect them.

Phase 2 – Construction of South Dolphins, and Demolition of Existing Approach Pier, South Pier, and Temporary Mooring Dolphin. Construction of the south berthing and mooring dolphins would begin after the new approach and berthing segments and north dolphins from Phase I are operational. Aluminum catwalks would be constructed connecting the south dolphins to the berthing segment. The existing south pier, approach pier, and the temporary mooring dolphin would be demolished concurrently with construction of the new south dolphins. The old south pier and old approach pier demolition would begin after the new south pier is operational (MNB 2011d). The temporary mooring dolphin near the north pier would also be demolished at this time, and the debris would be recycled along with the south pier demolition debris. This phase would require two barge-mounted cranes to expedite the demolition of the existing pier. The other equipment used would be the same as Phase 1 (MNB 2011d).

Turning Basin Dredging. Dredging for the turning basin could occur any time before, during, or shortly after the construction process (MNB 2011d). There would be no dredging during the least tern breeding season, 1 April to 15 September. There is no specific intent for the Navy MMP to remain at its existing location during the dredging phase. However, under Alternative 1, should dredging take place separately from the pier replacement effort (i.e., either before or after construction and demolition), the Navy MMP could occupy its current location if the assumptions listed in Section 2.2.2 are met (NAVFAC Southwest 2011h). A description of dredging equipment and timing is listed in Section 2.2.1.5.

2.2.1.3 Phased Construction of a Replacement Fuel Pier

During development of the new pier design, several measures were adopted to minimize impacts to eelgrass near the existing fuel pier. These measures include: pier alignment positioned to minimize eelgrass disturbance, pier extended into deeper water to minimize dredging, existing sheet piling left in place to minimize sediment and eelgrass disturbance, and use of mooring dolphins to reduce the size of new pier footprint and minimize bay shading.

The approach segment of the new fuel pier from shore bayward would be 700 ft long as compared with 500 ft for the existing fuel pier. The new fuel pier north and south berthing segments would be 50 ft wide, the same as the existing pier. The approach segment would be constructed approximately 5 ft north of the existing pier to minimize disturbance to eelgrass and to facilitate connecting the pier with pipelines to onshore FLC Fuel Facility NBPL fuel storage facilities. The new north/south berthing segments would be angled allowing vessels to align more easily at the pier, compared to the "T" shape of the existing fuel pier (Figure 2-6). Due to the angled alignment, the new pier berthing segment north end would extend about 100 ft beyond the existing fuel pier, and the berthing segment south end would extend bayward about 300 ft beyond the existing fuel pier (MNB 2012c). However, as with the existing fuel pier, the new fuel pier would lie entirely within a USCG navigation Restricted Area.

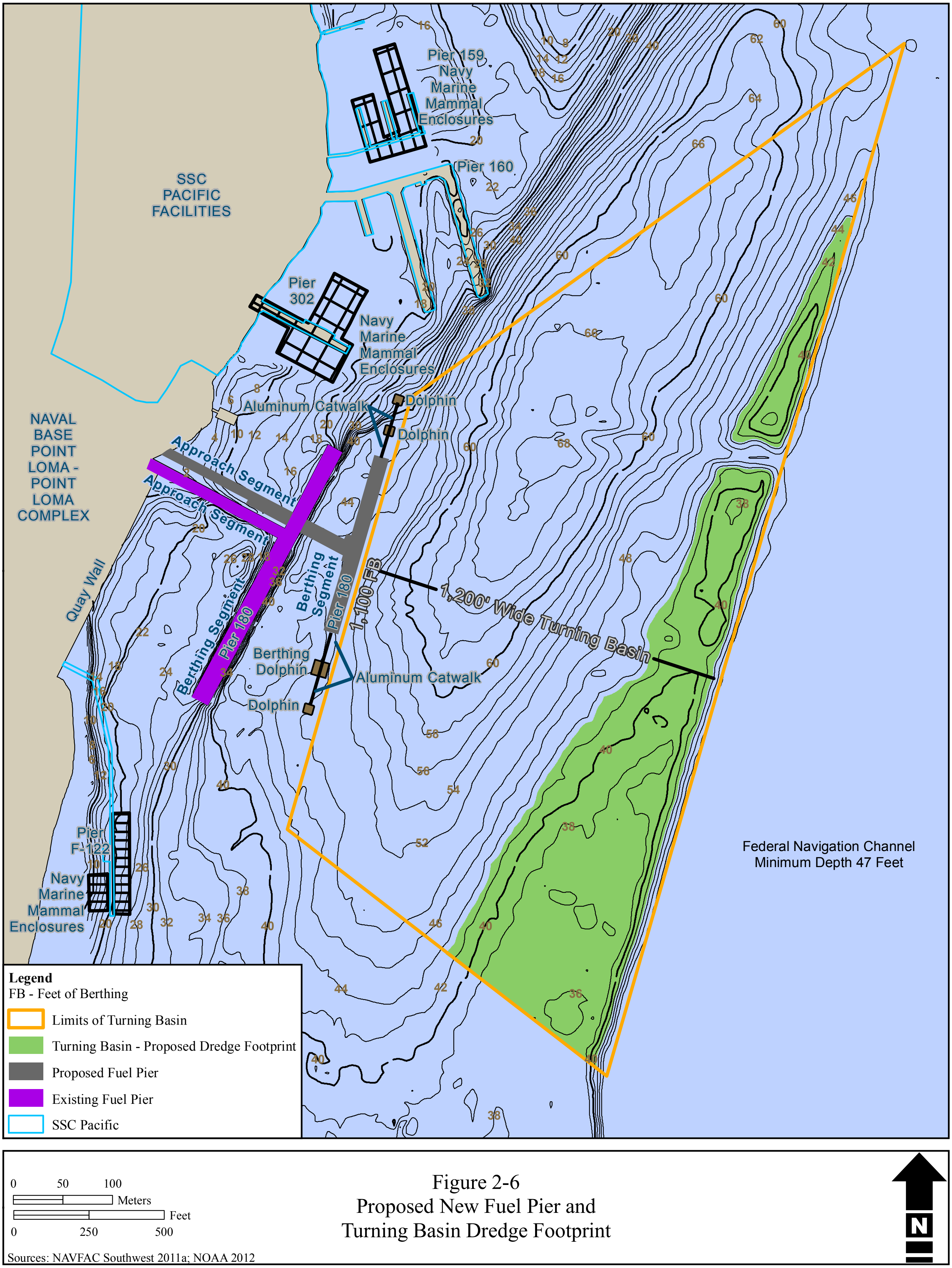


Figure 2-6
Proposed New Fuel Pier and
Turning Basin Dredge Footprint

Sources: NAVFAC Southwest 2011a; NOAA 2012

As discussed in Section 2.2.1.4, the Restricted Area would be amended to allow for the bayward additional length of the new pier and there would still be approximately 700 ft of open water available between the Restricted Area and the navigation channel for use by civilian vessels.

The new pier approach segment would connect to shore as a single deck with a ramp leading to the upper deck of the double deck berthing segment. The berthing segment would be 605 ft long by 50 ft wide, supplemented with three mooring dolphins and one berthing dolphin to extend berthing length to 1,100 ft. The added 200 ft of approach pier length places the berthing segment of the new pier in a deeper, previously dredged location where most of the area to be used by vessels approaching the pier already meets the minimum depth requirement of 40 ft (MNB 2012b). This placement would accommodate a wider variety of ships than is currently possible at the existing fuel pier where depths are 30 to 40 ft (see Figure 2-6). No dredging would be needed alongside the pier during construction, and the need for future maintenance dredging along the pier would be reduced or eliminated.

The top of the lower deck would be set at 13 ft MLLW, approximately 5 ft above extreme high tide. The new pier upper deck elevation would be 28 ft above MLLW and 20 ft above extreme high tide. The upper deck would have sufficient height needed for the pier fuel loading arms to safely reach fuel transfer points on the majority of larger ships (Navy 2010a) as described in Section 2.1. There would be a 3.5 ft-high concrete barrier around the upper deck perimeter, so the combined double deck structure would stand at 31.5 ft MLLW.

Table 2-6 lists the height of equipment that would be mounted on the proposed new fuel pier upper deck and approach segment.

Table 2-6. New Fuel Pier Above Deck Equipment Heights

Deck	*Feature Name*	*Feature Height (ft)*	*Number to be installed*	*Height of feature installed on pier (ft above MLLW)*[1]
Upper	Fuel Loading Arm	30	6 (4 on the outboard side of the pier and 2 on the inboard side)	58
Upper	Loading Station via Hose	5	6	33
Upper	Pole lighting[2]	25	7	56.75
Lower (Approach single level)[3]	Pipe rack	6	One rack supporting 11 pipes	19
Lower (Approach single level)	Pole lighting	25	6	29.25

Notes: [1] Lower pier deck elevation would be +13 ft MLLW; upper deck would be +28 ft MLLW.
[2] Pole lighting would be installed on top of the 3.75 ft-high barrier on the upper deck.
[3] Pole lighting would be installed on top of the 1.25 ft-high barrier on the lower deck.
Sources: Burns and McDonnell 2012a, NAVFAC Southwest 2011e.

The 1,100 ft berthing length was chosen to provide flexibility in fueling multiple types of vessels at the proposed new fuel pier, including the T-AKR that requires the 1,100 ft berthing length (MNB 2012b). The inner berths provide two additional berthing areas, the south and north inner berths. The south inner berth would accommodate vessels up to 500 ft long and the north inner berth would provide a small craft berthing area for vessels up to 400 ft long. The existing fuel pier total area is 71,180 sf/1.63 ac. The total area of the new pier (including the 700 ft long approach segment and dolphins) would be 65,865 sf/1.51 ac (MNB 2012b). This would be a decrease of 5,315 sf/0.12 ac of bay shading compared to the area of the existing fuel pier (MNB 2012b).

The replacement pier structure, including the mooring dolphins, would consist of steel pipe piles, supporting concrete pile caps and cast-in-place concrete deck slabs. Concrete material may be delivered from either trucks or barges (MNB 2012b). The upper 10 ft of the steel wall pipe piles of the lower deck would be filled with concrete as part of the connection between the piles and the lower pier deck. Approximately 554 total piles would be installed (MNB 2012b). Concrete pilings are not suitable to support the double-deck pier due to the structural seismic forces, so steel structural pilings would be used (MNB 2012b). Design of the fuel pier takes into account seismic loading, vessel loading, gravity loads, and functionality of the overall system. The State of California enforces special requirements for marine oil terminals, particularly with regard to seismic criteria, and the Navy has agreed to comply with the California marine oil terminal requirements for this facility. The design of the piles is governed by loading conditions that include seismic loads (MNB 2011f). The structural analysis performed has determined that concrete piles of sizes available in southern California cannot develop sufficient strength and stiffness to withstand the design loads considering the water depth at the site, the geotechnical conditions, and with the deflection limitations needed for the fuel operations (MNB 2011f). The sizes of the steel piles are dependent on water depth, subsurface soil conditions, and the mass of the deck structure. In most areas, a 36-in diameter steel pile is adequate to meet the criteria (MNB 2011f). In other areas, a 48-in diameter pile is necessary (MNB 2011f).

The new steel piles would be protected from seawater corrosion with a combination of coating and cathodic protection systems with anodes (aluminum) that would require replacement approximately every 20 years (Burns and McDonnell 2012b). The existing sheet pile system would continue to be protected from corrosion with its existing (protected/reconnected) impressed current cathodic protection system (Burns and McDonnell 2012b). The service life of the entire pier structure would be 75 years (Burns and McDonnell 2012b).

Table 2-7 lists the types and numbers of pilings to be installed. The project construction schedule limits pile driving to four "windows" of opportunity that would occur in Phase 1 and Phase 2. There would be no pile driving or other in-water construction or demolition during the least tern breeding season, from 1 April through 15 September of each year that the project is ongoing. Due to these restrictions on in-water construction, pile driving could take up to 3 years to complete.

Table 2-7. Proposed Replacement Fuel Pier Pilings to Be Installed

Pile Type	*Number*
48-in diameter x 1-in steel wall pipe piles	77
36-in diameter x 1-in steel wall pipe piles	228
24-in diameter x 1-in prestressed concrete piles	165
16-in diameter concrete-filled fiberglass piles	84
Total	**554**

Source: MNB 2012b.

It is assumed that the contractor would drive approximately two steel piles per day, and five concrete or fiberglass piles per day. Each pile is assumed to require up to 2 hours of driving. Steel piles would be driven initially with a vibratory pile driver, and then finished as necessary with an impact pile driver. Working assumptions are 1-1.5 hours of vibratory pile driving and up to 0.5 hour of impact pile driving for each steel pile. Concrete piles would be jetted and then driven with an impact pile driver only. The fiberglass fender piles do not need to be embedded as deeply into the subsurface as the steel wall and concrete structural piles, so they would be driven with the impact hammer for the entire length (MNB 2012b). The fender system for the pier would include foam-filled fenders at the berths and plastic log camels.

The currently proposed construction schedule includes the following non-overlapping, consecutive episodes of pile driving within the first year:

- Relocation of 32 existing and installation of 46 new concrete guide piles to support the relocated facilities of the Navy MMP to NMAWC. Pile driving is estimated to occur over an 8-week period.
- Installation of steel indicator piles to occur over 17 days.
- Installation of steel temporary dolphin piles to occur over 5 days.
- Installation of 24 steel abutment piles to occur over 13 days.
- Installation of approximately 26 steel structural piles over 15 days.

During the second year of construction there would be several non-overlapping episodes of pile driving, including:

- Steel structural piles for the access pier, 45 days.
- Fiberglass-concrete secondary fender piles for the access pier, 10 days. This would occur in the same timeframe as concrete pile driving (below).
- Steel structural piles, 45 days.
- Steel mooring dolphin piles, 12 days.
- Concrete primary fender piles, 15 days.

During the third year of construction there would be several episodes of pile driving, including:

- Concrete primary fender piles, 15 days.
- Fiberglass-concrete secondary fender piles, 12 days.
- Steel mooring dolphin piles, 12 days.
- Steel abutment piles, 10 days.

The abutment piles and mooring dolphin piles would be driven within the same timeframe, over a combined 12-day period.

Figure 2-7 provides an artist rendering of the proposed new fuel pier when completed.

Figure 2-7
View of Proposed New Fuel Pier

The contract specifications would provide construction work day restrictions that are consistent with City of San Diego construction noise ordinances (MNB 2012b). Pile driving would occur during normal working hours (7:00 A.M. to 4:00 P.M. on weekdays) (MNB 2012b).

Aluminum catwalks would connect the berthing and mooring dolphins to the main pier (see Figure 2-6). The approach segment would be of similar construction to the berthing pier. The main pier decks would be designed for a 50 ton mobile crane, 20 ton truck load, and 10 ton forklifts (5 ton forklift on the lower deck); heavy equipment would not be operated on the berthing or mooring dolphins (MNB 2012b).

There would be fueling stations on the upper and lower decks of the new fuel pier berthing segment. Each fueling station would have the capability to supply diesel fuel marine (DFM) and JP-5 turbine (jet) fuel to vessels. The upper deck would be used for offloading fuel from tankers to the tank farm and for supplying fuel to higher profile vessels. The lower deck would be used for fueling smaller profile vessels. Table 2-8 lists the fueling stations on the two decks of the berthing segment of the new fuel pier.

Table 2-8. New Pier Fueling Stations

Deck	*Side*	*Product*	*Number of Stations*
Upper	Outboard	Fuel	4
Upper	Outboard	Lube Oil	2
Upper	Inboard	Fuel	4
Upper	Inboard	Lube Oil	1
Lower	Outboard	Fuel	4
Lower	Outboard	Lube Oil	1
Lower	Inboard	Fuel	3
Lower	Inboard	Lube Oil	0

Source: NAVFAC Southwest 2011e.

The upper deck would also have six piping connections to receive ballast water from fleet tankers and other larger ships (Burns and McDonnell 2012b). An 8-in diameter oily water pipe would be used to transfer the ballast water to the NBPL FOR facility. The ships could either pump directly to the oily water receipt tank at the treatment system or transfer to the smaller collection tank located on the pier (Burns and McDonnell 2012b). A pump at the collection tank would then transfer the oily water to the receipt tank at the treatment system (Burns and McDonnell 2012b).

Pier deck design is such that all rainfall accumulating on the lower deck, as well as rainfall from the 85th percentile storm event accumulating on the upper deck of the new pier, would be collected on the pier and sent to the FOR receipt tank for treatment. The upper deck would be equipped with underflow scuppers that would permit a portion of the runoff from greater than the 85th percentile storm events to discharge to the bay. The underflow design would prevent surface sheen and floating fuel from being discharged to the bay and also allow the "first flush" to be sent to the FOR Receipt Tank in such storms.

The pier operations would be supported by two pipelines for each fuel product and two for lube oil. There would be a 16-in and an 8-in pipeline for loading/unloading JP-5. For loading and unloading DFM, there would be a 16-in and a 10-in pipeline. There would be two 6-in pipelines for loading lube oil. The 16-in pipes would support the fueling stations on the outboard side while the 8-in JP-5 and 10-in DFM pipes would support the fueling stations on the inboard side.

The 50 ft top-of-deck width is the minimum requirement for a fuel pier per DoD UFC. The new fuel pier would provide adequate deck space on the berthing segment by using a double deck structure to separate the fuel lines from operations on the berthing segment and provide containment for fuel pipelines and utilities. On the berthing segment, the pipelines and utilities would be hung beneath the upper deck. Utilities would be in a dedicated vault separate from the pipelines. On the approach segment, fuel lines would be stacked in pipe racks running along one side of the lower deck. Where the approach and berthing segments meet, the fuel lines' orientation would transition from horizontal along the lower deck to vertical to reach the upper deck, then horizontal again beneath the upper deck (NAVFAC Southwest 2011e).

Concrete containment curbs would be incorporated into the pier deck design surrounding all fueling arms, fueling risers, and fuel pipes. There would be sumps in curbed containment areas in both pier decks to capture spilled fuel as well as rain water. Sumps located in the upper deck would be fitted with drains that would be piped to a collection tank on the lower deck. Sumps in the lower deck would connect to the FOR. There would be a 1.25-ft-high concrete curb around the perimeter of the lower deck and 3.75-ft-high concrete barrier around the upper deck.

The total fuel volume of the new pier pipelines would be 49,000 gallons, an increase of 22,960 gallons (approximately 88 percent) from the existing pipeline capacity of 26,040 (Burns and McDonnell 2012c). The dual piping configuration would allow fueling operations to take place on both sides of the pier simultaneously, and include a cross-over capability so that fuel could be transferred from one side of the pier to the other should one side shut down temporarily (MNB 2010).

The following would all be upland work. An existing underground trench containing piping from the onshore fuel storage facilities would be extended to the pipelines on the new pier. The connection for the new pipelines would be located between 35 and 65 ft from the existing pier abutment. With the exception of some electrical duct bank work, shoreside excavation would take place near the abutments of the existing pier and the proposed new pier. In addition to the fuel pipelines, a 12-in diameter fire suppression water line would be installed on the proposed pier and connected to the onshore potable water supply system (Burns and McDonnell 2012c).

The total disturbed area on shore would be less than 1 ac, comprising previously disturbed areas that are paved and unpaved. The paved area northwest of the existing fuel pier would be excavated (an area approximately 20 ft long, 6 ft wide, to a depth of about 5 ft) to extend the underground pipeline trench to the new pier and to install underground utilities and subsequently re-paved. The existing 12-in diameter stormwater outfall located immediately north of the existing fuel pier abutment would be relocated to the north side of the new pier abutment. A portion of the landscaped area between the existing fuel pier and lube oil storage tanks would be paved as part of the new pier landside abutment. Three palm trees would be removed from the landscaped area. A new security fence with a motorized gate would be constructed at the entrance to the new pier.

After the new pier is completed, the quay wall at the entrance to the old fuel pier would be rebuilt. This work would include the placement of approximately 100 cy of concrete to repair the quay wall (MNB 2011g). There would also be some grading and asphalt repairs in this area (MNB 2011g). Repairs to the quay wall would also include removal of two closed underground storage tanks (USTs) (Tanks 115A and 115B; see Section 3.7.2.7) (Burns and McDonnell 2012b).

The connection between the new and old pier abutments would be constructed by placing closely-spaced 48-in diameter steel pipe piles along the base of the new and existing bulkhead. The gaps between the piles would be closed by welding steel "wings" between the piles. A concrete cap would be placed at the top of the piles to support the new pier approach and provide a continuous surface. All the work would be performed above mean higher high water.

2.2.1.4 Regulated Navigation Zones

The approach segment of the new fuel pier from shore bayward (east) would be 700 ft long as compared with 500 ft for the existing fuel pier. The new pier berthing segment north end would be about 100 ft further east into San Diego Bay than the existing fuel pier, and the south end would be about 300 ft further bayward (MNB 2012c). While the new pier would not extend beyond the existing Security Zone east of the pier, there would not be sufficient distance between the new pier headline and the Security Zone boundary. The Navy Anti-Terrorism/Force Protection-required Security Zone for the fuel pier is 500 ft (Navy 2012c). The Navy has coordinated with the USCG to amend the Security Zone east of the pier by 250 ft (200 ft for the additional approach length and 50 ft for the berthing pier width) to provide an adequate Security Zone of 500 ft for the proposed new fuel pier alignment. The new pier would also extend beyond Navy waters into waters that are under the jurisdiction of the CSLC. Following completion of the National Environmental Policy Act (NEPA) process, Navy counsel would provide written notification to CSLC of the extension of Navy facilities into state waters (NAVFAC Southwest 2010). Regulated Navigation Zones in the vicinity of the fuel pier are shown in Figures 2-8a and 2-8b.

The distance from the new pier headline to the navigation channel would be 1,200 ft (the same width as the proposed turning basin). The proposed amended Security Zone would be 500 ft wide, leaving approximately 700 ft of open water between the Security Zone and the navigation channel for civilian vessels.

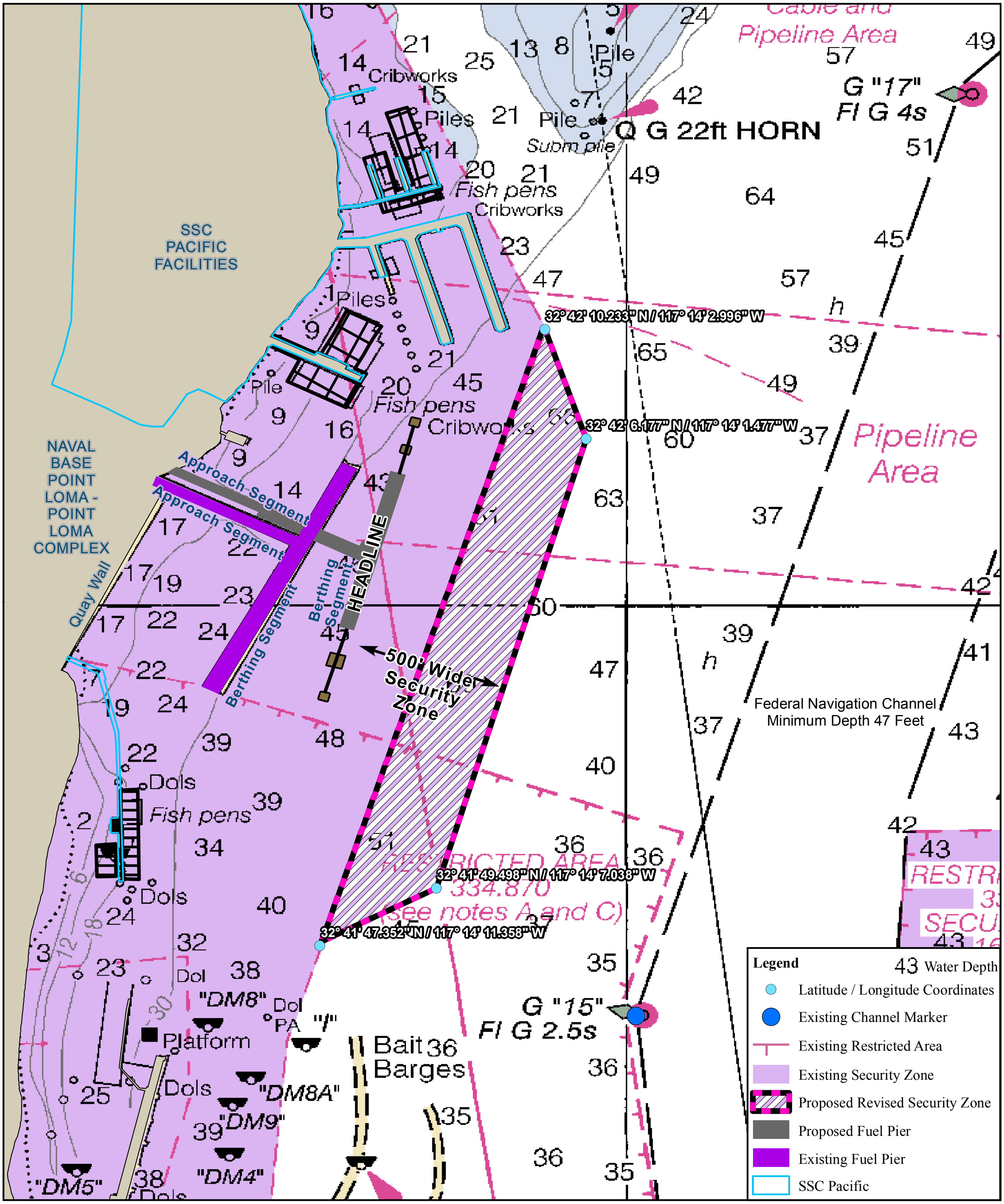


Figure 2-8a
Regulated Navigation Zones
NOAA Navigation Chart

Sources: NAVFAC Southwest 2011a; Navy 2012b; NOAA Chart 18773 San Diego (NOAA 2012)

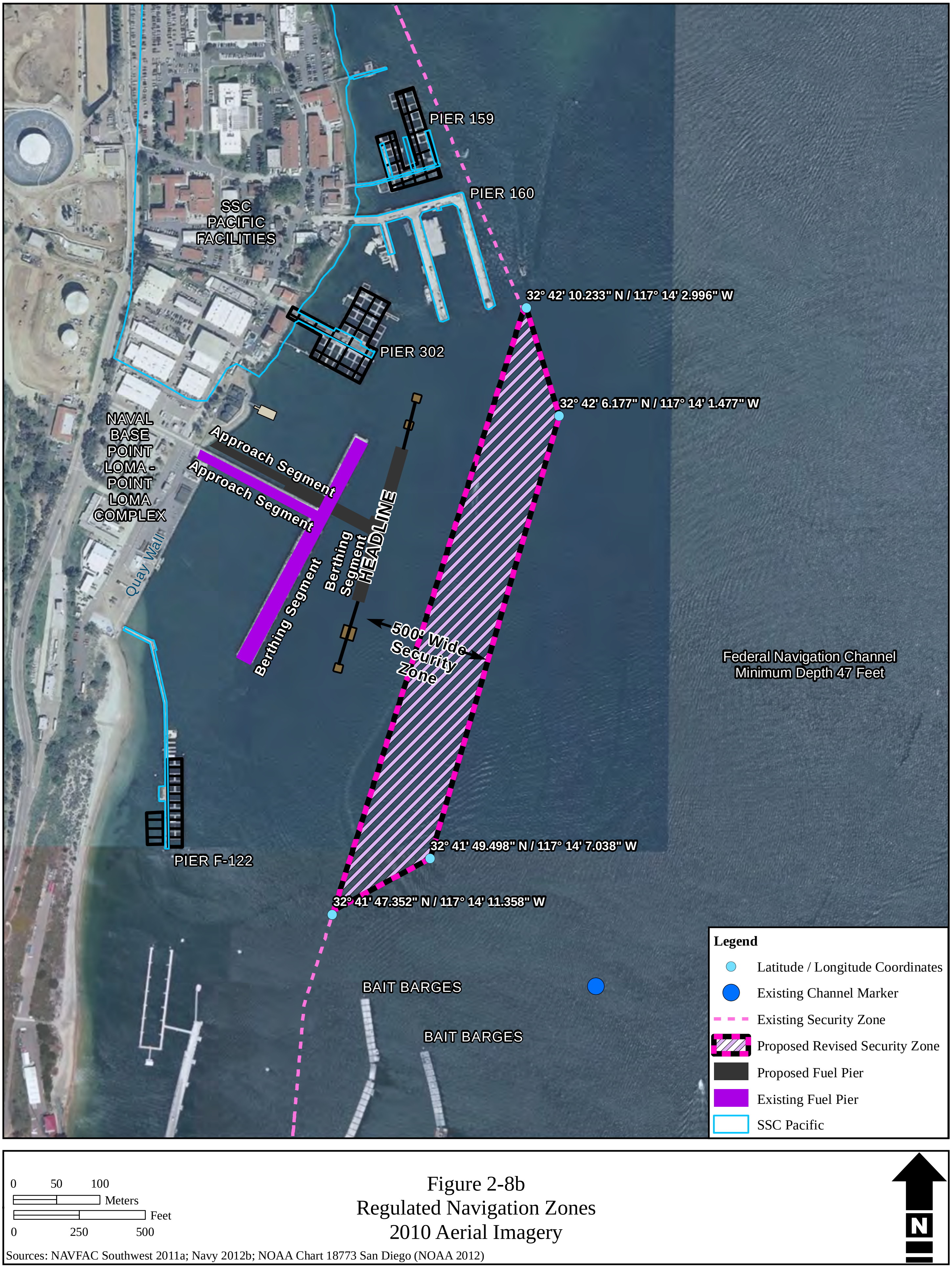


Figure 2-8b
Regulated Navigation Zones
2010 Aerial Imagery

Sources: NAVFAC Southwest 2011a; Navy 2012b; NOAA Chart 18773 San Diego (NOAA 2012)

The Navy would also coordinate with the USCG to establish a temporary Security Zone that would extend 100 ft bayward from the temporary Navy marine mammal facilities to ensure civilian craft do not interfere with restricted maneuverability of Navy small boats operating within the immediate vicinity of Navy marine mammal enclosures (SSC Pacific 2012). Signs would be posted alerting vessels that entry into the temporary Security Zone is prohibited without permission of the Captain of the Port. There would be approximately 358 ft of open water for civilian boat traffic to navigate between the proposed temporary Security Zone and the dock facilities on west Harbor Island, and about 480 ft of open water between the temporary Security Zone and the western end of Harbor Island (Figures 2-9a and 2-9b). The temporary Security Zone would be removed when the Navy MMP has returned to its existing location. The U.S. Coast Guard (USCG) is processing an amended security zone for NBPL and a new temporary security zone for NMAWC.

2.2.1.5 Dredging and Sediment Disposal

Vessel traffic moves in and out of San Diego Bay via the federal channel that is maintained at a depth of -47 ft MLLW by the USACE (Figure 2-6) (National Oceanic and Atmospheric Administration [NOAA] 2012). Large vessels approaching the fuel pier in the channel from the south (inbound) require an area of open water with sufficient depth, known as a turning basin, to safely align at the pier. The proposed new pier layout would include a minimum 1,200 ft wide turning basin between the outboard (eastern) side of the pier and the navigation channel, to provide safety for the berthing operations of the large vessels being serviced at the facility. The north and south limits of the turning basin would be bounded by the existing channel markers located to the northeast and southeast of the fuel pier. The design depth for the turning basin would be -40 ft MLLW (38 ft vessel draft plus 2 ft under keel). An additional 2 ft of dredge depth would be included as overdredge allowance, or tolerance that could vary depending on the precision of the dredging contractors' equipment and methods. Thus, the maximum project dredge depth would be -42 ft MLLW, but the entire overdredge volume might not be recovered if the contractor is able to excavate to 40 ft with less than 2 ft of tolerance.

The majority of the existing bathymetry is deep enough to accommodate safe vessel operation. However, there is a wedge-shaped high spot about 1,200 ft east of the existing fuel pier where bottom depths rise from -40 to -36 ft MLLW (see Figure 2-6). This wedge-shaped area (approximately 463,000 sf/10.6 ac) would need to be excavated to bring it to a minimum of -40 ft MLLW. The proposed dredge footprint would be located approximately 700 ft east of the new fuel pier, as illustrated in Figure 2-6. The dredge footprint would be limited to the area shown in green on Figure 2-6.

The estimated volume of dredging required is shown in Table 2-9.

Table 2-9. Proposed Dredging Volume

Site	*Design Depth (-40 ft MLLW)*	*Overdredge (2 ft)*	*Total*
Turning Basin	40,000 cy	40,000 cy	80,000 cy

Note: cy = cubic yards
Source: MNB 2012b.

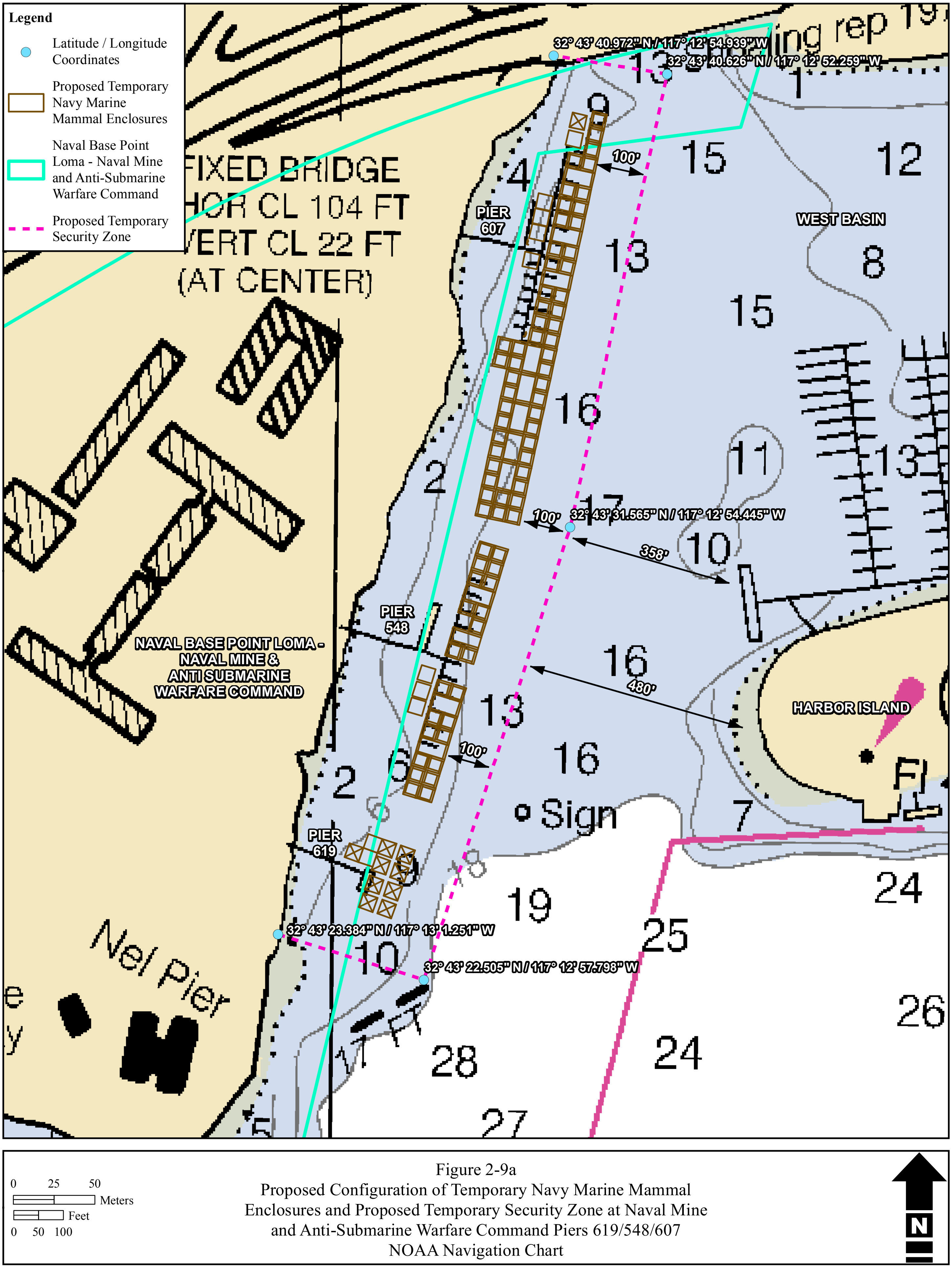
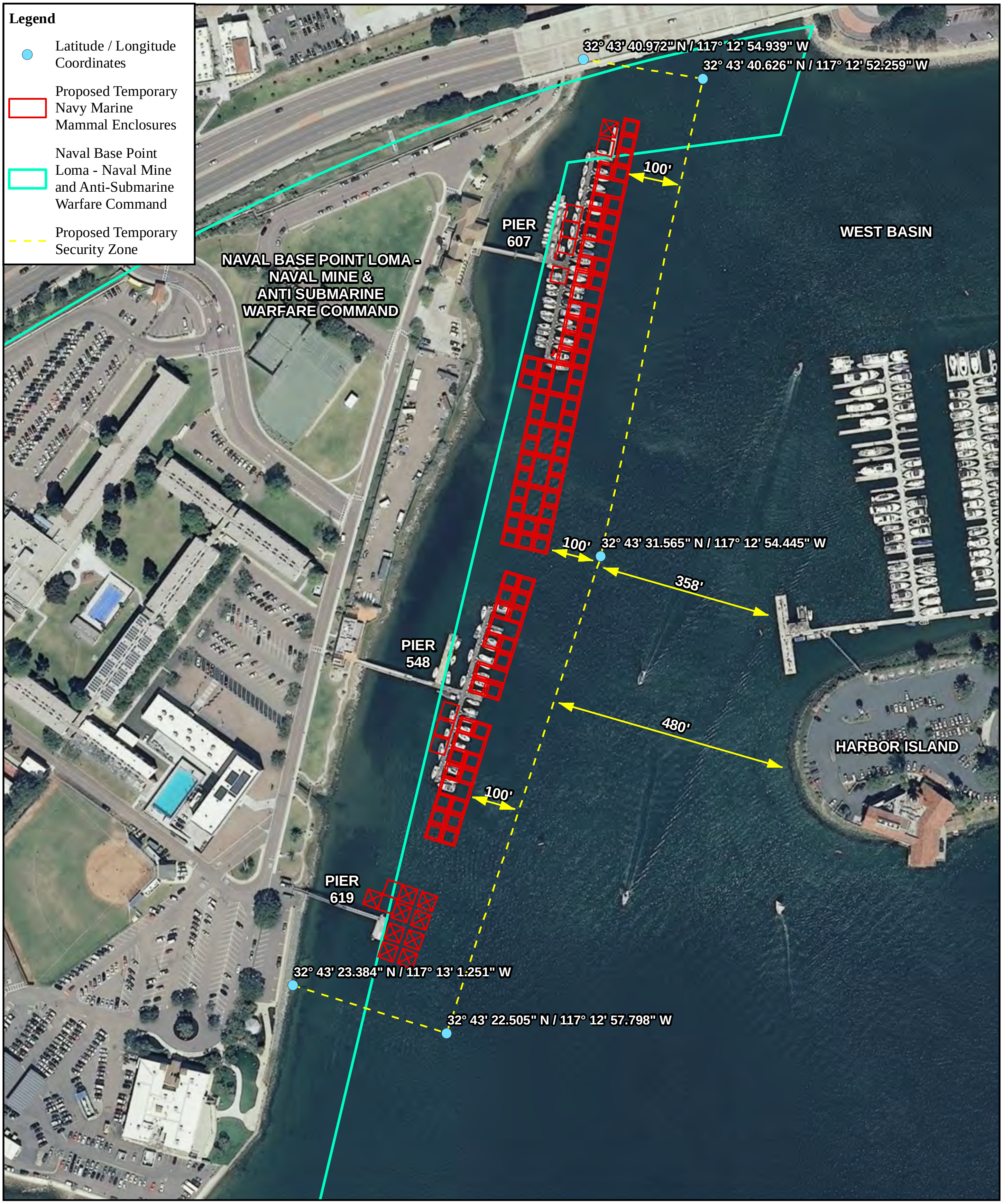


Figure 2-9a
Proposed Configuration of Temporary Navy Marine Mammal Enclosures and Proposed Temporary Security Zone at Naval Mine and Anti-Submarine Warfare Command Piers 619/548/607
NOAA Navigation Chart



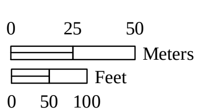


Figure 2-9b
Proposed Configuration of Temporary Navy Marine Mammal Enclosures and Proposed Temporary Security Zone at Naval Mine and Anti-Submarine Warfare Command Piers 619/548/607
2010 Aerial Imagery

As stated above in Section 2.2.1.2, underwater pipelines that supply jet fuel to NAS North Island are in the project area. The Navy would work with contractors to establish a safety buffer zone between the pipelines and the dredge footprint and would ensure that all contractors' vessels and equipment remain outside the buffer zone during dredging operations.

Sediment samples from the dredge footprint were collected in November 2010 and tested in accordance with regulations contained in Title 40 CFR Parts 220-228. The sediment characterization report is included as Appendix D of this EA. The full laboratory results, including method detection limits for the sediment analyses are available for review at the NBPL Public Affairs Office. The sediment characterization report was provided to USEPA and USACE for review and comment on potential sediment disposal options. The agencies determined that the dredged material is suitable for unconfined aquatic disposal (refer to Appendix A) (USEPA 2011).

Depending on availability, a hopper (hydraulic) dredge or a medium size, 8-12 cy bucket, barge-mounted clamshell dredge could be used (MNB 2012d, Navy 2010f). If a clamshell dredge is used, the specific make and model of the bucket would be determined by the selected contractor and permit conditions.

The Draft EA evaluated the nearshore zone at Imperial Beach as the proposed location for beneficial reuse of dredged sediments from the Proposed Action. In the interval between the Draft and the Final EA, the decision was made to reuse dredged sediments instead in the nearshore zone at Silver Strand Training Complex (SSTC) at NAB Coronado (Figure 2-10).

Sediment sampling transects were deployed by divers at the STCC receiver site. Three paired samples were collected from the surficial sediments (top 6-in.) at the STCC nearshore area. Sample locations were equally spaced along the sampling transect in 20-m intervals with two separate samples collected. Sediment samples were transferred with a completed chain of custody to Calscience Environmental Laboratories in Garden Grove, CA for geotechnical analysis using the EPA approved laser diffraction method.

The reconnaissance level survey results indicate that on a geotechnical basis, the dredged material and potential receiver site grain sizes are compatible (Table 2-10). Average grain size for all samples tested for the STCC site was 0.182 millimeter compared with 0.250 millimeter at the Pier 180 site. In addition, the greater than 80 percent coarse grain size fractions found within the dredged material samples (86.5 percent for pier 180 composite areas), further suggests that this material is suitable for nearshore disposal. The Navy believes the data collected is of sufficient resolution to facilitate regulatory review for a suitability determination of Pier 180 sediments for beneficial reuse at the STCC area. USEPA and USACE expressed support for the Navy's updated P-151 dredged material beneficial reuse proposal (refer to Appendix A). NMFS found that the STCC site is acceptable for beneficial reuse of the project dredge sediments (refer to Appendix A).

Similar to Imperial Beach, the SSTC beach has become eroded due loss of sand from natural sources (Navy 2011). The SSTC beach is one of four coastal segments recommended and approved for sediment replenishment (San Diego Association of Governments [SANDAG] 2009, USACE 2012). The USACE brought dredge sediments from its San Diego Harbor Maintenance

Dredging Project to an adjacent section of the SSTC nearshore zone (USACE 2012, NAVFAC Southwest 2013). The proposed sediment beneficial reuse area is approximately 1,200 ft offshore, contained within NAB Coronado SSTC Boat Lanes 8 and 9 (Figure 2-10). The detailed protocol used in the previous USACE channel dredge project would be followed to ensure that dredge disposal operations from the Proposed Action do not interfere with training operations.

If a clamshell dredge is used, dredge material would be loaded into a 5,000-10,000 cy capacity barge and transported to the nearshore beneficial reuse site at the SSTC beach, where it would be placed in the nearshore zone (MNB 2012b). Two barges would likely be used in rotation to allow uninterrupted dredging. Alternately, if a hopper dredge is used, the dredge material would be stored within the dredge vessel, which would periodically travel to the beneficial reuse site at SSTC and discharge the sediment. One tug would assist each dredge vessel and barge.

Table 2-10 compares the sediments at the proposed dredge and beneficial reuse sites.

Dredging would halt temporarily while the hopper dredge is en route to and from the beneficial use site. Daily dredge production, including transport and placement at the beneficial reuse site can be assumed to be 2,000-4,000 cy. Maintaining an average production rate of 2,000 cy per day would enable up to 80,000 cy of material dredged from the turning basin to be dredged and placed at the beneficial reuse site in approximately 3 months (Navy 2010f). Dredging and beneficial reuse for nearshore replenishment of dredged materials would comply with USACE requirements for dredging and sediment disposal. The sediment in the proposed dredging area is classified as fine sand; as such it is similar to sediments at the beneficial reuse site at SSTC (Tierra Data, Inc. [TDI] 2012a).

2.2.1.6 Temporary Relocation of Everingham Brothers Bait Company Bait Barges

The two Everingham Brothers Bait Company San Diego Bay bait barges are anchored on Navy property about 1,800 ft south of the existing fuel pier and are oriented side-by-side (Figure 1-2). The Everingham Brothers Bait Company would need to move the bait barges before pile driving activities begin; this would accompany the Navy fuel pier replacement project but is not an element of the proposed project as such. Relocating the bait barges outside of the zone of influence (ZOI) for pile driving noise would reduce the exposure of wild marine mammals to sound levels above thresholds for injury and behavioral disturbance (Levels A and B thresholds, respectively). In addition, moving the bait barges would help avoid potential damage to the commercial bait fish that are important to the local fishing industry. This section discusses the bait barges, their operations, and proposed temporary relocation sites for the barges (Figure 2-2). The bait barges would anchor at the temporary site during the portion of the year that least terns do not forage (September 16 through March 29) while project activities are ongoing.

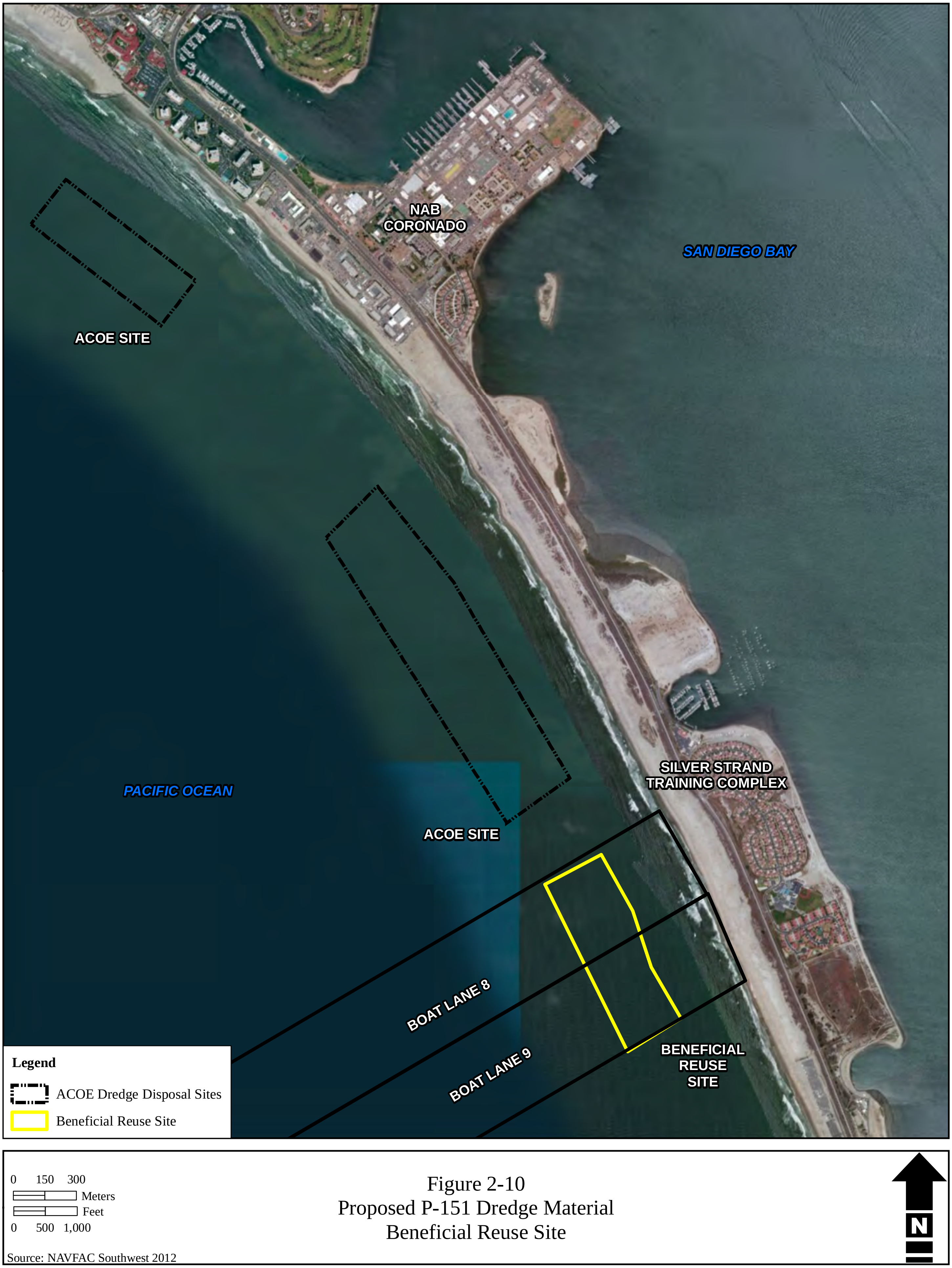


Figure 2-10
Proposed P-151 Dredge Material
Beneficial Reuse Site

Source: NAVFAC Southwest 2012

Table 2-10. Sediment Distribution Comparison, Proposed NBPL Dredging and Beneficial Reuse Areas

Site Location	*Sample Number*	*Units*	*Sediment Sizes*									*Total Silt + Clay*	*Mean Grain Size (mm)*	*Sample Description*
			Gravel	*Very Coarse Sand*	*Coarse Sand*	*Medium Sand*	*Fine Sand*	*Very Fine Sand*	*Total Sand*	*Silt*	*Clay*			
SSTC Beneficial Reuse Area	NBC-3-1	%	0	0.2	3.46	9.41	49.78	32.29	95.14	3.94	0.93	4.87	0.175	Fine Sand
	NBC-3-2	%	0	0.26	4.24	10.9	43.2	33.9	92.5	6.51	1	7.51	0.177	Fine Sand
	NBC-3-3	%	0	0.29	2.86	8.62	46.33	35.42	93.52	5.47	1.01	6.48	0.166	Fine Sand
	NBC-3-4	%	0	0.26	3.48	11.7	60.08	21.19	96.71	2.44	0.85	3.29	0.191	Fine Sand
	NBC-3-5	%	0	0.18	3.18	12.29	60.55	20.68	96.88	2.28	0.84	3.12	0.190	Fine Sand
	NBC-3-6	%	0	0.1	3.11	12.4	61.3	19.9	96.81	2.33	0.86	3.19	0.190	Fine Sand
Proposed NBPL Dredge Footprint	Area 1	%	0.03	2.38	5.95	30.18	41.55	6.75	86.81	10.54	2.62	13.2	0.220	Fine Sand
	Area 2	%	0.24	8.23	19.2	33.97	18.55	6.72	86.67	10.41	2.69	13.1	0.320	Medium Sand

Source: Tierra Data, Inc. (TDI) 2012a.

Each bait barge primarily consists of two rows of large wooden compartments tied together, called "receivers." One barge is equipped with a single-story shelter for personnel and equipment (Everingham Brothers Bait Company 2012). California sea lions and several species of seabirds frequently rest on top of the bait barges.

The wooden receivers hold live bait fish in underwater cages. Each of the 102 receivers is 28 ft long, 14 ft wide, and 12 ft high, although the lower 10 to 11 ft remain under water. At present, the western bait barge measures approximately 750 ft from buoy to buoy and 1,045 ft from mooring to mooring; the eastern bait barge is about 630 ft from buoy to buoy and 930 ft from mooring to mooring. The barges have several location requirements, including:

- Bait fish require a maximum water temperature of 70 degrees Fahrenheit and a linear current flow to maintain sufficient oxygen levels in the cages.
- The barges must be located away from the strong winds and waves outside the bay to prevent damage.
- Water depth must be in the range of 35 ft below MLLW so that there is sufficient clearance between the bottom of the 11 ft-high receivers and the bay bottom that movements of swells at high and low tides do not push the receivers onto the bay bottom and break them.
- A minimum distance of 460 ft to shallow water is necessary to prevent the barges from being damaged by hitting the sea floor when moved by winds or currents.
- A minimum distance of 460 ft of open water is needed between the two barges to allow customer and Everingham Brothers Bait Company vessels adequate space to safely maneuver to and access the barge's compartments. Customers must be able to access both sides of both barges.

Due to the year-round demand for live bait fish in San Diego Bay, the bait barges operate 24 hours per day, 7 days per week, throughout the year to provide live bait for their customers (Everingham Brothers Bait Company 2012).

Depending on the size of the barge, a 3,000-or 5,000-pound anchor is used. An anchor is dropped into the water at each end of the barge, a total of four anchors for the two barges. The anchor is shackled to one end of a 1.5-inch thick chain. The other end of the chain is shackled to a buoy ball that is attached to the barge with a cable. The chain is very heavy, so it drops to the bottom within a few feet of the barge. The chain is about 80 feet long, so the distance between the barge and the anchor is about 70 ft, accounting for the water depth.

Repair and maintenance of the wooden receivers that support the bait cages is a critical component of the bait barge operations for two reasons: a) because the wooden receivers do not last more than 2 years in the marine environment; and b) nearly all the boxes must be continually in use to provide enough bait to meet customers' needs. Therefore, receivers are repaired one by one, year-round. The receivers must be removed from the water for repair and were serviced onshore until the 1990s when the Port of San Diego and Mission Bay Parks terminated the company's leases for the onshore repair areas (Everingham Brothers Bait Company 2012). Since then the company has used its own maintenance barge that operates alongside the two bait barges. The crane on the maintenance barge hauls each box on the maintenance barge's deck for inspection. Sections needing repair are cut out, replaced with new wood, and repainted with vinyl antifouling paint; the receiver is then returned to its place in the bait barge. Each receiver takes 4 days to repair onsite. In a typical year without any additional storm damage to the barges, the company's dedicated four-person repair crew works 200 days, often 6 days, occasionally 7 days per week in two shifts, to keep the barges functional (Everingham Brothers Bait Company 2012). The ongoing, onsite unit-by-unit maintenance process is necessary and the added time, manpower, and cost to transport the receivers elsewhere for maintenance would be prohibitive (Everingham Brothers Bait Company 2012).

Based upon the operational requirements discussed above, multiple locations around San Diego Bay were considered as possible temporary relocation sites for the bait barges. Other factors also restrict the bay-wide potential site options, such as bird air strike hazards for aircraft at potential sites near airfields and the presence of eelgrass. Table 2-11 presents the potential bay-wide sites considered and the reasons why they were found to be unsuitable for temporary relocation of the bait barges. Figure 2-11 presents the locations of the potential bay-wide sites.

Table 2-11. Potential Bait Barge Bay-wide Temporary Relocation Areas Initially Considered

Initial Consideration	*General Location*	*Owner*	*Site Restrictions*
CSLC 1	East of Zuniga Jetty	CSLC	• Depth and swell issues.
CSLC 2	South of Ballast Point	CSLC	• Depth and swell issues.
NBC 3	NAS North Island (north)	Navy	• Bird air strike hazard for NAS North Island aircraft
NBC 4	NAS North Island (northeast)	Navy	• Bird air strike hazard for NAS North Island aircraft
NBPL 5	America's Cup Harbor, adjacent to NMAWC	Navy	• Eelgrass is present. • Ownership boundary issues.
SDUPD 6	*Harbor Island (southeast)*	*Port of San Diego*	• *No site restrictions. SDUPD 6 was carried forward for additional development, resulting in the options shown in Table 2-12.*
SDUPD 7	Harbor Island (central)	Port of San Diego	• Within the 120 dB Zone of Influence for underwater construction sound

Notes: CSLC = California State Lands Commission, NBC = Naval Base Coronado, NBPL = Naval Base Point Loma, SDUPD = San Diego Unified Port District, NAS = Naval Air Station, dB = Decibel, ZOI = Zone of Influence.

Source: NAVFAC Southwest 2012c; Everingham Brothers Bait Company 2012.

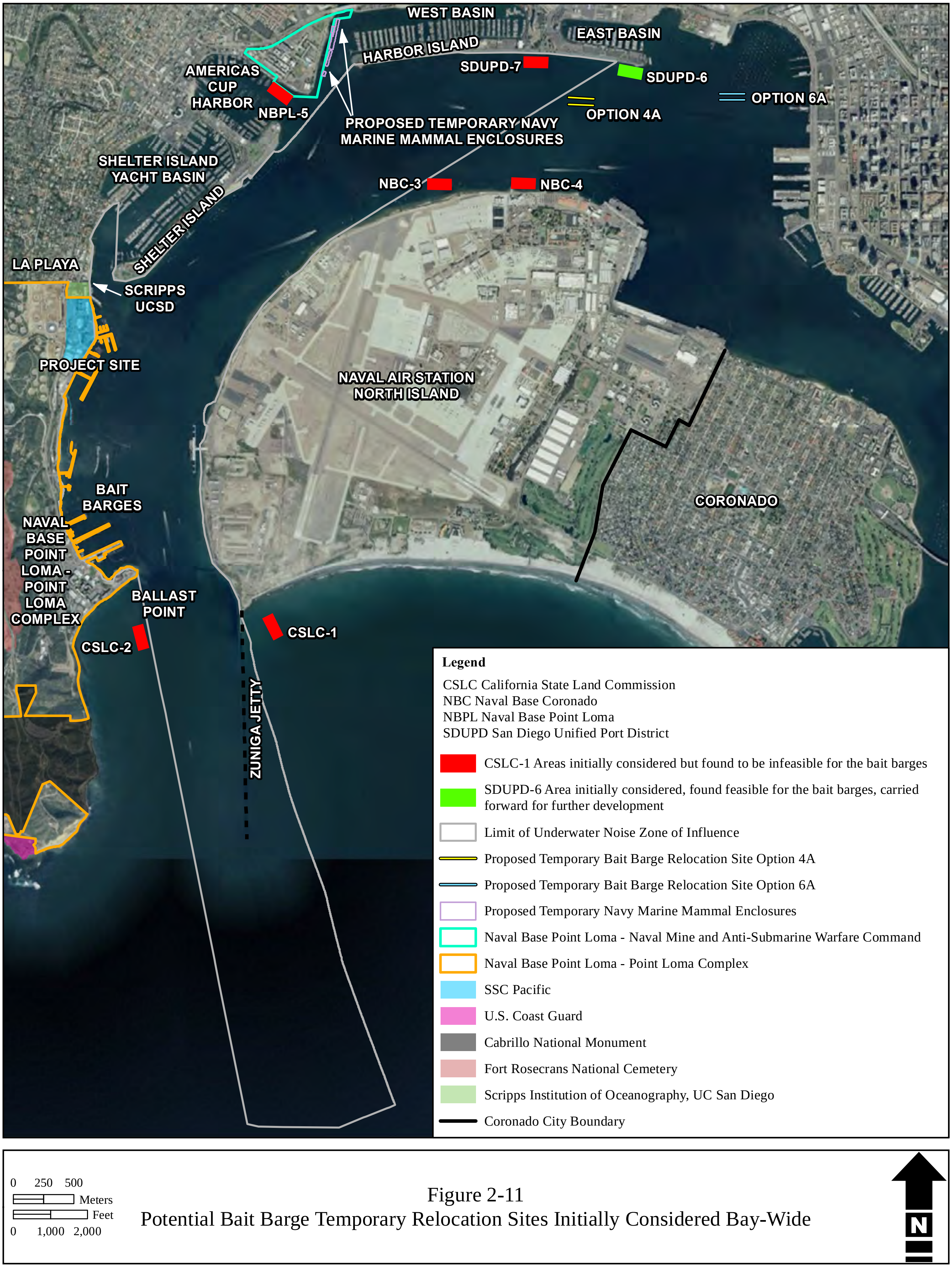


Figure 2-11
Potential Bait Barge Temporary Relocation Sites Initially Considered Bay-Wide

Of the seven bay-wide areas initially considered, only the area southeast of Harbor Island (Option San Diego Unified Port District [SDUPD] 6) was found to offer a range of water, wave, and depth conditions most likely to be suitable to the bait fish and bait barge operations in combination with safety for Navy aircraft operations. From the general area of initial consideration site SDUPD 6, seven site options around the southeastern end of Harbor Island were evaluated to determine the most feasible location to relocate the bait barges. Figure 2-12 and Table 2-12 present the eight Harbor Island sites initially proposed for relocating the bait barges. Options 4A and 6A on CSLC lands are the only sites being considered for temporary relocation of the bait barges (Figure 2-12). These two potential relocation sites have been approved by NRSW Port Operations (NRSW 2012). Following adoption of a FONSI for this project, the Everingham Brothers Bait Company and the CSLC would be expected to execute a lease for a temporary relocation site. Before moving the barges, the barge owners would deter sea lions from hauling out on the barges with sprinklers or other non-injurious methods, which is permissible under Section 109(h) of the MMPA and would not constitute harassment.

The two bait barge temporary relocation sites under consideration are very close to one another. As they are required to maintain the health of the bait fish and support bait barge operations, by definition they have the same physical conditions and surroundings. Therefore, for the purposes of analysis in this EA, it is assumed that temporary relocation of the bait barges would have the same impact(s) at either of the sites.

As described above in Section 2.2.1.2 under the subheading *Demolition/Construction Equipment and Phasing*, there would be no in-water demolition and construction during the least tern breeding season (1 April to 15 September). It is anticipated that it would be possible for the Everingham Brothers Bait Company to move the two bait barges back to their current position south of the fuel pier on approximately 1 April and return to the temporary relocation site by September 15 while project activities are ongoing. The current plan is for the Everingham Brothers Bait Company to return the barges to their existing site after the proposed new pier is constructed. In everyday operations, a skiff is used to tow the barges. A ¾"-thick nylon rope is tied to the corners of the barge and attached to the skiff. To move the barges from their existing location to the proposed temporary location, it is anticipated that the barges would be moved incrementally. Eight of the wooden bait compartments ("receivers") would be chained together and towed on a 75-foot long, 1.5"-thick line. The Everingham Brothers Bait Company seiner would be used as the tow vessel. At the temporary location, the first set of eight bait receivers would be anchored as described above, and additional sets of eight receivers would be towed, chained to the previous set(s) and anchored. When the bait barges are temporarily relocated during the fuel pier construction period, the barges' existing anchors will be left in place. The barges will use a different set of 4 anchors at the selected temporary relocation site during the annual in-water construction window (16 September through 31 March) while the project is ongoing. When the new fuel pier is completed and the barges return to their existing location, The Everingham Brothers Bait Company will remove the anchors at the temporary location.

Table 2-13 shows how much open water there would be for recreational navigation between the bait barges at either of the two proposed potential relocation sites and several points around San Diego Bay.

Figure 2-12
Potential Bait Barge Temporary Relocation Sites Considered Harbor Island

Table 2-12. Potential Bait Barge Harbor Island Relocation Sites

Option	*Location*	*Layout*	*Owner*	*Site Restrictions*
1	Southeast Harbor Island, parallel to Harbor Island Drive	End-to-end	Port of San Diego	• The side closest to Harbor Island would not be operational for both bait barges • The eastern bait barge would overlap eelgrass • Potential depth issues for both barges • Potential impacts to the C Level restaurant • Within the 120 dB ZOI
2	Southeast Harbor Island, parallel to Harbor Island Drive	Side-to-Side	Port of San Diego and CSLC	• One side of one bait barge would not be operational • The northern bait barge would overlap eelgrass • Potential depth issues for the northern barge • Potential impacts to the C Level restaurant
3	Southeast Harbor Island, parallel to Harbor Island Drive, west of Option 2	Side-to-Side	Port of San Diego and CSLC	• One side of one bait barge would not be operational • Potential eelgrass overlap • Potential depth issues for the northern barge • Within the 120 dB ZOI for underwater construction sound
4	West of Option 4A	Side-to-Side	CSLC	• Within the 120 dB ZOI for underwater construction sound
4A	*See Figure 2-2*	*Side-to-Side*	*CSLC*	• *Under consideration*
5	West of Option 6	Side-to-Side	CSLC	• Plotted underwater cable corridor in area • Proximity to viewfront of Harbor Island restaurant
6	East of Option 6A	Side-to-Side	CSLC	• Proximity to commercial boating facilities and underwater cables
6A	*See Figure 2-2*	*Side-to-Side*	CSLC	• *Under consideration*

Notes: CSLC = California State Lands Commission. NBC = Naval Base Coronado. NBPL = Naval Base Point Loma. SDUPD = San Diego Unified Port District. NAS = Naval Air Station. dB = Decibel. ZOI = Zone of Influence
Source: NAVFAC Southwest 2012d, Everingham Brothers Bait Company 2012.

Table 2-13. Approximate Open Water Distances Between Proposed Potential Temporary Bait Barge Locations and Points in San Diego Bay

From	*To*	*Distance (feet)*
Option 4A	Harbor Island	1,000
	Federal Navigation Channel	800
	NAS North Island	2,400
	San Diego Bay East Shore	6,000
Option 6A	San Diego Bay North Shore (Coast Guard)	1,300
	San Diego Bay East Shore	1,800
	Federal Navigation Channel	2,900
	NAS North Island	3,800

2.2.2 Alternative 2 Delayed Dredging Alternative

Implementation of Alternative 2 would be the same as described under Alternative 1, except that dredging would occur years after completion of the fuel pier replacement. After completion of the pier replacement, the Navy marine mammal enclosures would be returned to their current site. The Navy MMP relocation period is required only for the duration of construction and demolition activities. As with Alternative 1, it is anticipated that dredging would take approximately 3 months to complete. Either a clamshell or a hopper dredge could be used, depending on availability, and the dredged material would be transported to the beneficial reuse site at SSTC.

With adoption of the following minimization measures, the Navy MMP could remain at its existing location and would not have to temporarily relocate during the dredge-only activities (NAVFAC Southwest 2011h).

- Dredging would occur during ebb tide when any turbidity that was actually caused would flow away from the Navy MMP facility.
- The dredging duration would be no more than 9 months.

The validity of laboratory analytical results for determination of suitability of dredge sediments for ocean disposal expires within approximately 3 years. Sediment characterization samples for Alternative 1 were collected and analyzed in November of 2010. If the turning basin dredging is not accomplished by late 2013/early 2014, it would be necessary to repeat the sampling and analysis to obtain current results. Therefore, should Alternative 2 be implemented, additional time (approximately 6 months) and funding would need to be built into the project to plan for another round of sampling, analysis, and coordination of second disposal suitability determination through USEPA and USACE.

All other components of Alternative 2 (i.e., demolition of the existing fuel pier, phased construction of a double deck and mooring dolphin replacement pier, and amendments to the security navigation zone) would be identical to those described under Alternative 1 and would begin in spring of 2014. Buildings 110 and 140 on the existing fuel pier would be demolished and a new onshore control tower would be constructed as part of military construction project P-401. Temporary relocation of the Everingham Brothers Bait Company bait barges would also occur, and the impacts would be the same as for Alternative 1.

2.2.3 No-Action Alternative

Under the No-Action Alternative, the Navy would not implement the demolition of the existing fuel pier, construction of the new fuel pier facility, or dredging activities. The Navy is making every effort to bring the existing fuel pier into compliance with Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) requirements with the exception of geotechnical, structural, mooring/berthing, pipe stress, and other MOTEMS requirements (Navy 2012d). However, new construction is the only viable solution (Navy 2010a). To bring the existing structure into compliance with current standards is not feasible given the existing structural system and the condition of the structure. Structural, seismic, and operational deficiencies of the existing pier would continue, and would likely worsen due to deterioration of the facility, portions of which are over 100 years old. Notwithstanding the remaining seismic deficiencies, current and future demand for a fuel pier to safely accommodate deep draft vessels would not be met.

Under the No-Action Alternative, the Navy MMP would not be temporarily relocated to NMAWC and the Everingham Brothers Bait Company barges would not be temporarily relocated southeast of Harbor Island. Although the fuel pier itself would not be demolished, Buildings 110 and 140 on the existing pier would be taken down, and a new onshore control tower would be constructed as part of military construction project P-401.

The No-Action Alternative is not considered a reasonable alternative because it does not meet the purpose of and need for the Proposed Action as required under Council on Environmental Quality (CEQ) regulations (40 CFR 1502.14[d]). However, it does provide a measure of the baseline conditions described in Chapter 3, against which the potential adverse impacts of the Proposed Action can be compared. As such, the No-Action Alternative is carried forward for analysis.

2.2.4 Alternatives Considered but Not Carried Forward for Detailed Analysis

Due to the requirement for the fuel pier to be located near the NBPL DFSP fuel storage facilities, an alternate shoreside access location for the new pier would not be viable and thus would not be considered a reasonable alternative. Five project design alternatives with the same shoreside access location as the existing pier were considered. As previously discussed, Alternative 1 was selected to be carried forward for detailed analysis in this EA. Application of the screening factors listed in Section 2.1 resulted in elimination of the other four design alternatives. The alternatives that were considered but not evaluated further in this EA due to specific screening factors for operational, safety, and natural resources constraints are discussed in the following paragraphs.

2.2.4.1 Full-Fixed Double Deck Pier (No Mooring Dolphins)

This alternative would provide a 1,500 ft by 50 ft fixed double deck berthing pier, with a 700 ft long approach segment. The top of the lower deck would be set approximately 5 ft above extreme high tide. The top of the upper deck would be set approximately 15 ft above the lower deck elevation. This pier alternative would provide berthing for one T-AKR, T-AO, or LPD, and would provide greatest versatility in accommodating the wide range of vessels requiring fueling berths at this facility. The upper deck would have sufficient height to safely reach fuel transfer points on the majority of larger ships (Navy 2010c) as described in Section 2.1. Fuel pipelines would be hung beneath the upper deck, providing maximum separation between pipelines and vehicles and deck operations. This alternative would also meet the majority of the other selection criteria. However, with an overall area of 110,000 sf, the full-fixed double-deck pier would have a larger footprint than Alternative 1 (65,865 sf). The 1,500 ft full-fixed pier would not meet the screening factor to minimize potential risks to aquatic resources and encroachment upon navigable waters. Therefore, this alternative was considered but eliminated from further evaluation.

2.2.4.2 Full-Fixed Single Deck Pier

This alternative would provide a single deck fuel pier, 1,500 ft long by 125 ft wide, with an area of 268,750 sf, including the 650 ft long approach segment. This pier alternative would provide berthing for one T-AKR, T-AO, or LPD, but would not have sufficient height for fuel load arms to safely reach fuel transfer points on vessels as described above in Section 2.1. In addition, the single deck pier would be unable to physically separate the fuel pipelines from on-deck operations. Fuel lines would be placed on the deck of the berthing pier between 1-ft high concrete berms. With deck widths of 125 ft and the greatest overall square footage of any of the potential design alternatives, the single deck pier would require the most in-water construction. Therefore, the single deck pier would not meet the screening factor to minimize potential risks to aquatic resources and encroachment upon navigable waters. For these reasons, this alternative would not meet the screening factors described in Section 2.1, and therefore, was considered but eliminated from further evaluation.

2.2.4.3 Single Deck Pier with Mooring Dolphins

This alternative would provide a new single deck fuel pier, 1,100 ft long by 125 ft wide. This alternative would extend the outboard berthing length to 1,500 ft by the addition of two 30 ft square mooring dolphins on each end of the pier. The total area, including the 650 ft long approach segment, would be 223,900 sf. This pier alternative would provide berthing for one T-AKR, T-AO, or LPD, with slightly less square footage than the full-fixed single deck pier alternative described above. Like the full-fixed single deck pier, this alternative would not have sufficient height needed for fuel load arms to safely reach fuel transfer points on larger vessels as described in Section 2.1.

Although the use of mooring dolphins for this alternative would reduce its area by 44,850 sf compared to the full-fixed single deck pier, it would be almost 158,035 sf larger than Alternative 1 and would require a correspondingly greater amount of in-water construction. This alternative would not meet the screening factor to minimize potential risks to aquatic resources and encroachment upon navigable waters. For these reasons, this alternative would not meet the screening factor described in Section 2.1, and therefore, was considered but eliminated from further evaluation.

2.2.4.4 Replace Fuel Pier "In-Kind"

This alternative would provide an "In-Kind" replacement fuel pier of a similar configuration. The replacement main pier would be a single deck pier, 950 ft long by 50 ft wide with a 600 ft long approach segment for a total of 77,500 sf. As such, it would only provide 950 ft of berthing on the outboard face and would not accommodate fueling of the T-AKR. Increasing the pier's feet of berthing to 1,050 ft, with a larger deck or by the addition of mooring dolphins would provide the required UFC berthing length for these vessels. As a single deck pier, this alternative would not have sufficient height needed for fuel load arms to safely reach fuel transfer points on larger vessels as described in Section 2.1. All 16 pipelines would have to be placed on top of the single deck between 1-ft high concrete curbs, leaving a narrow center lane less than 15 ft wide that would severely restrict mobile crane and forklift operations on the berthing deck. This alternative does not meet the UFC criterion of a 50-ft wide minimum deck work space for a fuel pier berthing deck as described in Section 2.1. This alternative would replace the existing fuel pier with a new pier 6,480 sf larger than the existing pier. However, Alternative 1 would replace the existing pier with a new pier that would be 11,635 sf smaller than the in-kind alternative and 5,315 sf smaller than the existing pier. Thus, the in-kind alternative would not meet the screening factor to reduce square footage and in-water construction. For these reasons, this alternative does not meet the selection screening factors in Section 2.1, and therefore, was considered but eliminated from further evaluation.

2.3 PREFERRED ALTERNATIVE

The Navy has identified Alternative 1 (Pier Replacement and Associated Dredging) as the Preferred Alternative.

2.4 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Potential environmental impacts have been analyzed for the following resources: biological resource habitats and communities, fisheries, birds, marine mammals, threatened and endangered species, water resources, hazardous materials and wastes, noise, air quality, transportation and circulation, and socioeconomics and environmental justice. Resources that were not carried forward for analysis because impacts would be negligible or non-existent include: geology and topography, public services and utilities, aesthetics, land use, cultural resources, and public health and safety. The resources considered but eliminated from detailed analysis and the rationale for their elimination are presented at the beginning of Chapter 3 of this EA.

Table 2-14 provides a summary of environmental consequences for Alternative 1, Alternative 2, and the No-Action Alternative, by resource area. Chapter 3 provides a detailed discussion of the baseline (existing) conditions and the environmental consequences.

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
Biological Resource Habitats and Communities	Other than the incremental deepening of deep subtidal habitat by dredging the high spot in the turning basin, no permanent change would result from dredging, temporary relocation of the Everingham Brothers Bait Company bait barges, or the temporary relocation of the Navy MMP. Minor and short-term impacts to vegetated and nonvegetated soft bottom benthic habitat would occur. The temporary relocation of the bait barges would not result in any impacts to habitats or communities because the relocation sites are in the same deep subtidal habitat as the existing location. Impacts to eelgrass from the proposed fuel pier would be minor (approximately 0.05 ac of eelgrass surveyed in 2011, and an additional 0.05 ac of habitat that historically supported eelgrass) and would be offset by using the Navy's established eelgrass mitigation bank. Eelgrass impacts from the temporary relocation of the Navy MMP would be minor (approximately 0.67 ac of eelgrass in 2011, and an additional 0.32 ac of habitat that historically supported eelgrass), temporary, and would be offset by using the established eelgrass mitigation bank. The structural habitat of the existing pier would be removed but largely replaced by that of the new pier; differences would be inconsequential. Organisms occurring in the immediate area may be lost or displaced directly by project activities (equipment or noise) or indirectly by short-term changes to suspended sediments, turbidity, dissolved oxygen, and light diffusion. Some invertebrates and fish within the dredge footprint would be lost to mortality due to entrainment during the dredging process. However, organisms are expected to return to the project area upon project completion, and epifauna are expected to recolonize the new fuel pier from nearby, undisturbed areas within a relatively short time period. Therefore, through the use of the preventative measures described below, the minor and short-term impacts to biological resource habitats and communities would not be significant. **Avoidance and Minimization Measures/Special Conservation Measures (SCMs):** Before proceeding with the project, the Navy would obtain the required Clean Water Act (CWA) Section 404/Rivers and Harbors Act (RHA) Section 10 permits. All required terms and condition of the permits would be implemented. The following avoidance and minimization measures are proposed for use during the proposed activities to reduce the potential	Impacts associated with Alternative 2 would be the same as those for the Alternative 1, with the exception that dredging activities would be delayed until years after completion of construction of the pier. Under Alternative 2, there would be no significant impacts to biological resource habitats and communities. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to utilize the NBPL fuel pier without replacement of the pier and without implementation of safety improvements. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	to impacts to habitats and communities. Fisheries, Birds, Marine Mammals, and Threatened and Endangered Species resource sections contain additional Avoidance and Minimization Measures applicable to those specific resources. • Sheet piling would be left in place to minimize sediment and eelgrass disturbance that would otherwise result from demolition activities. • In conjunction with a Caulerpa survey, a final pre-construction eelgrass survey would be conducted. Additionally, a post-construction eelgrass survey would be conducted and compared to both historical data and the pre-construction survey to determine the amount of eelgrass habitat permanently shaded, whichever is greater. This impact to eelgrass would be offset by using the Navy's established eelgrass mitigation bank. Temporary impacts at NMAWC would also be offset by the mitigation bank, but upon successful reestablishment of eelgrass within impacted areas at the NMAWC location, the bank would be credited for the reestablished acreage. • The contractor would use only clean construction materials suitable for use in the oceanic environment. The contractor would ensure no debris, soil, silt, sand, sawdust, rubbish, cement or concrete washings thereof, chemicals, oil, or petroleum products from construction would be allowed to enter into or placed where it may be washed by rainfall or runoff into waters of the U.S. Upon completion of the project authorized, any and all excess material or debris would be completely removed from the work area and disposed of in an appropriate upland site. • Spill kits and cleanup materials would be present during construction should there be a leak into the surrounding water. • All debris would be transported to, and disposed of, at an appropriate upland disposal site, or recycled if appropriate. • During project implementation, the Navy would regularly monitor construction activities to ensure that no deviation from the project as described herein is occurring. The Navy would report any violation of authorized impacts to the National Marine Fisheries Service (NMFS) within 24 hours of its occurrence. • The beach and adjacent strand/coastal scrub habitat inshore of the fuel pier and southward along the shore		

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	would not be used for any purpose.		
Fish	Fish communities and habitats would be temporarily affected by in-water construction and demolition. Temporary relocation of the bait barges would have no net effect because the barges would remain in the same habitat they currently occupy. The potential for injury to fish would exist at close ranges to impact pile driving. Within the corresponding Zones of Influence (ZOIs), fish are likely to move away from the pile being driven. Disturbance to fish is possible at greater ranges, but, if anything, only temporary behavioral reactions would be anticipated, without long-term consequences for fish populations. Impacts would not be significant. In conjunction with the NEPA process, the Navy consulted informally with National Oceanographic and Atmospheric Administration (NOAA)/ National Marine Fisheries Service (NMFS). An EFH analysis was conducted with an adverse effects finding. However, the Conservation Recommendation forwarded in the NOAA Fisheries response to the Navy EFH Analysis (refer to Appendix A) will be integrated into the Proposed Action. Approximately 0.05 ac of eelgrass habitat as of 2011, and an additional 0.05 ac of habitat that historically supported eelgrass, would be permanently shaded. This area represents a tiny fraction of that which is found within and adjacent to San Diego Bay (0.0027 percent and 0.0058 percent, respectively) and would be offset by using the Navy's established eelgrass mitigation bank. The proposed temporary relocation site for the Navy MMP would temporarily impact 0.67 ac of eelgrass surveyed in 2011, and an additional 0.32 ac of habitat that historically supported eelgrass; this temporary impact at NMAWC would be offset by using the established eelgrass mitigation bank. As such, implementation of Alternative 1 would not result in any significant impacts to fisheries or Essential Fish Habitat (EFH). **Avoidance and Minimization Measures/SCMs:** Avoidance and minimization measures integrated into the project design pertaining to Fisheries and EFH include the following: • Sheet piles beneath the existing pier would be left in place to minimize sediment and eelgrass disturbance. • In conjunction with a Caulerpa survey, a final pre-	Impacts associated with Alternative 2 would be the same as those for Alternative 1, with the exception that dredging activities would not take place until years after completion of the new fuel pier. Under Alternative 2, there would be no significant impacts to fisheries. Under Alternative 2, the same NOAA Fisheries Conservation Recommendation will be integrated into the Proposed Action as for Alternative 1. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to utilize the NBPL fuel pier without replacement of the pier and without implementation of safety improvements. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	construction eelgrass survey would be conducted. Additionally, a post-construction eelgrass survey would be conducted and compared to both historical data and the pre-construction survey to determine the amount of eelgrass habitat permanently shaded, whichever is greater. This impact to eelgrass would be offset by using the Navy's established eelgrass mitigation bank. Temporary impacts at NMAWC would also be offset by the mitigation bank, but upon successful reestablishment of eelgrass within impacted areas at the NMAWC location, the bank would be credited for the reestablished acreage. • The contractor would use only clean construction materials suitable for use in the oceanic environment. The contractor would ensure no debris, soil, silt, sand, sawdust, rubbish, cement or concrete washings thereof, chemicals, oil, or petroleum products from construction would be allowed to enter into or placed where it may be washed by rainfall or runoff into waters of the U.S. Upon completion of the project authorized, all excess material or debris would be completely removed from the work area and disposed at an appropriate upland site. • Spill kits and cleanup materials would be present during construction should there be a leak into the surrounding water. • During project implementation, the Navy would regularly monitor construction activities to ensure that no deviations from the project as described herein are occurring. The Navy would report any violation of authorized impacts to NMFS within 24 hours of its occurrence. The following avoidance and minimization measures would be followed during the proposed pile driving and dredging activities. • Soft Start - The use of a soft-start procedure is believed to provide additional protection to marine mammals by providing a warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. The Indicator Pile Program will utilize soft-start techniques (ramp-up/dry fire) recommended by NMFS for impact and vibratory pile driving. These measures are as follows: *"The soft-start requires contractors to initiate noise from vibratory hammers for 15 seconds at reduced energy followed by a 30-second waiting period. This procedure should be repeated*		

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	two additional times. If an impact hammer is used, contractors are required to provide an initial set of three strikes from the impact hammer at 40 percent energy, followed by a 30-second waiting period, then two subsequent 3-strike sets."		
Birds	Alternative 1 may disturb migratory bird breeding and resting in the immediate vicinity while construction and/or demolition activity is occurring. However, any impacts would be short-term, localized, and would not impact bird populations. Birds on the water regularly experience the noise and disturbance of passing vessels, while the project area is routinely subject to the elevated noise and activity of workers and equipment associated with common industrial practices. Hence, project-related noise is not expected to be a novel disturbance or to have strong effects on migratory birds. Indirect impacts to breeding because of reduced visibility or changes in prey distribution in response to noise or turbidity would similarly be localized, intermittent, and less than significant. No in-water demolition, construction, or dredging activities would occur during the least tern breeding season (1 April through 15 September). Temporary relocation of the bait barges would have no impact on bird populations because other structures provide abundant perch sites throughout the northern bay, and the barges would remain in the same habitat. Therefore, the Proposed Action would not have a significant impact under the Migratory Bird Treaty Act (MBTA) and there would be no significant impacts on other non-migratory marine bird habitat or populations. **Avoidance and Minimization Measures/SCMs:** Avoidance and minimization measures for birds would be the same as those for biological resource habitats and communities. Avoidance and minimization measures to protect California least terns are provided in the Threatened and Endangered Species resource section.	Impacts associated with Alternative 2 would be the same as those for Alternative 1, with the exception that dredging would not take place until years after completion of the new fuel pier. Under Alternative 2, there would be no significant impacts to birds. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to utilize the NBPL fuel pier without replacement of the pier and without implementation of safety improvements. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.
Marine Mammals	The Proposed Action would not result in any injuries or mortalities (Level A takes) of marine mammals. Temporary relocation of the bait barges outside of the underwater noise zone of influence would greatly reduce the exposure of marine mammals to project-related underwater noise. The Proposed Action has the potential, however, to result in minor behavioral effects (Level B takes) to four marine mammal species from underwater noise associated with impulsive or vibratory pile driving, construction, and demolition. One of the four species (harbor seal) may also be subject to behavioral effects from airborne noise. Considering the 6.5-month work	Impacts associated with Alternative 2 would be the same as those for Alternative 1, except that dredging would not take place until years after the completion of the new fuel pier. Under Alternative 2, there would be no	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to utilize the NBPL fuel pier without replacement of the pier and without implementation of

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	Alternative 1 Pier Replacement and Associated Dredging	Alternative 2 Delayed Dredging Alternative	No-Action Alternative
	windows for all 3 years combined, total Level B behavioral harassments (takes) are expected as follows: California sea lions – 2,405; harbor seals – 270; gray whales – 45; and coastal bottlenose dolphins - 2,016. Marine mammals that are taken (harassed) may change their normal behavior patterns (e.g., swimming speed, breeding habits, etc.) or be temporarily displaced from the area of construction. Any takes would likely have only a minor effect on individuals and no effect on the population. As such, the Proposed Action would result in minor behavioral effects on individuals and localized, temporary effects on their habitat use but is not anticipated to have any detectable adverse impact on population recruitment, survival, or recovery (i.e., no more than a negligible adverse effect). Therefore, the implementation of Alternative 1 would not result in any significant impacts to marine mammals. **Avoidance and Minimization Measures/SCMs:** In conjunction with the NEPA process, the Navy prepared and provided an Incidental Harassment Authorization (IHA) Application and an associated Monitoring Plan to NMFS (for the anticipated marine mammal takes) for approval before commencing in-water demolition/construction activities. NMFS accepted the IHA Application and Monitoring Plan and issued an IHA (refer to Appendix A). The Navy will abide by all conditions of the approved IHA. Section 3.4.3.2 details the avoidance and minimization measures set in place to lessen the impacts to mammals, which include avoidance and minimization measures for pile driving, a discussion of the avoidance and minimization measure effectiveness, monitoring, and reporting.	significant impacts to marine mammals. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, the Navy will abide by all conditions of the approved IHA. Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	safety improvements. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.
Threatened and Endangered Species	<u>California Least Tern</u> Conservation measures established in the Memorandum of Understanding (MOU) Between U.S. Fish and Wildlife Service and the U.S. Navy Concerning Conservation of the Endangered California Least Tern in San Diego Bay, California (Appendix E.2) would be followed, resulting in the avoidance of noise- and turbidity-producing in-water activities in designated least tern breeding habitat, which includes the project area, from 1 April through 15 September, when least terns are present nesting and breeding in San Diego Bay. No effects would be associated with the temporary relocation of the bait barges, which would occur outside of the breeding season. No persistent effects on breeding conditions are	Impacts associated with Alternative 2 would be the same as those for Alternative 1, with the exception that dredging would not take place until years after completion of construction of the pier. Under Alternative 2, there would be no significant impacts to	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to utilize the NBPL fuel pier without replacement of the pier and without implementation of safety improvements.

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	expected once in-water construction/demolition activities are halted. At other times, the onshore noise and activity associated with the project would be similar to ongoing activities at NBPL and not expected to affect least tern breeding in the adjacent waters. There would be no effect on least tern nesting colonies, the nearest of which is across the bay at Naval Air Station (NAS) North Island. The Navy made a no effect determination on the California least tern. There would be no significant impact on the California least tern. <u>Green Sea Turtle</u> Potential impacts to green sea turtles would primarily be from noise generated during demolition, construction, or dredging activities. In-water activities would only overlap the tail end of the warm-water period when sea turtles are most likely to move through the project area; sea turtles are not expected to occur in northern San Diego Bay during the fall-winter timing of in-water construction/demolition and pile driving activities. Proposed monitoring would limit the potential exposure of sea turtles to underwater sound and in-water activities, and sea turtles would be able to detect and avoid these activities. Although it is unlikely that a sea turtle would move within a distance of potential Level B effect, sound generating activities would cease upon detection. Furthermore, no sea turtle habitat would be impacted by any project activities and all avoidance and minimization measures would be implemented to avoid potential impacts to green sea turtles from pile driving activities. No effects to sea turtle movements or habitat use are anticipated from the temporary relocation of the bait barges. The Navy consulted informally with NMFS (green sea turtle) and NMFS provided a letter (refer to Appendix A) concurring with the Navy's determination that the Proposed Action may affect, but is not likely to adversely affect green sea turtles. Therefore, the Navy has concluded that Alternative 1 may affect, but is not likely to adversely affect, the green sea turtle, and is consulting informally with NMFS to request concurrence with this conclusion. There would be no significant impact on the green sea turtle. Programmatically, the Navy will continue to consult informally with NMFS on other Navy construction activities and facilities projects throughout San Diego Bay to identify any risks that could negatively impact sea turtles and to agree upon related avoidance and minimization measures. These measures would support a programmatic "may affect, not	threatened and endangered species. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	**Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	likely to adversely affect" finding that would be subject to the regulator's written concurrence. <u>Western Snowy Plover</u> Since the western snowy plover is not known or expected to occur in the project area, there would be no effect on individuals or potential habitat for this species. The Navy made a no effect determination on the western snowy plover. Therefore, there would be no significant impact to western snowy plovers. <u>Other Special Status Species</u> The project sites are not in proximity to important breeding, resting, or breeding areas for bird species, and similar habitats are abundant throughout San Diego Bay. No impacts are anticipated from the temporary relocation of the bait barges within the same deep subtidal habitat. Potential disturbance of shoreline and adjacent open water areas that may be used on a transient basis by sensitive water and shore bird species would be short-term and less than significant. Noise generated during demolition, construction, and dredging activities would not substantially increase noise levels. Additionally, these increases in noise and activity would not vary substantially from normal levels of activity, vehicular traffic, and marine vessels operating in the immediate area and would cease upon completion of demolition, construction, and dredging activities. Therefore, with implementation of Alternative 1 there would be no adverse effect on these species' populations or habitats. **Avoidance and Minimization Measures/SCMs:** The following avoidance and minimization measures would be utilized during the proposed activities to reduce the potential to impact threatened and endangered species: • Dredging and other in-water demolition or construction would not occur during the endangered California least tern breeding season (1 April – 15 September). • The Navy would continue to follow the conservation measures established in the current Tern MOU (Appendix E.2). • In conjunction with marine mammal monitoring (Section 3.4.3.2 of this EA) (currently part of the Navy's IHA application), qualified observers will also search for and document any occurrence of sea turtles within areas of potential effect or interaction with the project. During pile driving/extraction activities, monitoring will extend to the		

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	limit of potential Level B behavioral harassment, specifically to the underwater 160 decibels (dB) re 1 microPascal (μPa) (root mean square [rms]) isopleth for impact pile driving; and for vibratory pile driving or extraction, to either the underwater 120 dB re 1 μPa (rms) isopleth or to the point at which project sound becomes indistinguishable from background noise (maximum project sound pressure level [SPL] [rms] ≤ median ambient rms), whichever is less. A 10-meter (m) buffer zone will also be monitored during other in-water operations of equipment and vessels. Monitoring will commence at least 15 minutes prior to the activities. • If any sea turtle is seen within these visual ranges prior or during the corresponding activity, the activity would not commence until the animal has moved out of the area or at least 15 minutes has passed since the last such sighting. • Programmatically, the Navy will continue to consult informally with NMFS on sea turtle occurrence and Navy construction activities and facilities projects throughout San Diego Bay to identify any risks that could negatively impact sea turtles.		
Water Resources	There would be no impact to bathymetry from temporary relocation of the Navy MMP, the Everingham Brothers Bait Company bait barges, and pier demolition and construction. The impact to bathymetry from dredging the high spot in the existing turning basin would be less than significant because most of the area, surrounding the proposed dredge footprint is already deeper than the proposed dredge depth (-40 ft mean lower low water level). Use of dredge sediments for nearshore replenishment at SSTC beach would be a beneficial impact. There would be minor, short-term localized increases to circulation in San Diego Bay in the project areas caused by vessel movement, in-water demolition, construction, and dredging; these increases would cease when each particular activity ends. The in-water structures to be installed (the new fuel pier and the temporary Navy MMP facilities) would not form barriers to the natural movement of water in San Diego Bay. Temporary relocation of the Everingham Brothers Bait Company bait barges would not involve in-water construction, dredging, or other activity that would affect movement of water in San Diego Bay. Increased turbidity because of sediment resuspension during demolition and construction would be short-term and limited	Under Alternative 2, dredging would be done years after the pier replacement effort is completed. Thus under this Alternative, there would be no potential intermittent overlap of increased turbidity associated with demolition and construction activities. With the exception of when dredging would occur, Alternative 2 is the same as Alternative 1, Alternative 1. Under Alternative 2 there would be a beneficial impact to	Under the No-Action Alternative, no in-water demolition, construction dredging, and sediment beneficial reuse activities would occur and existing water resources would not be affected. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	to the demolition/construction areas around the fuel pier. Increased turbidity while dredging with either a hopper or clamshell dredge would be short-term as well, because the dredge material is larger-grained material (sand) that tends to settle quickly. The Navy MMP is covered under NBPL's overall National Pollutant Discharge Elimination System (NPDES) permit, which would be amended for the temporary relocation of the Navy MMP to NMAWC. Based on analytical testing, the physical and chemical composition of the sediment from the fuel pier and proposed NMAWC project footprint disturbance areas indicates larger grain size (sand) and low concentrations of contaminants. These results indicate contaminant resuspension during project activities would have minimal effect on fish and EFH. Therefore, impacts to water quality as a result of turbidity from sediment resuspension would not be significant. It is not anticipated that bacteria loading from Navy marine mammals alone would exceed San Diego Basin Plan waters designated for contact recreation beneficial uses (REC-1) water quality limits at the proposed 100 ft-security barrier that would be established around the temporary MMP facilities; therefore, significant impacts to water quality would not occur. However, the Navy would monitor water quality while the MMP occupies the temporary relocation site at NMAWC. If the monitoring results indicate that water quality is impacted by this action more than currently anticipated, the Navy would employ adaptive management measures in consultation with California Coastal Commission (CCC) staff (described below under Avoidance and Minimization Measures/SCMs). The new fuel pier would have stormwater management capabilities that would comply with current NBPL permit requirements. All rainfall accumulating on the lower deck as well as rainfall from the 85th percentile storm event accumulating on the upper deck of the new pier would be captured and pumped to NBPL's fuel oil reclamation facility for treatment. Basewide and site-specific Best Management Practices (BMPs) to prevent impacts to surface water would be followed at the new fuel pier. Therefore, with implementation of Alternative 1, no significant impacts to water quality would occur. During demolition, construction, dredging, and sediment beneficial reuse, protective measures would be implemented	bathymetry due to use of dredged sediments for nearshore replenishment at SSTC beach; There would be no significant impacts to circulation and water quality. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	to minimize impacts to marine water quality. Protective measures for demolition and construction would include the use of catch devices and sheeting to prevent the release of debris and hazardous materials/waste into San Diego Bay, and the NBPL Emergency Response Action Plan to minimize the effect of any spills that might occur. As a protective measure to prevent turbidity, the sheet pile beneath the existing fuel pier would be retained. All in-water work would comply with the requirements of a Section 401 Water Quality Certification from the San Diego Regional Water Quality Control Board (RWQCB) and Section 404/Section 10 permits from the USACE. For the reasons listed in the preceding paragraphs, with implementation of Alternative 1 there would be no significant impacts to bathymetry, circulation, and water quality within San Diego Bay. **Avoidance and Minimization Measures/SCMs:** The following avoidance and minimization measures/SCMs would be implemented as part of Alternative 1 to reduce impacts to below a level of significance: • Sheet piles beneath the existing fuel pier would be left in place to minimize sediment and eelgrass disturbance. • The demolition and construction contractors would be required to prepare and implement a Construction Demolition Plan that would cover all phases of the work to be done. The contractors' plan would be required to specify materials, equipment, and procedures to be used to contain all construction and demolition waste and debris. • Contractors would be required to use catch devices and sheeting to capture and contain debris. • Before demolition begins, the contents of each pipeline would be pumped out. The pipelines would be cleaned to minimize accidental release of pipeline residue during demolition activities. Pipeline contents and cleaning water would be captured and properly disposed. • Per the NBPL Emergency Response Action Plan, any petroleum release or petroleum sheen observed on the water surface would be reported to the National Response Center and other agencies as required. • Booms and other spill containment equipment kept on hand would be immediately deployed, the source of the release would be determined and secured, and cleanup		

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Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	measures appropriate to the nature and extent of the spill would be implemented. These procedures would minimize the potential for contaminants related to project activities to enter marine waters. • Potential adaptive management measures to reduce bacteria concentrations in the waters surrounding the proposed NMAWC temporary relocation site for the Navy MMP could include: housing 27 of the Navy MMP 30 sea lions in the southernmost enclosures, where bay circulation is greater; removing solid sea lion scat from walkways and enclosures before pressure washing; transferring some of the animals back to the existing Navy MMP location (near the fuel pier) during non-pile driving activities; and installing ultraviolet treatment systems or aeration equipment to enhance bacterial degradation. • Upon completion of the new fuel pier, the NBPL Storm Water Discharge Management Plan and the fuel pier BMPs would be reviewed, and revised/updated as needed to incorporate changes resulting from the changes to the fuel pier structure and/or operations. The NBPL Storm Water Discharge Management Plan and Basewide BMPs for preventing and minimizing contact of potential pollutants with stormwater would continue to be followed, including: restricting access, regular cleaning and sweeping, controlling spills and reducing waste, avoiding hosing down the site, and regular inspection and maintenance of the storm drain system. All BMPs specific to the fuel pier would also be followed. • A Section 401 Water Quality Certification from the RWQCB would be obtained, as would a Section 404/Section 10 permit from the USACE; these permits would apply to all in-water components of the project.		
Hazardous Materials and Wastes	Through the use of the preventive measures described below and implementation of the procedures described in the Emergency Response Action Plan in the event of an accidental release, no increase in human health risk or environmental exposure to hazardous materials or hazardous wastes would occur with implementation of Alternative 1. Therefore, implementation of Alternative 1 would not have a significant impact with respect to the use, storage, or disposal of hazardous materials or hazardous wastes. Through adherence to Navy Region Southwest (NRSW) recycling and waste minimization requirements and reuse of	Under Alternative 2, the same project components would occur as for Alternative 1, involving the same types and volumes of hazardous and non-hazardous materials and wastes. Therefore, no significant impacts	Under the No-Action Alternative, fueling operations currently being conducted at the existing fuel pier would continue. Therefore, there would be no change from the existing conditions. **Avoidance and**

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	the construction materials required for the Navy marine mammal temporary relocation component, implementation of Alternative 1 would not have a significant impact to solid waste and regional landfill capacity. **Avoidance and Minimization Measures/SCMs** • The Navy would characterize all hazardous wastes associated with demolition of the existing fuel pier (building materials falling under the Universal Waste Rule, coal tar coating on the steel superstructure, lead-based paint (LBP), asbestos-containing materials (ACMs) (if determined to be present), and treated wood waste for proper disposal at an appropriately-permitted facility. • Construction contractors would be required to prepare and implement a comprehensive debris management plan to address types of debris expected, separation, and retrieval methods. • Catch devices and sheeting would be used to capture and contain debris, and floating booms would be placed around the work site to confine any potential release to a minimal area. • Contractors involved with construction and demolition for all components of Alternative 1 would be subject to all federal, state, and San Diego County requirements for hazardous materials and hazardous waste management, and would be required to follow the requirements of the NRSW Waste Management Plan (NRSW 2007). In addition, demolition and construction contractors would implement BMPs designed to minimize the potential for hazardous material releases during demolition and construction activities. • Emergency procedures in Section 5 of the NRSW Waste Management Plan would be followed upon discovery of any spill or release either in or outside the work area. • A safety buffer zone would be established between the underwater fuel pipelines to NAS North Island and the demolition/construction work zone and dredge footprint. All contractors' equipment and vessels would remain outside the safety buffer zone. • Before the fuel pier is demolished, all fuel, lubricating oil, and contaminated petroleum product inside the pipelines on the fuel pier would be pumped out and the pipelines would be cleaned.	associated with hazardous materials, hazardous wastes, public health and safety, and solid waste would occur. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	**Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	• In the event of an accidental spill or release of oil or hazardous substance, the procedures in the NBPL Emergency Response Action Plan would be followed to contain the release and minimize impacts. • The proposed project would be required to prepare and follow a Navy-approved Explosives Safety Submission Determination Request (ESS DR) that details how Navy explosives safety standards would be evaluated and employed to ensure protection of personnel and Navy assets in the event of unintentional detonation during project activities. The water depths in the project areas where pile driving and dredging would take place would absorb the shock waves and fragmentation of an accidental detonation. The dredged sediments would be screened to remove potential discarded military munitions (DMM), and NRSW Explosive Ordnance Disposal (EOD) Mobile Unit 3 Detachment would respond if needed. With the protective effect of the pile-driving site, water depths, and use of the above-referenced safety plans and procedures there would be no significant impact from DMM. • The USCG and CSLC would continue to inspect fuel pier operations while the existing fuel pier remains in use during the first phase of construction, and would inspect the new pipelines and fuel pier operations when the new pier is completed. The pipelines on the new fuel pier would be constructed according to applicable federal and state regulations for pipelines and marine bulk fuel transfer facilities. • The oily water pipeline for the new fuel pier would be designed and tested in accordance with the requirements of California Code of Regulations (CCR) Title 22, Chapter 15-Interim Status Standards for Owners and Operators of Hazardous Waste Transfer, Treatment, Storage, and Disposal Facilities, Article 10 Tank Systems and the applicable guideline standards in the American Petroleum Institute Standard 650 Welded Tanks for Oil Storage. • Hazardous wastes that would be generated at the new fuel pier would continue to be managed according to federal, state, and county regulations, and be recycled/disposed of appropriately by licensed contractors. The San Diego County Department of Environmental Health would continue their regulatory oversight of hazardous waste activities at the new fuel pier.		

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
Airborne Noise	Pile driving would be the dominant noise-generating activity associated with the proposed project. All pile driving would take place during daylight hours (nominally 7:00 A.M. to 4:00 P.M. on weekdays). During pile driving, outdoor airborne noise levels in residential areas beyond the NMAWC boundary and in the La Playa neighborhood north of NBPL would not exceed City of San Diego construction noise ordinances (75 decibels A-weighted [dBA]). During pile driving at NMAWC, the indoor noise levels at schools and day care centers beyond the NMAWC boundary would be slightly greater than the classroom criteria levels for effective hearing with windows closed (35 dBA). Since the pile driving would be intermittent during the school day these levels would be considered acceptable and therefore, would not result in a significant noise impact. During pile driving at NBPL, the indoor noise levels with windows closed at the Child Development Center (CDC) at Building 377 at NBPL would be slightly greater than the classroom criteria levels for effective hearing (35 dBA). Since the pile driving would be intermittent during the school day, and there would be 5.5 months without pile driving (during the least tern breeding season), these noise levels would be considered acceptable and therefore, would not result in a significant noise impact.	Under Alternative 2, the noise impacts associated with the demolition, construction, and dredging activities would be the same as those discussed under Alternative. 1. However, dredging would take place years after construction was completed, so noise from dredging would occur in the absence of other project-related noise.	Under the No-Action Alternative, industrial activities currently being conducted in the area would continue, and the area's acoustical environment would remain unchanged. Therefore, there would be no noise impacts associated with the No-Action Alternative.
	Avoidance and Minimization Measures/SCMs: The following avoidance and minimization measures/SCMs would be implemented as part of Alternative 1 to reduce noise impacts to below a level of significance: • Construction activities, including pile driving, would only occur during daylight hours (nominally 7:00 A.M. to 4:00 P.M., Monday through Friday). • The educational facilities listed in Tables 3.8-1 and 3.8-2 of this EA would be informed of the dates of pile driving and advised to close classroom windows during the pile driving intervals. The following additional avoidance and minimization measures/SCMs could be implemented as part of Alternative 1 to further attenuate noise levels if a greater reduction is desired. • Noise monitoring for classroom criteria. • Acoustic blankets around the pile driver. • Pile cushions could be used to reduce noise levels.	**Avoidance and Minimization Measures/SCMs:** Under Alternative 2, avoidance and minimization measures/SCMs would be the same as those for Alternative 1.	**Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
Air Quality	Operational emissions would primarily be from mobile sources associated with the use of the pier, including Navy marine vessels and ground vehicles that would service the pier. Because the purpose of the Proposed Action is to replace the aging, seismically deficient, and obsolete pier with a new pier that would improve safety and fuel receipt and delivery capabilities, Alternative 1 is designed to serve existing needs and would not result in increases in mobile source emissions. Therefore, the air quality analysis focuses on construction activities required to replace the pier. Estimated annual construction emissions with implementation of Alternative 1 would be below the *de minimis* threshold levels for Clean Air Act (CAA) conformity. In addition, Alternative 1 would conform to the San Diego Air Basin Shore State Implementation Plan (SIP) and would not trigger a conformity determination under Section 176(c) of the CAA. The Navy has prepared a Record of Non-Applicability (RONA) for CAA conformity (Appendix G of this EA). No health effects would be anticipated from emission of hazardous air pollutants (HAPs) because the majority of project activities occur in restricted areas where there are no sensitive receptors (i.e., residents, schools, hospitals, etc.). Therefore, with implementation of Alternative 1, significant impacts to air quality would not occur. **Avoidance and Minimization Measures/SCMs:** The following avoidance and minimization measure/SCM would be implemented as part of Alternative 1 to ensure that impacts are reduced to below a level of significance: • All necessary construction or operationally-related permits would be authorized by the San Diego County Air Pollution Control District (SDCAPCD) before project implementation occurs.	Impacts associated with Alternative 2 would be the same as those for Alternative 1 with the exception that dredging would take place years after completion of the new fuel pier. Under Alternative 2, there would be no significant impacts to air quality. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, the avoidance and minimization measure /SCM would be the same as for Alternative 1.	Under the No-Action Alternative, existing conditions would remain unchanged. The Navy would continue to operate the NBPL fuel pier without replacement of and without implementation of safety improvements. There may be additional air quality impacts should vessels be required to wait until the pier is available and conduct additional maneuvering for safety purposes. **Avoidance and Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.
Transportation and Circulation	Proposed demolition and construction associated with replacement of the NBPL fuel pier would cause temporary and less than significant changes to traffic and circulation in the region of influence (ROI) during the demolition/construction period. Temporary changes to traffic and circulation associated with temporary relocation of the Navy MMP to NMAWC would also be less than significant. Operations at the new fuel pier would not result in additional vehicle traffic to the pier because the number of workers and	Impacts associated with Alternative 2 would be the same as those for Alternative 1, with the exception that dredging activities would be delayed until completion of construction of the pier. Under	Under the No-Action Alternative, roadway and vessel traffic conditions would remain unchanged. Therefore, no significant impacts to transportation and circulation would occur. **Avoidance and**

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
	work vehicles would not change. Implementation of Alternative 1 would not result in any change to baseline Level of Service (LOS) on any roadway segment or intersection in the region of influence. Moreover, Alternative 1 would not cause a substantial traffic impact based on City of San Diego criteria. Therefore, impacts to transportation and circulation would not be significant. **Avoidance and Minimization Measures/SCMs:** The following potential avoidance and minimization measure/SCM could be implemented as part of Alternative 1 to facilitate site access if it is desired to further reduce the volume of project traffic on Rosecrans Street during project construction. • If needed, trucks going to and from the fuel pier construction area could be staged or queued at the Navy's truck inspection site on Cabrillo Memorial Drive. Staged/queued trucks would enter and leave NBPL and the fuel pier construction site via the McClelland Gate. In order to avoid potential cumulative impacts relative to marine traffic, the following minimization measure is recommended: • To ensure safety of all vessels using San Diego Bay, the Navy would coordinate with the USCG to issue a Notice to Mariners when in-water components of this project are occurring, including temporary relocation of the Navy marine mammals and the Everingham Brothers Bait Company bait barges, dredging and sediment disposal.	Alternative 2, there would be no significant impacts to Transportation and Circulation. **Avoidance and Minimization Measures/SCMs:** Under Alternative 2, the potential avoidance and minimization measure/SCM would be the same as for Alternative 1.	**Minimization Measures/SCMs:** Under the No-Action Alternative, avoidance and minimization measures/SCMs would not be necessary.

Table 2-14. Summary of Potential Impacts and Avoidance and Minimization Measures/Special Conservation Measures

Resource Area	*Alternative 1 Pier Replacement and Associated Dredging*	*Alternative 2 Delayed Dredging Alternative*	*No-Action Alternative*
Socioeconomics, Environmental Justice, and Growth Inducement	There would be an overall beneficial impact to the economy of San Diego County from the fuel pier replacement and dredging project. Economic benefits associated with construction activities would more than offset potential reductions in economic activity in industries related to recreational fishing, leading to a net beneficial economic impact to San Diego County during the life of the project. No low-income or minority populations would be disproportionately or adversely affected, so no environmental justice impacts would occur. There would be no housing development or need for an in-migrating construction workforce, nor would any constraints to growth be removed, so there would be no impacts associated with induced growth.	Impacts associated with Alternative 2 would be the same as those for the Alternative 1, with the exception that dredging activities would be delayed until years after completion of construction of the replacement fuel pier. Under Alternative 2, there would be no significant impacts to socioeconomics or environmental justice and no impacts associated with induced growth.	Under the No-Action Alternative, socioeconomic conditions would remain unchanged. Therefore, no significant impacts to socioeconomics or environmental justice would occur.

CHAPTER 3
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the existing environmental conditions on and around Naval Base Point Loma (NBPL) for resources potentially affected by implementation of the alternatives discussed in Chapter 2. Information presented in this chapter represents baseline conditions and identifies potential impacts against which Alternative 1, Alternative 2, and the No-Action Alternative are evaluated.

In compliance with the National Environmental Policy Act (NEPA), Council of Environmental Quality (CEQ) regulations, and United States (U.S.) Navy procedures for implementing NEPA, the description of the affected environment and environmental consequences focuses only on those resources potentially subject to impacts. In addition, the level of analysis presented in this Environmental Assessment (EA) is commensurate with the anticipated level of impact. Accordingly, the discussion of the affected environment (and associated environmental analyses) focuses on the following resources: biological resource habitats and communities, fisheries, birds, marine mammals, threatened and endangered species, water resources, hazardous materials and wastes, noise, air quality, transportation and circulation, and socioeconomics and environmental justice. Conversely, the following resource areas were not carried forward for analysis in this EA, as potential impacts were considered to be negligible or non-existent:

Geology and Topography. No changes to terrain would occur as a result of Alternative 1 or Alternative 2. The majority of the proposed construction would occur within previously developed areas at NBPL, Naval Mine and Anti-Submarine Warfare Command (NMAWC), and within the San Diego Bay. Minimal shoreside grading would be necessary at NMAWC to create a level surface for the temporary marine mammal pools. Since the replacement pier would be constructed just 5 feet (ft) from the existing pier, the shoreside excavation and finish grading necessary to accommodate the new fuel pier would be minimal as well. Localized excavation to extend the underground pipeline trench to the new pier, install underground utilities, and reroute the existing storm sewer would be minor. Additional grading and asphalt repairs would occur at the quay wall area. These minimal surficial modifications would not result in impacts to geology and topography. San Diego is a seismically active region, as is most of southern California. Seismic hazards can include landslides, ground shaking, surface displacement and rupture, liquefaction, and tsunamis. The new fuel pier, abutment, and associated shoreside facilities would be designed and constructed in conformance with Unified Facilities Criteria (UFC) and California State Lands Commission (CSLC) Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) requirements to withstand the forces of earthquakes with a 50 percent probability of occurrence with minor or no structural damage, as well as the forces of earthquakes with a 10 percent probability of occurrence with controlled, repairable damage (Naval Facilities Engineering Command [NAVFAC] Southwest 2011a). Therefore, implementation of Alternative 1 or Alternative 2 would not have a significant impact to geology and topography. Disposal of dredged sediments in the offshore zone at Naval Amphibious Base (NAB) Coronado Silver Strand Training Complex (SSTC) would be a beneficial impact, because the sediments (fine sand) would reworked by natural wave and current action to preserve the sandy beach profile.

Under the No-Action Alternative, no demolition, construction, dredging, and sediment disposal would occur. The Navy Marine Mammal Program (MMP) and the Everingham Brothers Bait Company bait barges would not be temporarily relocated. The existing fuel pier, which has exceeded its design life and is substandard for existing seismic regulations, would not be replaced. Therefore, no potentially significant seismic impacts would occur under the No-Action Alternative.

Public Services and Utilities. No new public services would be constructed under Alternative 1 or Alternative 2. Electrical and potable water service would be supplied as needed to the temporary Navy marine mammal enclosures constructed at the NMAWC marina piers, and would be removed when the marine mammals return to their existing location. Alternative 1 or Alternative 2 would include removal of all existing utility infrastructure and fueling systems and replacing the existing infrastructure with upgraded utility infrastructure and fuel pipeline systems to adequately service the ships. The new fuel pier would provide adequate deck space by using a double deck structure to completely separate the fuel lines from the fueling operations. The pipelines and utilities would be hung beneath the upper deck. Utilities would be in a dedicated vault separate from the pipelines. An existing sanitary sewer main that runs near the abutment for the new pier would be inspected for defects and structurally reinforced before pile driving begins, to protect the sewer main from potential vibration damage (NAVFAC Southwest 2011a). The stormwater outfall on the north side of the existing pier abutment would be rerouted to the north side of the proposed new pier abutment. The utility infrastructure and fuel system for the new fuel pier would be accommodated without significant change to the NBPL utility system/network capacity. There are no utility corridors in the proposed project area and the demolition/construction contractor would locate and avoid utility service lines. Therefore, implementation of Alternative 1 or Alternative 2 would not have a significant impact to public services and utilities.

Under the No-Action Alternative, demolition, construction, and dredging activities would not occur. The Navy MMP and the Everingham Brothers Bait Company bait barges would not be temporarily relocated. There would be no changes to the existing public services and utility connections to the existing Fuel Pier 180 or at NMAWC. Therefore, implementation of the No-Action Alternative would not have a significant impact to public services and utilities.

Aesthetics. The guide piles and floating walkways to be installed at the NMAWC marina piers would be similar to those already present and would not change the visual profile of the waterfront at NMAWC. When the temporary relocation period is over, the guide piles would be completely dismantled and removed, and the NMAWC waterfront would resume its original appearance.

The height of the existing Pier 180 is +15 ft mean lower low water (MLLW) (Terra Costa Consulting Group, Inc. 2010). Under Alternative 1 or Alternative 2, the new fuel pier upper deck would be + 31.75 ft MLLW (28 ft deck elevation plus the 3.75 ft concrete barrier around the deck perimeter). The total elevation of the double-deck portion would more than twice as high as the existing pier. There would be five 30 ft-high fuel loading arms mounted on the upper deck floor, and seven 33-ft high light poles mounted on the concrete barrier. The mooring and berthing dolphins (+14 ft and +13 ft MLLW, respectively) would be about the same height as the existing pier (NAVFAC Southwest 2011a).

When viewed as one of a suite of piers within the bay, the new pier would be compatible with the visual characteristics of other piers in the surrounding area. The new fuel pier would have a smaller footprint than the existing pier, so the visual impact of this increase in height would be somewhat offset by the double deck pier occupying a smaller area overall than the existing pier (Figures 3-1 and 3-2). The beneficial impacts that would occur from removing the aging Pier 180 from the bay would also serve to balance the visual impact of the new pier. Views within San Diego Bay would remain consistent with the military and industrial nature of the surrounding area. Therefore, implementation of Alternative 1 or Alternative 2 would not have a significant impact to aesthetics.

With respect to temporary relocation of the Everingham Brothers Bait Company bait barges, the bait barges are long, narrow low-lying vessels that resemble extended floating docks. The two bait barges have been in San Diego Bay for decades, and one section of San Diego Bay is essentially just like the rest: military, commercial, and recreational features are all simultaneously visible from every viewshed in and of the bay. San Diego Bay is characterized by wildlife occupation of marine structures such as docks and buoys, and recreational and commercial fishing visitors night and day. The barges are consistent with a waterfront or marina seascape and would not change the visual character of either of the proposed temporary relocation options 4A or 6A, south or southeast of Harbor Island, respectively. Further, within the timeframe of the proposed project, the two barges would not anchor at the relocation site during summer, and it is anticipated that they would return to their current location after the proposed new fuel pier is completed. While at the temporary relocation site, the barge owners would continue their efforts to deter marine mammals from hauling out on the barges. Section 101 (a) (4) of the Marine Mammal Protection Act (MMPA) allows private citizens and marina owners to deter California sea lions and Pacific harbor seals from hauling out onto docks and/or vessels and potentially damaging private property with non-lethal methods and techniques, such as: fencing, bull rails, closely-spaced posts, netting, swim step protectors, various noisemakers and visual repellents, high or low pressure water hoses, blunt tip "bull poles," and paint ball (non-toxic, water soluble paint only) or air soft guns (National Oceanic and Atmospheric Administration [NOAA] 2012a). Private owners of docks and vessels in the east Harbor Island area could use the potential deterrence methods for harbor seals and California sea lions as provided by NOAA (http://swr.nmfs.noaa.gov/deter/index.htm) if needed to deter animals from their property (NOAA 2012b). As allowed by Section 109 (h) of the MMPA, such deterrence does not constitute harassment, so there would be no significant impact to marine mammals. Therefore, implementation of Alternative 1 or Alternative 2 would not result in a significant aesthetics impact relative to temporary relocation of the two bait barges.

a) Existing Fuel Pier

b) Proposed Replacement Fuel Pier

Figure 3-1
View Looking West from Vessel in San Diego Bay

a) Existing Fuel Pier

b) Proposed Replacement Fuel Pier

Figure 3-2
View Looking Northeast from Fort Rosecrans National Cemetery

Under the No-Action Alternative, no demolition, construction, dredging and sediment disposal would occur. There would be no temporary relocation of the two Everingham Brothers Bait Company San Diego bay bait barges. There would be no changes to the existing views at NBPL and NMAWC, and San Diego Bay southeast of Harbor Island. Therefore, implementation of the No-Action Alternative would not have a significant impact to aesthetics.

Land Use. The current project land uses comprise Navy bulk fuel receiving and issuing at the fuel pier, recreational marina buildings and piers at the NMAWC site, recreational navigation (sailing and fishing) in San Diego Bay in the waters surrounding Harbor Island, and Navy training and limited public access at SSTC beach. Other than temporary use of the Navy's recreational piers by the MMP and amendment of the U.S. Coast Guard (USCG) Security Zone in the waters east of the fuel pier, no changes to land use would occur. Following construction of the new fuel pier, the Navy marine mammals would return to their existing location and recreational use of the NMAWC marina piers would resume. The existing military land use at the fuel pier would continue to support NBPL bulk fuel operations and no land use compatibility issues would occur. The Navy prepared a Coastal Consistency Determination (refer to Appendix A) and consulted with the California Coastal Commission (CCC) on all project components. The CCC found the proposed project to be consistent, to the maximum extent practicable, with the California Coastal Management Program (refer to Appendix A). Amendments to the existing USCG Security Zone are needed to provide an adequate security zone of 500 ft for the proposed new fuel pier alignment (Navy 2012).

The area proposed for temporary relocation of the Everingham Brothers Bait Company bait barges (see Figure 2-2) comprises commercial, recreational, and military (USCG) shoreside and waterside uses, including privately-operated marinas. As stated in Section 3.11.3.1 of this EA, the Everingham Brothers Bait Company bait barges provide a service demanded by the local recreational fishing industry. As such, the Everingham Brothers Bait Company commercial bait supply operation would not be out of character with the surrounding uses. In addition, the bait barges would only occupy the temporary site for about 6.5 months out of the year, from September 16 through March 31. There is sufficient open water in the proposed relocation space for Everingham Brothers', their customers, and other vessels such as sail boats to maneuver (see Table 2-13 in Section 2.2.1.6). Existing shoreside and waterside uses would be able to continue during the months that the bait barges would be anchored at the temporary relocation site. The current plan is for the Everingham Brothers Bait Company to return the barges to their existing site after the proposed new pier is constructed. Therefore, with implementation of Alternative 1 or Alternative 2 no significant impact to land use would occur.

The Navy leases a portion of the land at SSTC from the State of California, including the beach at Boat Lanes 8 and 9, and the waters offshore between 100 to 500 ft from the ordinary high water mark (Navy 2011). The proposed sediment beneficial reuse area in SSTC Boat Lanes 8 and 9 is approximately 1,200 ft offshore, so it is outside the leased lands. Boat Lanes 8 and 9 and their onshore beaches are used for military training, however, public access for recreation is allowed when training operations are not taking place (Navy 2011). Sediment disposal would occur for a maximum of 3 months. The detailed protocol used in the previous U.S. Army Corps of Engineers (USACE) channel dredge project would be followed to ensure that dredge disposal operations from the Proposed Action do not interfere with Navy training operations at SSTC . With respect to recreation, the sediment disposal vessel(s) in the nearshore zone would not affect onshore activities. As described below under Public Health and Safety and Recreation, there would be no beach closure affecting swimmers and surfers. Therefore, there would be no significant impact to land use associated with beneficial reuse of dredged sediments.

The Navy has coordinated with USCG to amend the Security Zone at the fuel pier 250 ft to the east as described in Section 2.2.1.4. There would be 700 ft of open water between the amended Security Zone boundary and the federal navigation channel so there would be sufficient space for recreational vessels. The new pier and the temporary marine mammal enclosures would extend beyond Navy waters into waters that are under the jurisdiction of the CSLC. Following completion of the NEPA process, Navy counsel would provide written notification to CSLC of the extension of Navy facilities into state waters. Because there would be adequate maneuvering space (358 to 480 ft for civilian vessels between the temporary 100-ft bayward Security Zone that would be established at NMAWC and West Harbor Island) and because the NMAWC Security Zone would be temporary, no significant impact to land use would occur at NMAWC. Therefore, with implementation of Alternative 1 or Alternative 2, no significant impact to land use would occur.

Under the No-Action Alternative, no demolition, construction, dredging, and sediment disposal would occur. The Navy MMP and the Everingham Brothers Bait Company bait barges would not be temporarily relocated. There would be no changes to existing land and bay uses at NBPL or NMAWC. Therefore, implementation of the No-Action Alternative would not have a significant impact to land and bay use.

Cultural Resources. Implementation of Alternative 1 or Alternative 2 would not affect any archaeological sites or other cultural resources, as none are found within the Area of Potential Effect (APE), as defined under the Navy Region Southwest (NRSW) Metro San Diego Programmatic Agreement (Metro PA) (NRSW 2003, NAVFAC Southwest 2008). The Proposed Action is located more than 100 meters (m) from identified historic properties. Consistent with Stipulation 6.A of the Metro PA, the APE is defined as the discrete site of the undertaking and any associated staging or laydown areas. Construction laydown areas would be staged outside the 100-m APE buffer of identified historic properties in the Fort Rosecrans Historic District.

Previous cultural resources investigations confirm that no historic properties are present within the APE. The Defense Fuel Support Point (DFSP) Fuel Pier (Pier 180, built in 1908 and 1942) has previously been determined by consensus and consultation to be ineligible for the National Register of Historic Places because it lacks historic and architectural significance (California State Historic Preservation Officer [CASHPO] 2005, Schmidt and Byrd 2004). The area at NMAWC proposed for temporary relocation of Navy MMP during the construction of the fuel pier is composed of bay-fill and does not possess the potential to yield historic or archeological resources. A 1997 investigation inventoried and evaluated all of NMAWC and concluded that the installation contains no built properties or archaeological resources eligible for listing in the

National Register of Historic Places (KEA Environmental 1997). The State Historic Preservation Officer concurred with this determination in 2001.

While the project area has no known archaeological resources, its onshore quay wall lay-down area is on land that was created as a leveled platform cut-and-filled from original bay shore terrain (circa 1905) to provide for coal storage as part of the Navy's Point Loma Coaling Station (NAVFAC Southwest 2012). This, and a subsequent 1940s filling that raised and extended the quay wall, overlie a now-buried beach and adjacent tidelands of the original, late 18th and early 19th century port of San Diego. This area was referred to as La Playa and was originally used in the Spanish-Mexican-era hide trade with American merchant ships from New England (NAVFAC Southwest 2012). This now buried beach was the location of hide houses and a custom house, with residences and other associated structures set further back from the bay. From here, cargos were hauled by road to the Pueblo of San Diego (now Old Town San Diego) (NAVFAC Southwest 2012).

The circa 1905 filling over the La Playa beach was done using relatively low-energy, horse-drawn technology that represents a potential archaeological evidence of this historic maritime activity to be preserved beneath the fill. However, no investigations have ever been made for the presence of such features or deposits. Accordingly, the project-derived ground disturbance on this onshore area of the project provides a currently unknown potential for affecting buried archaeological deposits, assuming such exist. If preserved with sufficient integrity, such potentially surviving archaeological content would be historically significant, so likely eligible to the National Register and subject to compliance on effect under Section 106 of the National Historic Preservation Act (NAVFAC Southwest 2012).

Compliance with Section 106 for the P-151 military construction project (MILCON) proceeds under the Metro PA (NAVFAC Southwest 2012). Under Stipulation 6.C of the Metro PA for compliance with 36 Code of Federal Regulations (CFR) 800.4(a)(1), the NBPL Cultural Resources Program determined that the APE was the discrete project area, including lay down areas on the quay wall (NAVFAC Southwest 2012). However, while there are no identified built or archaeological historic properties within the APE, the written historic evidence identifies a buried archaeological potential under the quay wall fill. (NAVFAC Southwest 2012). Under Stipulation 9 of the Metro PA, the Navy "will provide for archaeological monitoring of ground disturbing activities within areas of known or provisional archaeological sensitivity" for identifying the presence or absence of any sub-surface archaeological deposits of features during construction (NAVFAC Southwest 2012). Monitoring would not be required for in-water project activities like dredging or pier demolition.

In accordance with the Metro PA, the project is therefore required to retain qualified contracted archaeological monitoring support to identify, and assist in quickly dealing with, any such features or deposits encountered during site preparation excavations on the quay wall portion of the APE (NAVFAC Southwest 2012). In consultation with the NBPL Cultural Resources Program Archaeologist, the contracted archaeological consultant would, prior to construction monitoring, prepare a Monitoring and Discovery Plan that would lay out monitoring protocols, historic context, eligibility thresholds, and other required procedures for approval by the Navy (NAVFAC Southwest 2012).

In the absence of known historic properties, but with an identified archaeological potential, assessing effect in conformance with Stipulation 8.A of the Metro PA here requires that Section 106 compliance be as a conditional finding of "no historic properties affected" under 36 CFR 800.4(d)(1) (NAVFAC Southwest 2012). As such, the demonstration of Section 106 compliance here is provisional, pending results of the monitoring to be conducted during the ground disturbance site preparation phase described above (NAVFAC Southwest 2012).

If no historic-period deposits or features are identified during monitoring, or if those observed do not possess content or integrity sufficient to recommend their National Register of Historic Places eligibility, then the effects assessment under Stipulation 8 of the Metro PA would be "no historic properties affected" (NAVFAC Southwest 2012). If eligible deposits or features are found, but the project work would not adversely affect these, then the current "no adverse effect" would stand and the EA would remain unchanged (NAVFAC Southwest 2012). However, if newly-identified eligible deposits or features found would be adversely affected by project activities, then the project work affecting the deposits or features would stop for a period sufficient to provide for an expedited consultation to define resolution of the adverse effect, in accordance with 36 CFR 800.6, with the EA amended to reflect this change (NAVFAC Southwest 2012). This would require execution of a Memorandum of Agreement with the CASHPO, and possibly the Advisory Council on Historic Preservation, stipulating actions required for resolving the adverse effect (NAVFAC Southwest 2012). Project work would continue following completion of the stipulated actions (NAVFAC Southwest 2012). Therefore, implementation of Alternative 1 or Alternative 2 would not have a significant impact to cultural resources.

Under the No-Action Alternative, no demolition, construction, dredging, and sediment disposal would occur. Therefore, implementation of the No-Action Alternative would not have a significant impact to cultural resources.

Public Health and Safety. Existing regulations address the potential impacts to public health and safety by minimizing the risk of releases of bulk fuels, contact of stormwater with construction-related contaminants, and worker safety. There are strict federal and state regulations governing bulk fuel storage and handling, as described in Section 3.7.1 and 3.7.2. These regulations require that bulk fuel facilities have the appropriate containment and control components to prevent unexpected releases (NAVFAC 2009a). Federal and state regulations also require that bulk fuel facilities have contingency plans to minimize hazards to human health or the environment from fires, explosions, or any unplanned release of hazardous waste or constituents to air, soil, or surface water (NAVFAC 2009a). The contingency plan must describe the actions facility personnel would take, and must be carried out immediately whenever there is an incident that could threaten human health or the environment. In compliance with these regulations, the fuel pier has containment and control components to prevent releases, and NBPL has a contingency plan with an Emergency Response Action Plan that would be carried out to minimize the hazards to human health of any accidental release from the fuel pier. (NAVFAC 2009a). These same plans and procedures would be implemented under Alternative 1 or Alternative 2.

Implementation of Alternative 1 or Alternative 2 would include observance of multiple safety guidelines and regulations. Worker safety is monitored through required crane inspections by the NAVFAC Public Works Center. Cranes are inspected to ensure that they are operating in accordance with the specifications in NAVFAC P-307, *Management of Weight Handling Equipment* (NAVFAC 2009b, NAVFAC Southwest 2011b). Additionally, contractors would be required to comply with safety requirements of the Occupational Safety and Health Administration, the most recent versions of USACE EM 385-1-1 *Safety and Health Requirements* (USACE 2008), and multiple other NAVFAC Southwest and U.S. Navy health and safety instructions (NAVFAC Southwest 2011b). All of these requirements and regulations address the potential risks to health and safety and would be followed. In addition, public health and safety is discussed in Section 3.7.1 and 3.7.2 as it relates to hazardous materials and wastes and explosives safety. To ensure safety of all vessels using San Diego Bay and nearshore waters, the Navy would coordinate with the USCG to issue a Notice to Mariners when in-water components of this project are occurring, including moving the Navy marine mammal enclosures and the Everingham Brothers Bait Company bait barges to their respective temporary relocation sites, dredging, and sediment disposal at the receiver site at SSTC.

Sediment disposal in the nearshore zone at SSTC would take place about 1,200 ft from shore (Figure 2-10 in Section 2.2.1.5) so there would be no beach closure affecting swimmers or surfers. As described in Section 2.2.1.5, sediment samples from the proposed dredge footprint were analyzed in November 2010 and the material from the proposed dredge area was found to be suitable for nearshore disposal. Therefore, health threats to swimmers would not occur from nearshore disposal of dredge sediments at SSTC. Temporary, intermittent increased turbidity would likely occur during sediment disposal. However, disposal would last no more than 3 months. Signs would be posted along the beach to notify swimmers of the sediment disposal vessel and activities, and potential for temporary increased turbidity. Therefore, with implementation of Alternative 1 or Alternative 2, no significant impacts to recreation at SSTC would occur.

With respect to temporary relocation of the bait barges, the potential bait barge relocation sites under consideration southeast of Harbor Island were selected because they avoid bird-aircraft strike hazards for Navy and Lindbergh Field (San Diego International Airport) aircraft (NRSW 2012). No hazardous materials/waste concerns have been identified for the Everingham Brothers Bait Company bait barge operations. Hazardous materials/waste aboard the barges are managed according to applicable state and county regulations and through the current Navy license conditions, which are expected to be repeated in the CSLC lease.

The USCG has indicated that with respect to public health and safety concerns, their order of preference for bait barge relocation alternatives is Alternative 4 (which has been eliminated from consideration as indicated in Table 2-12), followed by Option 4A, followed by Option 6A. The USCG does not have an existing formally established or written aircraft Accident Potential Zones or crash hazard zones for its Sector San Diego installation, but does have well established aircraft operational approach and departure paths and did agree to consult with Naval Air Station (NAS) North Island air planners, existing NAS North Island Accident Potential Zone documentation, and/or NAVFAC Accident Potential Zone planners and then to provide a formal response with analysis on USCG operational preferences and safety requirements (USCG 2012a).

The USCG would issue a Notice to Mariners a few weeks before the bait barges move to the temporary relocation site, and the Notice would remain in effect for the duration of the barges' stay in that position (USCG 2012b). A Marine Information Radio Broadcast would be conducted for the first few days of the temporary relocation as well (USCG 2012b). The bait barges' operating procedures include full night-time illumination. While anchored at the temporary relocation site, the bait barges would comply with nighttime vessel navigation rules/restrictions as indicated by the USCG (Everingham Brothers Bait Company 2012). These regulations include carrying two unobstructed, all-round white lights visible to a distance of at least 1 nautical mile (USCG 2012b).

Before moving the bait barges to the temporary relocation site, the barge owners would deter marine mammals from hauling out on the barges with sprinklers or other non-injurious methods, and would continue to deter marine mammals from the barges while they are at the temporary location. Deterrence of nuisance animals is permissible under Section 109(h) of the MMPA and does not constitute harassment. Any potential animal-associated odors would be kept to a minimum on the bait barges, and would likely not be noticeable on shore (1,000 ft away at the closest point, Harbor Island north of Option 4A). Therefore, there would not be a significant public health and safety impact from any potential odors associated with the bait barges.

Section 101 (a) (4) of the MMPA allows private citizens and marina owners to deter California sea lions and Pacific harbor seals from hauling out onto docks and/or vessels and potentially damaging private property with non-lethal methods and techniques, such as: fencing, bull rails, closely-spaced posts, netting, swim step protectors, various noisemakers and visual repellents, high or low pressure water hoses, blunt tip "bull poles," and paint ball (non-toxic, water soluble paint only) or air soft guns (NOAA 2012a). Private owners of docks and vessels in the east Harbor Island area could use the potential deterrence methods for harbor seals and California sea lions as provided by NOAA (http://swr.nmfs.noaa.gov/deter/index.htm) if needed to deter animals from their property (NOAA 2012b). As allowed by Section 109 (h) of the MMPA, such deterrence does not constitute harassment, so there would be no significant impact to marine mammals. Therefore, implementation of Alternative 1 or Alternative 2 would not result in a significant health and safety impact relative to temporary relocation of the two bait barges.

For the reasons stated above (compliance with existing hazardous materials regulations, compliance with USCG nighttime vessel navigation rules/restrictions rules and use of Notices to Mariners, and deterrence of marine mammals to protect personal safety and minimize odors), implementation of Alternative 1 or Alternative 2 would not have a significant impact to public health and safety.

Under the No-Action Alternative, no demolition, construction, or dredging activities would occur. The Navy MMP would not be temporarily relocated to NMAWC and the Everingham Brothers Bait Company bait barges would not be temporarily relocated to one of the two proposed temporary relocation sites (Option 4A or 6A). Therefore, implementation of the No-Action Alternative would not have a significant impact to public health and safety.

Recreation. Demolition and construction would take place inside a navigation restricted zone that recreational vessels currently avoid (Figures 2-5 and 2-8a), so the majority of the project activities would not affect recreational navigation. Dredging is estimated to take 3 months. During this time, recreational boaters may need to detour around the dredge footprint; the temporary period when detours may be needed would not be a significant impact to recreational navigation.

The Everingham Brothers Bait Company barges would not anchor at the temporary location during the busiest recreational sailing period (summer), and most bait barge operations take place overnight when recreational boaters are not active. Certain sailboat race courses may choose to relocate their start/finish lines further to the west while the bait barges are at their temporary location. Potential temporary relocation site (Option 6A) was selected with consideration of recreational boating facilities. Therefore, implementation of Alternative 1 or Alternative 2 would not have a significant impact to recreation or recreational navigation.

Signs would be posted at SSTC beach and the La Playa beach, advising the public of the potential for sediment disposal and underwater noise to occur in those areas, respectively. The signs would alert beachgoers and swimmers at the SSTC beach of the potential for increased turbidity to occur while sediment is being disposed into the nearshore zone, about 1,200 ft from shore. At the La Playa beach, the signs would advise the public that during the project in-water construction period (September 16 through March 31) pile driving would occur at the project area that would generate underwater noise extending to the area offshore of the La Playa beach. With Alternative 1 or Alternative 2 there would be no beach closure, therefore, with implementation of Alternative 1 or Alternative 2 there would be no significant impact to recreation.

Under the No-Action Alternative, no demolition, construction, dredging, and sediment disposal activities would occur. The Everingham Brothers Bait Company bait barges would not be temporarily relocated to one of the two proposed temporary relocation sites (Option 4A or 6A). Therefore, implementation of the No-Action Alternative would not have a significant impact to recreation.

3.1 BIOLOGICAL RESOURCE HABITATS AND COMMUNITIES

3.1.1 Definition of Resource

Biological resource habitats of San Diego Bay are differentiated by location, elevation or depth, substrate, and by man-made or natural features, including the associated biotic communities. For purposes of this EA, the general biotic features of different habitats, including assemblages of plants and invertebrates, are included in this section, whereas separate sections are provided for fisheries (Section 3.2), birds (Section 3.3), marine mammals (Section 3.4), and threatened and endangered species (Section 3.5).

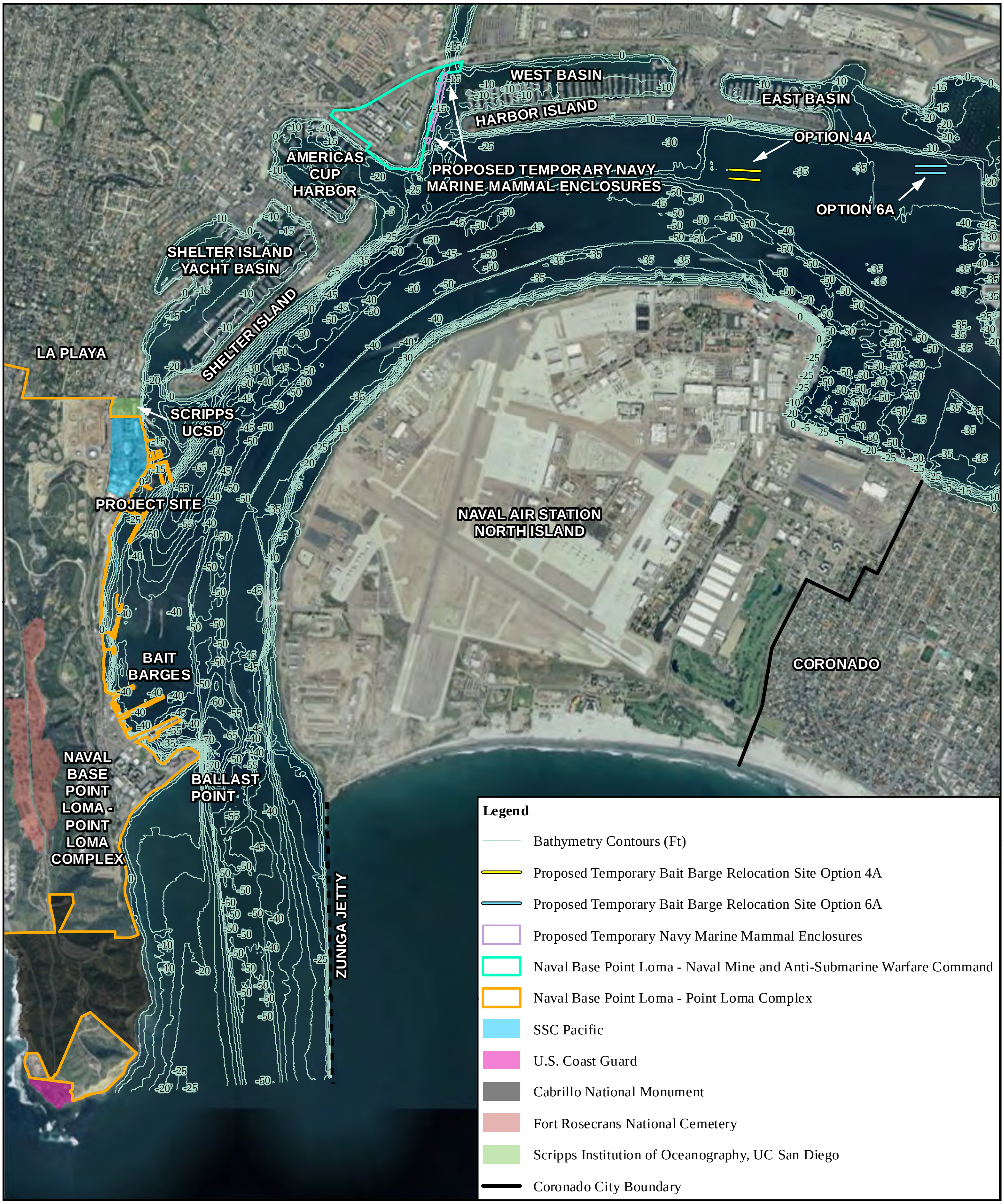
Habitats associated with the project area include an upland transition sandy beach; developed shoreline and artificial substrates such as the pier pilings and rock rip-rap; and marine benthic (bottom), water column, and open water habitats of varying depth as shown in Figure 3.1-1 (Merkel & Associates, Inc. 2009). Adjacent uplands include portions of the Point Loma Ecological Conservation Area (PLECA).

The marine habitats of the project area (seaward of the high tide line) are navigable waters of the U.S. under the Clean Water Act (CWA) (33 U.S. Code [USC] § 1344) and Rivers and Harbors Act (RHA) (33 USC § 403). Dredge and fill activities, as well as in-water work affecting the navigable waters, are regulated under these statutes by the USACE under Section 404 of the CWA and Section 10 of the RHA, respectively; regulations are at 33 CFR 320-330.

3.1.2 Affected Environment

This section is organized by habitat, with the exception that the proposed Navy marine mammal relocation site at NMAWC and the dredged material reuse site are discussed separately in concluding subsections. The description of existing conditions is based on the following references:

- The San Diego Bay Integrated Natural Resources Management Plan (INRMP) (NAVFAC Southwest 2000, NAVFAC Southwest and Port of San Diego 2011);
- The NBPL INRMP (NAVFAC Southwest 2002);
- The 2008 San Diego Bay Eelgrass Inventory and Bathymetry Update (Merkel & Associates, Inc. 2009);
- The 2010 Characterization of Essential Fish Habitat (EFH) in San Diego Bay (NAVFAC Southwest 2010);
- Fish surveys conducted in San Diego Bay during 1994-1999 by Allen *et al.* (2002) and during 2005 and 2008 by Pondella and associates (Vantuna Research Group 2006, 2009);
- SSTC Environmental Impact Statement (EIS) (NAVFAC Southwest 2011);
- Other documentation relevant to the SSTC beneficial reuse site prepared for the Opportunistic Beach Fill Program (City of Encinitas *et al.* 2008) and the San Diego Regional Beach Sand Project II (San Diego Association of Governments [SANDAG] and USACE 2011); and
- Site reconnaissance and other sources as cited.



0 0.25 0.5 Kilometers

0 0.25 0.5 Miles

Figure 3.1-1
Project Area Bathymetry

N

3.1.2.1 Coastal Upland

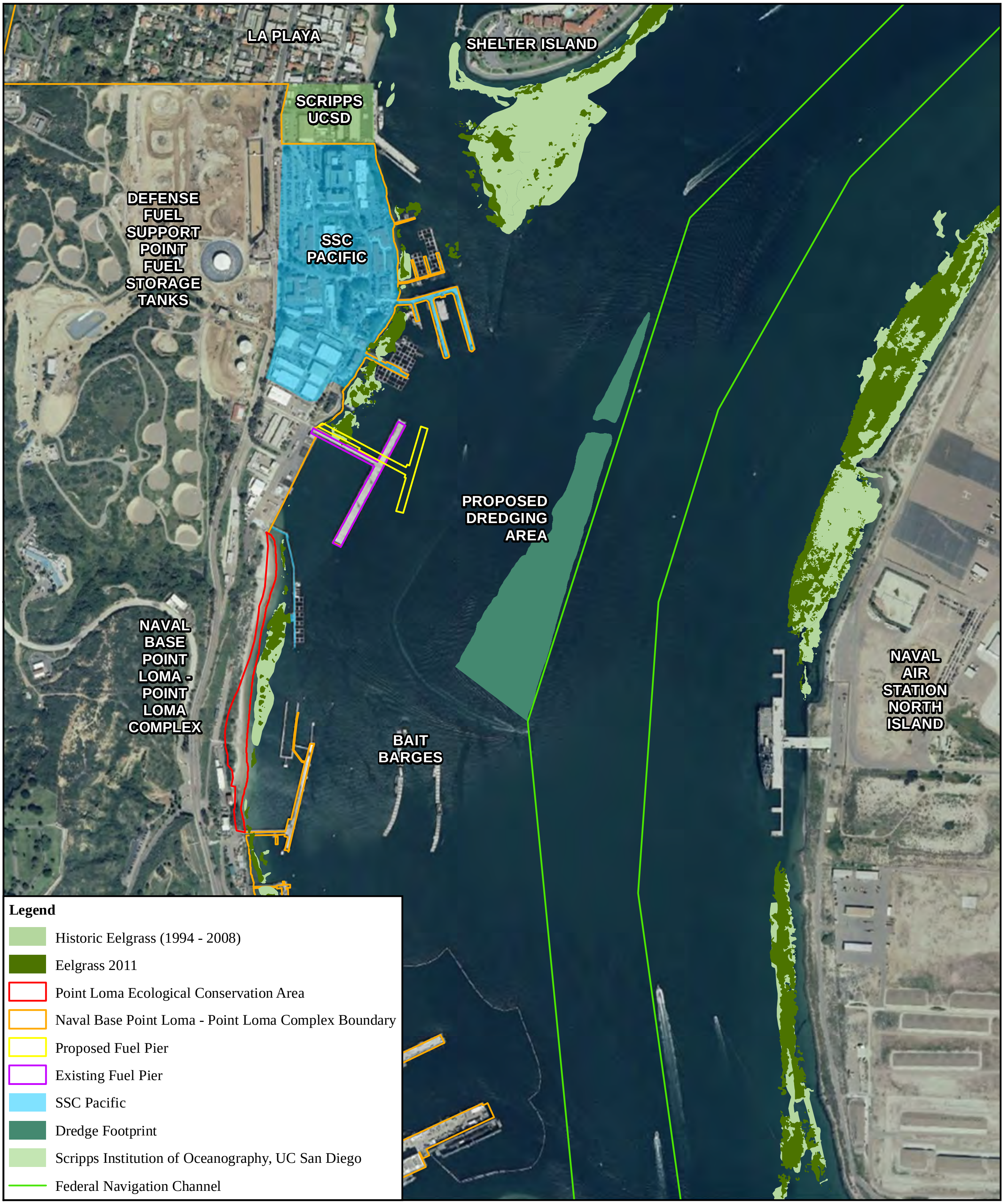
Inshore of the fuel pier and extending southward along the shore, the beach and adjacent strand/coastal scrub vegetation are part of the PLECA (Figure 3.1-2). This area would not be directly affected by proposed construction and demolition activities. The wandering saltmarsh skipper butterfly (*Panoquina errans*, a federal species of concern), coast horned lizard (*Phrynosoma coronatum*, a federal species of concern), San Diego blacktailed jackrabbit (*Lepus californicus*), Nuttall's lotus (*Lotus nuttallianus*, California Native Plant Society [CNPS] rank 1B.1), coast horned lark (*Eremophila alpestris*), red sand verbena (*Abronia maritima*, CNPS rank 4.2), and coast woolly-heads (*Nemacaulis denudata* var. *denudata*, CNPS rank 1B.2) all occur here (NAVFAC Southwest 1994; Tierra Data, Inc. [TDI] 2007; NAVFAC Southwest and Port of San Diego 2011). Otherwise, the coastal upland area surrounding the proposed project is a developed industrial site and does not offer habitat for native flora. Rosecrans Street, on the western border of the project area, is lined with exotic landscaping. Structures along the shoreline and surrounding open waters are heavily used by gulls, brown pelicans, cormorants, and surf scoters (*Melanitta perspicillata*) (NAVFAC Southwest 1994, 2000; TDI 2011).

3.1.2.2 Intertidal (+7.8 to -2.2 ft MLLW)

The shoreline of the affected environment consists of both man-made and natural features. Immediately north of the fuel pier's access way, the shoreline consists of concrete and rock riprap. A quay wall, approximately 12 ft above mean sea level, extends approximately 750 ft south of the fuel pier's access way. A sandy flat lies south of the quay wall, adjacent to one of the Navy marine mammal piers.

Despite its relatively small size, the intertidal zone has the greatest variability of any area in the bay, and this variability can occur within centimeters. This is due, at least in part, to the fact that the zone is exposed to air on a regular basis, and most physical factors show a wider range in air than in water. Organisms must adapt to extremes of temperature and desiccation, as well as salinity stress, mechanical wash, and backwash of waves. These extremes are more pronounced on sandy shores, where there is less animal life than on muddy shores. The abundance and diversity of fauna of a typical sand flat can also vary by orders of magnitude within and among years (NAVFAC Southwest and Port of San Diego 2011).

Artificial substrates, such as the pilings and bulkheads for the fuel pier, rock riprap, floating docks, seawalls, and mooring systems support a wealth of invertebrates and seaweeds. Invertebrates comprise a significant portion of the organisms present in the San Diego Bay and serve as important components of bay habitats and essential food sources for marine life. Invertebrate species diversity, abundance, and biomass of infaunal invertebrates in the north bay region is significantly higher than that of the south bay region, particularly in rock riprap when riprap niches are not filled with concrete (NAVFAC Southwest 2010). California spiny lobster (*Panulirus interruptus*) and a variety of crabs, worms, mussels, barnacles, echinoderms (sea stars and sea urchins), sponges, sea anemones, and tunicates (sea squirts) inhabit artificial structures (NAVFAC Southwest and Port of San Diego 2011).



0 100 200 Meters

0 350 700 Feet

N

Figure 3.1-2
Point Loma Ecological Conservation Area and Eelgrass Beds
in the Vicinity of the Proposed Fuel Pier

Sources: Navy 2007; NOAA 2012; NAVFAC Southwest 2011a, 2012

Since there are little to no natural hard surfaces in San Diego Bay, riprap and other artificial structures provide habitat that does not resemble any natural habitat in San Diego Bay. These structures provide microhabitats and support communities similar to those of natural rocky shores outside San Diego Bay. These areas may also provide refuge and feeding areas for juvenile and predatory fishes (NAVFAC Southwest and Port of San Diego 2011). Seventy-four percent (45.4 miles [mi]) of the shoreline of San Diego Bay is armored by man-made structures that protect developed sites (NAVFAC Southwest 2011).

Hardened shorelines can also provide elevated roosting sites for bay waterbirds, such as California brown pelicans (*Pelicanus occidentalis californicus*), cormorants, and gulls, which allow them to conserve energy and avoid harsh weather conditions. The surface roughness and complexity of a structure can affect its ability to provide refuge niches and allow water retention at low tides (NAVFAC Southwest and Port of San Diego 2011). The fuel pier covers 1.6 acres (ac) and is used for resting by waterbirds.

Sandy flats, such as the slim sand flat adjacent to the mammal enclosures south of the fuel pier, lack vegetation except for decomposing patches of washed-up algae or eelgrass. Beach hoppers, sand fleas, and isopods may be expected on the upper beach whereas polychaetes, clams, and other burrowing animals are prevalent on the lower beach. In intertidal areas, birds are more abundant and diverse on sandy flats than on rocky substrates (NAVFAC Southwest and Port of San Diego 2011).

3.1.2.3 Shallow Subtidal (-2.2 to -12 ft MLLW)

Vegetated shallow subtidal habitats are highly productive and important in San Diego Bay, in part due to the presence of eelgrass (*Zostera marina*) beds and algal mats on shallow sandy to muddy substrates in many areas of the bay (Merkel & Associates, Inc. 2009; NAVFAC Southwest 2000, 2002, 2011). Shallow soft-bottom areas, with their associated fauna and flora, were the primary subtidal habitat in San Diego Bay before its development (NAVFAC Southwest 2011). In the north bay, eelgrass grows at depths of 0 to -13 ft MLLW. Eelgrass is one of the few plants that inhabit this zone; its roots and rhizomes form an interlocking matrix that stabilizes the substrate and resists erosion. Near the mouth of San Diego Bay, a variant of eelgrass with wider blades grows from -16 to -23 ft MLLW (NAVFAC Southwest 2011). Eelgrass reduces water turbidity by trapping fine sediments and preventing their re-suspension, and its leaves cut down wave action and currents, further decreasing turbulence and causing more fine sediment to be deposited.

Due to their rapid growth rate and heterogeneous structure, eelgrass beds provide microhabitats for a wide variety of invertebrates and small fishes, primarily by increasing the available substrate surface and by providing effective refugia. Algae and invertebrates that grow on the leaf blades of eelgrass provide primary and secondary productivity for consumption by larval and juvenile fish. Fish produced from these beds are consumed by fish-eating birds, including the California least tern (*Sterna antillarum browni*). Waterfowl, especially surf scoter, scaup, and brant are present in high numbers in late fall and winter. Black brant, in particular, rely heavily on eelgrass of the central and south bay as they are one of the few birds that consume it directly (NAVFAC Southwest and Port of San Diego 2011).

Eelgrass is a Special Aquatic Site under Section 404 of the CWA (40 CFR § 230.3[q-1]). The deposition of dredged or fill material in Special Aquatic Sites is prohibited unless there is no other practicable alternative. Regarding EFH (Section 3.2 and Appendix E.1), eelgrass is also a Habitat Area of Particular Concern (HAPC). Although the analysis in Appendix E.1 illustrates Imperial Beach as the sediment beneficial reuse site, the site was later changed to the SSTC beach at Naval Amphibious Coronado (Figure 2-10). National Marine Fisheries Services (NMFS) concurs with the new location (see Appendix A). To mitigate impacts on eelgrass that cannot be avoided, the Navy has an approved mitigation bank comprising several eelgrass restoration sites in San Diego Bay (Appendix E.3).

Within and adjacent to San Diego Bay, there were 1,831 ac of eelgrass as of 2011 and an additional 868 ac of habitat that historically supported eelgrass. There were 0.05 ac of eelgrass at the proposed new fuel pier location as of 2011 and an additional 0.05 ac of habitat that historically supported eelgrass (Figure 3.1-2).

Infaunal benthic invertebrates are the most abundant invertebrate found in the soft bottom sediment of the Bay and include polychaete worms, crustaceans, mollusks, and unidentified species of oligochaete and nematode worms (USACE 2009, NAVFAC Southwest and Port of San Diego 2011). During the Bight 1998 survey (Bay *et al.* 2000), a total of 1,172 megabenthic invertebrates, representing 43 taxa, were collected in San Diego Bay. The nonindigenous bivalve *Musculista senhousia* was present in more than 70 percent of the samples, making it the most widely distributed trawl-caught invertebrate in the Bay. Other common invertebrates that were present in at least one-third of the samples included two undescribed species of sponge, the ascidian *Microcosmus squamiger*, the bivalve *Argopecten ventricosus*, and the gastropod *Crepidula onyx*. *Musculista senhousia,* together with another nonindigenous species *Microcosmus squamiger*, accounted for over 50 percent of the total catch (USACE 2009).

The base of the food chain for the benthic community in soft-bottom, unvegetated shallow subtidal habitat is provided by organic detritus that originates in shallower water and drifts or sinks into deeper water. Fauna residing in subtidal benthic habitats (across all depths) include the warty sea cucumber (*Parastichopus parvimensis*) and a diversity of infaunal species, such as suspension feeders, burrowers, and tube builders. Feeding by nematode and polychaete worms, clams, gastropod mollusks, brittlestars, crabs, isopods, and a wide variety of smaller crustaceans serves to transform detritus and small invertebrates into usable food for larger invertebrates and fishes. The soft bottom benthos provides other functional roles besides serving as a prey base for fish and birds. The less conspicuous mollusks, polychaete worms, small crustaceans, and other invertebrates living at the bottom of the bay mineralize organic wastes as it accumulates, consume algae, and return essential chemicals and organic matter to the water column (NAVFAC Southwest and Port of San Diego 2011).

The area immediately to the north of the fuel pier and around the small boat dock is largely a shallow subtidal zone (see Figure 3.1-1). Approximately half of this area is between 0 and -13 ft MLLW. Eelgrass occurs in this area and along the coast further north (see Figure 3.1-2) (Merkel & Associates, Inc. 2009). The proposed project's access way would be constructed in this area.

Eelgrass also occurs adjacent to the Navy marine mammal enclosures to the south. Large eelgrass beds also occur approximately 1,100 ft to the north of the proposed fuel pier, along the southern tip of Shelter Island, and 1,400 ft across the bay along the western edge of North Island (see Figure 3.1-2).

3.1.2.4 Moderately Deep Subtidal (-12 to -20 ft MLLW)

Nearly half of the area between the fuel pier and the quay wall/shoreline is moderately deep subtidal (see Figure 3.1-1). Approximately 2,219 ac (17 percent) of bay surface area falls into the moderately deep category, primarily in the south-central bay and in inlets of the north bay (NAVFAC Southwest and Port of San Diego 2011).

For both the moderately deep and deep subtidal (see below) habitats, primary production by phytoplankton and zooplankton occurs in the overlying water column. No information specific to this intermediate depth exists for invertebrates or plankton, although benthic primary production is limited due to low light penetration. As such, algal mats and eelgrass beds are lacking.

Typical fish species include round stingray (*Urobatis halleri*), spotted sand bass (*Paralabrax maculatofasciatus*), California halibut, and barred sand bass (*Paralabrax nebulifer*). The endangered California least tern (*Sterna antillarum browni*) forages in the project area as do many other diving waterbirds (NAVFAC Southwest 2010, NAVFAC Southwest and Port of San Diego 2011).

3.1.2.5 Deep Subtidal (>-20 ft MLLW)

Deep subtidal habitat includes the overlying surface water, water column, and sediments for areas greater than 20 ft (6 m) in depth, constituting about 4,440 ac (34 percent) of the bay surface area and is associated primarily with navigational channels (Figure 3.1-1). All of the project area on the east side of the fuel pier is deep subtidal, ranging from 30 to 73 ft deep. Approximately half of the area west of the southern portion of the fuel pier is also deep subtidal, ranging from 20 to 28 ft (6 to 9 m) deep; the shallowest deep subtidal area is adjacent to the quay wall (Figure 3.1-1). The current bait barge location, as well as both proposed temporary bait barge relocation options, are within deep subtidal habitat. All of the 10.6 ac proposed to be dredged occur in deep subtidal habitat.

The deep subtidal water column is home to phytoplankton and zooplankton, including species that spend their entire lives (holoplankton), or only a portion of their life cycle, e.g., as eggs, larvae, or juveniles (meroplankton), in the plankton. For the meroplankton, which includes many fish and invertebrates, an important function of the deep subtidal environment is transport into and out of the relatively warm, sheltered waters of the bay, which provide nursery habitats. The most common fish species found here are round stingray, spotted sand bass, and bat ray (*Myliobatis californica*) (NAVFAC Southwest and Port of San Diego 2011).

Diving birds, including the California least tern, forage in the open water and especially along the bay margins where schooling fish concentrate. Other common bird species include cormorants, grebes, the surf scoter (*Melanitta perspicillata*), the elegant tern (*Sterna elegans*), and other tern species.

3.1.2.6 Proposed Temporary Relocation of the Navy MMP

The marine environment at the proposed temporary Navy marine mammal relocation site is similar to that of the existing location. Like the present site, the relocation site at NMAWC is previously developed and located in the north bay. All surrounding upland areas are fully developed as buildings, parking lots, or manicured lawns with no remaining natural habitat. The proposed relocation site is also similar to the existing and proposed fuel pier location, with the exception that marinas typically have lower concentrations of piles and more light availability (NAVFAC Southwest 2010). Marinas 548 and 607 are used for recreational purposes (e.g., small sailboats). Navy Explosive Ordnance Disposal (EOD) Training and Evaluation Unit One uses Pier 619.

As of 2011, there was 0.67 ac of eelgrass and an additional 0.32 ac of habitat that historically supported eelgrass located within the proposed temporary Navy marine mammal enclosure relocation site (Figure 3.1-3). This area is also within designated least tern breeding habitat. The closest known sea lion haulout location is at navigational buoy Green 1, approximately 1,500 ft south of the proposed temporary Navy marine mammal enclosure relocation site.

3.1.2.7 Dredged Material Beneficial Reuse Site

The proposed beneficial reuse site at the SSTC is similar to but more homogeneously sandy and with less cobble than the Imperial Beach site that was evaluated in the Draft EA. The SSTC site consists of subtidal soft-bottom/sandy habitat that experiences seasonally varying low to moderate wave energy (NAVFAC Southwest 2011). The sediment composition of this area is similar to that of the proposed dredge site (Table 2-10). Cobble substrate exists in deeper water offshore, but there are no indications of kelp offshore or in the proposed disposal area (NAVFAC Southwest 2011) and kelp beds have not occurred historically in this area (North and MBC Applied Environmental Sciences 2001). Species typical of open-coast, sandy subtidal habitats are present and the biological community is dominated by filter- and deposit-feeding invertebrates and their predators (NAVFAC Southwest 2011).

3.1.3 Environmental Consequences

3.1.3.1 Approach to Analysis

The analysis identifies the potential significance of impacts to biological resource habitats and communities based on: 1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; 2) the proportion of the resource that would be affected relative to its occurrence in the region; 3) the sensitivity of the resource to proposed activities; and 4) the duration and ecological ramifications of the impact. For example, an impact would be considered significant if it would permanently reduce the population size or distribution of a protected species.

Figure 3.1-3
Eelgrass Beds in the Vicinity of the Proposed Temporary Navy Marine Mammal Enclosure Relocation Site

Sources: Navy 2007; NOAA 2012; NAVFAC Southwest 2011a, 2012

3.1.3.2 Avoidance and Minimization Measures

Before proceeding with the project, the Navy would obtain the required CWA Section 404/RHA Section 10 permits. All required terms and condition of the permits would be implemented. The following avoidance and minimization measures are proposed to be utilized during the proposed activities to reduce the potential impacts habitats and communities. Fisheries (Section 3.2), Birds (Section 3.3), Marine Mammals (Section 3.4), and Threatened and Endangered Species (Section 3.5) contain additional Avoidance and Minimization Measures applicable to those specific resources.

1) Sheet piling would be left in place to minimize sediment and eelgrass disturbance that would otherwise result from demolition activities.
2) In conjunction with a Caulerpa survey, a final pre-construction eelgrass survey would be conducted. Additionally, a post-construction eelgrass survey would be conducted and compared to both historical data and the pre-construction survey to determine the amount of eelgrass habitat permanently shaded, whichever is greater. This impact to eelgrass would be offset by using the Navy's established eelgrass mitigation bank. Temporary impacts at NMAWC would also be offset by the mitigation bank, but upon successful reestablishment of eelgrass within impacted areas at the NMAWC location, the bank would be credited for the reestablished acreage.
3) The contractor would use only clean construction materials suitable for use in the oceanic environment. The contractor would ensure no debris, soil, silt, sand, sawdust, rubbish, cement or concrete washings thereof, chemicals, oil, or petroleum products from construction would be allowed to enter into or placed where it may be washed by rainfall or runoff into waters of the U.S. Upon completion of the project authorized, any and all excess material or debris would be completely removed from the work area and disposed of in an appropriate upland site.
4) Spill kits and cleanup materials would be present during construction should there be a leak into the surrounding water.
5) All debris would be transported to, and disposed of, at an appropriate upland disposal site, or recycled if appropriate.
6) During project implementation, the Navy would regularly monitor construction activities to ensure that no deviation from the project as described herein are occurring. The Navy would report any violation of authorized impacts to NMFS within 24 hours of its occurrence.
7) The beach and adjacent strand/coastal scrub habitat inshore of the fuel pier and southward along the shore would not be used for any purpose.

3.1.3.3 Alternative 1 Pier Replacement and Associated Dredging

Pier demolition, pier construction, and turning basin dredging activities for Alternative 1 would cause minor and temporary impacts to existing vegetated and nonvegetated soft bottom benthic communities within the project area. Organisms occurring in the immediate area may be lost or displaced during demolition, construction, and dredging activities, either directly by equipment and noise associated with these activities or indirectly by exposure to temporary changes in suspended sediments, turbidity, dissolved oxygen, and light diffusion. As discussed in Section 3.7, *Hazardous Materials and Wastes*, resuspended sediments and associated high turbidity levels would decrease to background levels within a period of several hours after demolition or construction activities stop due to dilution and to particles settling and mixing. Potential impacts to plankton communities could include a localized decrease in primary productivity due to reduced photosynthesis. However, sediment resuspension, increased turbidity, or chemical changes would be limited to the areas of bottom disturbance and would persist for less than one hour following the disturbance. Therefore, the increased turbidity would not significantly impact benthic or water column habitats in the project area.

Pier demolition would impact benthic community resources (infauna and epifauna) by disturbing some organisms due to pile driving and removal. Some infaunal species (e.g., polychaete worms) and some epifaunal species (e.g., sea cucumbers) within the area would be disturbed or lost as a result of these activities, including pier piling epifauna (e.g., sea stars), due to pile removal. However, benthic species are expected to recolonize within a relatively short period of time from adjacent undisturbed areas, and new artificial structures would be available. Overall, the project would decrease the amount of bay shading by 5,315 square feet (sf)/0.12 ac, which represents less than 0.085 percent of the bay's 131 ac shaded by piers, docks, and marinas and 11 ac shaded by bridges (NAVFAC Southwest 2010). The amount of artificial habitat (pier pilings) would also be reduced. Pier demolition would have a low potential for mobilizing sediment contaminants into the water column; concrete, wood, steel, and plastic debris would be removed via barge cranes, then transported for recycling or disposed in a landfill. Therefore, implementation of Alternative 1 would not result in significant impacts to water quality or aquatic life due to pier demolition or construction.

The turning basin area to be dredged is, and would remain, deep subtidal habitat. As such, other than incrementally increasing the depth of the deep subtidal habitat, no permanent change would result from turning basin dredging. Any benthic flora within the immediate project area would be eliminated by the dredging activities because of site excavation and substrate removal. However, given the depths of dredging, no vegetation is expected to occur within the dredging footprint. Invertebrates within the dredging footprint would either be lost or relocated with the sediment and are expected to recover from the disturbance upon completion of dredging activities. Some of the lost invertebrates would likely be from mortality due to entrainment during the dredging process (Reine and Clark 1998). Any fish in the area should be capable of avoiding project equipment. Any impacts to marine algae and meioflora would be localized, minimal, and not significant. Dredged material would be moved to a previously permitted disposal site. Therefore, turning basin dredging may have some adverse, but less than significant, impacts to marine life.

A survey for the invasive alga *Caulerpa taxifolia* would be conducted before initiating in-water project activities, consistent with NMFS and California Department of Fish and Wildlife

(CDFW) requirements (NMFS 2008). If *Caulerpa taxifolia* is found in the study area during this survey, NMFS-approved *Caulerpa* Control Protocols would be followed. Therefore, Alternative 1 would not result in significant impacts to special aquatic sites due to *Caulerpa*.

Eelgrass is the only special aquatic site found in the project area. The nearest permanent eelgrass monitoring transect, North Bay (NB) 3, is approximately 490 ft southwest of the fuel pier, inshore of Pier F-122. Other nearby transects include NB4 on the south side of Shelter Island, approximately 1,540 ft northeast of the fuel pier, and NB2, on the opposite side of the harbor channel, approximately 3,020 ft to the east of the fuel pier. During development of the pier design, the pier alignment was positioned to minimize eelgrass disturbance. Similarly, sheet piling would be left in place to minimize sediment and eelgrass disturbance. However, not all eelgrass could be avoided, and approximately 0.05 ac of eelgrass surveyed in 2011, and an additional 0.05 ac of habitat that historically supported eelgrass, would be permanently shaded by construction of the new fuel pier. Eelgrass and additional habitat that historically supported eelgrass that would be shaded represent a tiny fraction of that which is found within and adjacent to San Diego Bay (0.0027 percent and 0.0058 percent, respectively). In conjunction with the *Caulerpa* survey, a final pre-construction eelgrass survey would be conducted. Additionally, a post-construction eelgrass survey would be conducted and compared to both historical data and the pre-construction survey to determine the amount of eelgrass habitat permanently shaded, whichever is greater. This impact to eelgrass would be offset by using the Navy's established eelgrass mitigation bank. Therefore, deconstruction of the fuel pier and construction of the proposed fuel pier would not result in significant impacts to marine plants and no significant effects to special aquatic sites would occur, and any loss would be applied against the established eelgrass mitigation bank.

Both proposed bait barge temporary relocation sites are located over deep subtidal habitat and would not shade any eelgrass. Therefore, the temporary relocation of the bait barges would not result in any impacts to habitats or communities.

The beach and adjacent strand/coastal scrub vegetation southward of the project site, which is also part of the PLECA, would not be used for any purpose. Therefore, implementation of Alternative 1 would not result in significant impacts to the PLECA, wandering skipper butterfly, or Nuttall's lotus. Similarly, neither upland nor shoreline habitat would be significantly impacted since all development that would occur is either on land previously developed or is within the marine environment. Therefore, implementation of Alternative 1 would not result in significant impacts to marine or terrestrial plants, habitats, or communities, including special aquatic sites.

<u>Proposed Temporary Relocation of the Navy MMP and the Navy Marine Mammal Enclosures</u>

Since the relocation of the marine mammal enclosures used for the Navy MMP is temporary, potential impacts resulting from such relocation would also be temporary. As stated in Section 3.1.2.6, Pier 619 and Marinas 548 and 607 are actively used. Furthermore, the surrounding upland area is fully developed with no remaining natural habitat and there is no designated critical habitat for any species in the project vicinity. The only HAPC is eelgrass (Figure 3.1-3), much of which is growing, or has previously grown, under the active pier and marinas. One permanent eelgrass monitoring transect, NB5, is located between Pier 619 and Marina 548 (NAVFAC Southwest 2008). Since the bottom of the Navy marine mammal enclosures consists of mesh and is not an opaque, solid structure, any eelgrass underlying the enclosures would be only partially shaded. Approximately 0.67 ac of eelgrass in 2011, and an additional 0.32 ac of habitat that historically supported eelgrass, would be partially shaded by the proposed temporary relocation of the Navy marine mammal enclosures. Temporary impacts at NMAWC would be offset by the Navy's established eelgrass mitigation bank, but upon successful reestablishment of eelgrass within impacted areas at the NMAWC location, the bank would be credited for the reestablished acreage. As such, the temporary relocation of the Navy MMP and the marine mammal enclosures would have no adverse effect on upland habitats or species, and impacts to marine habitats and species would be minor. Therefore, the temporary relocation of the Navy MMP and the marine mammal enclosures would not result in significant impacts to marine or terrestrial plants, habitats, or communities, including special aquatic sites.

Dredged Material Beneficial Reuse Site

The same conclusions apply to the SSTC site as were reached in the Draft EA for the Imperial Beach site. Sediment deposition at the beneficial reuse site would temporarily bury epifaunal/infaunal habitat and the associated organisms. The sediments would be similar in composition to and compatible with the naturally occurring sediments. Waves and currents would rapidly disperse the mound of deposited sediment, resulting in no long-term alteration of habitat conditions in the area of deposition. The inshore beach habitat would be enhanced by the addition of sand. The constituent species of the nearshore and beach environments are adapted to natural sand migration and episodes of burial/unburial, and are expected to locally redistribute in response to changes in depth such that no long-term effects on invertebrate or fish populations are expected (City of Encinitas *et al.* 2008, SANDAG and USACE 2011). No significant impact on habitats or communities would occur.

3.1.3.4 Alternative 2 Delayed Dredging Alternative

Alternative 2 would have the same impacts and the same avoidance and minimization measures as Alternative 1, although the impacts associated with dredging would occur separately from those associated with the other project components since the dredging would only take place after the new fuel pier construction was completed. Therefore, there would be no significant effects on biological resource habitats and communities as a result of Alternative 2.

3.1.3.5 Mitigation Measures

Because potential impacts to biological resource habitats and communities would be localized, would cease upon completion of project activities, and, with the implementation of avoidance and minimization measures described previously, would not be significant under either Alternative 1 or Alternative 2, no mitigation measures are proposed.

3.1.3.6 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, amendments to the existing navigation Security Zone, temporary relocation of the Everingham Bait Brothers Company bait barges, demolition and replacement of the existing fuel pier, and associated dredging of the turning basin would not occur and existing conditions would remain unchanged. Therefore, implementation of the No-Action Alternative would not have a significant impact on biological resource habitats and communities.

3.2 FISH

3.2.1 Definition of Resource

This section describes the fish species and their habitats that occur in the northern San Diego Bay project area. This section includes EFH as designated under the Magnuson-Stevens Fishery Conservation and Management Act (16 USC 1801).

3.2.2 Affected Environment

3.2.2.1 Fish Species

Numerous surveys have been conducted over the last few decades in the San Diego Bay region to quantify fish diversity and abundance; among the most comprehensive were surveys by Allen *et al.* (2002) and the Vantuna Research Group (2006, 2009). These and other works related to fish and EFH were characterized by Merkel & Associates, Inc. (NAVFAC Southwest 2010). Approximately 90 species of bottom living and open water fishes occur in the bay. There is a greater variety of fish species in the north bay area than in the south bay, and the greatest fish diversity can be found at artificial reefs. Increased levels of flushing found in the north bay also increases food availability, the supply of larval recruits, and water quality (NAVFAC Southwest 2010). Sandy floors and eelgrass have approximately two-thirds the species diversity of artificial reefs; piers and rock riprap have approximately one-half the fish diversity of artificial reefs. Marinas, launch ramps, and muddy bottoms have the least diversity of all areas in the north bay. The 10 most common fish species sampled in the north bay, each with over 500 individuals found between July 1994 and April 1999, make up approximately 98 percent of the total sample. These 10 fish species are:

- Northern anchovy (*Engraulis mordax*)
- Topsmelt (*Atherinops affinis*)
- Pacific sardine (*Sardinops sagax caeruleus*)
- Slough anchovy (*Anchoa delicatissima*)
- California grunion (*Leuresthes tenuis*)
- Shiner surfperch (*Cymatogaster aggregata*)
- Giant kelpfish (*Heterostichus rostratus*)
- Round stingray (*Urolophus halleri*)
- Bay pipefish (*Syngnathus leptorhynchus*)
- Cheekspot goby (*Ilypnus gilberti*)

The northern anchovy (62 percent) and topsmelt (22 percent) were the most abundant species. Additional fish species sampled with 100-500 individuals found, accounting for 1.5 percent of the total sample, include:

- Jacksmelt (*Atherinopsis californiensis*)
- Barred pipefish (*Syngnathus auliscus*)

- California halibut (*Paralichtyhys californicus*)
- Barred sand bass (*Paralabrax nebulifer*)
- Black surfperch (*Embiotoca jacksoni*)
- Kelp bass (*Paralabrax clathratus*)
- Dwarf surfperch (*Micrometrus minimus*)
- Spotted sand bass (*Paralabrax maculatofasciatus*)
- Queenfish (*Seriphus politus*)
- Bay blenny (*Hypsoblennius gentilis*)
- Spotted turbot (*Pleuronichthys ritteri*)

Just below the quay wall immediately south of the fuel pier access way, the water is approximately 10 to 14 ft deep; the depth increases to as much as 28 ft near the southern portion of the fuel pier. Water depth north of the fuel pier access way ranges from 0 ft along the rock riprap to as much as 16 ft near the northern portion of the fuel pier. The nearshore habitat along the seawall and rock riprap is expected to contain marine algae, invertebrates, and fish species typically associated with shoreline to deep subtidal habitats. Based on Allen *et al.* (2002), areas extending out from the seawall that are deeper than -18 ft MLLW are likely to contain:

- Dungeness crab (*Cancer magister*)
- Pacific rock crab (*Cancer anternnarius*)
- Red tube worm (*Surpula vermicularis*)
- Giant green anemone (*Anthopleura xanthogrammica*)

Typical fish species expected to be found in and around shallow water intertidal habitats include:

- Juvenile northern anchovy (*Engraulis mordax*)
- Pacific sardine (*Sardinops sagax*)
- California grunion (*Leuresthes tenuis*)
- Shiner surfperch (*Cymatogaster aggregata*)
- Round stingray (*Urolophus halleri*)
- Spotted sand bass (*Paralabrax maculatofasciatus*)
- Bat ray (*Myliobatis californica*)
- Topsmelt (*Atherinops affinis*)

Eelgrass beds, such as those that occur within the project area, are recognized as nursery habitat for many species. Typical fish species associated with eelgrass and subtidal unvegetated habitats include shiner surfperch, black surfperch, spotted kelpfish (*Gibbonsia elegans*), giant kelpfish, Pacific seahorse (*Hypocampus ingens*), bay blenny, dwarf surfperch, kelp bass, reef finspot (*Paraclinus integripinnis*), barred pipefish and bay pipefish. Although density and abundance of infaunal species are usually considerably higher in eelgrass beds than in unvegetated soft bottom habitats (NAVFAC Southwest 2000), Merkel & Associates, Inc. found the greatest abundance of infaunal species in the north bay among rock riprap (NAVFAC Southwest 2010).

Fish associated with deep subtidal habitats include California horned shark (*Heterodontus francisi*), shovelnose guitarfish (*Mustelus californicus*), bat ray, round stingray, Pacific sardine, northern anchovy, slough anchovy, jacksmelt, topsmelt, pipefish, basses, croakers, surfperches, Pacific mackerel (*Scomber japonicus*), and turbots (NAVFAC Southwest 2000).

While there is no commercial fishing within the bay, at least 15 fish species inhabiting the bay support commercial or recreational fisheries elsewhere in southern California waters. Examples of notable fishery populations found in the bay include California halibut and white seabass (*Atractoscion nobilis*) (Vantuna Research Group 2009). At least 58 species are involved in the recreational catch (NAVFAC Southwest 2011).

Fishes typical of southern California surf zone and shallow sandy habitats are expected at the SSTC reuse site, including small, active planktivores (e.g., anchovies, sardines, jacksmelt, queenfish); roving substratum feeders, especially croakers (Sciaenidae); benthic flatfishes (e.g., sanddab [*Citharichthy stigmaeus*] California halibut); beach spawners (California grunion); and piscivores (e.g., barred sand bass, sharks) (Allen and Pondella 2006).

3.2.2.2 Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) set forth the EFH provisions to identify and protect important habitats of federally managed marine and anadromous fish species. Section 305(b)(2) of the amended Magnuson-Stevens Act directs each Federal Agency to consult with the NMFS with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any EFH identified under the Magnuson-Stevens Act. Implementing regulations for this requirement are at 50 CFR 600. Because the project area is located within an area designated as EFH for two Fishery Management Plans (FMPs) – the Pacific Coast Groundfish (Pacific Fishery Management Council [PFMC] 2011) and the Coastal Pelagic Species (PFMC 1998a) – and may adversely affect EFH, the U.S. Navy is required to consult with NMFS. As such, a complete, written assessment of the effects of the Proposed Action on EFH is provided in Appendix E.1 and is summarized in this EA.

The Pacific Coast Groundfish FMP manages at least 89 species, 5 of which are likely to occur within the San Diego Bay project area (NAVFAC Southwest 2000; Allen *et al.* 2002; Vantuna Research Group 2006, 2009; PFMC 2011), and the FMP for Coastal Pelagic Species includes five species, four of which are likely to occur in the San Diego Bay project area (PFMC 1998a). These species are listed in Table 3.2-1; additional details, such as life histories, are provided in Appendix E.1. Coastal pelagic species are those fish that live in the water column, from the surface to -3,300 ft MLLW. Although groundfish species are considered demersal and generally live on or near the sea floor, they occupy diverse habitats at all stages in their life histories.

Table 3.2-1. Fish Species with EFH Likely to Occur in the Proposed San Diego Bay Project Area

Common Name	*Scientific Name*
Coastal Pelagics	
Northern anchovy	*Engraulis mordax*
Pacific sardine	*Sardinops sagax*
Jack mackerel	*Trachurus symmetricus*
Pacific mackerel	*Scomber japonicas*
Groundfish	
Curlfin sole	*Pleuronichthys decurrens*
English sole	*Pleuronichthys vetulus*
California scorpionfish	*Scorpaena guttata*
Grass Rockfish	*Sebastes rastrelliger*
Leopard shark	*Triakis semifasciata*

In terms of EFH, the proposed SSTC reuse site is essentially the same as the Imperial Beach site evaluated in the Draft EA and in the EFH Assessment (Appendix E.1), although the SSTC site is more homogeneously sandy and has less cobble. As compared to the San Diego Bay project area, the same Coastal Pelagic Species are expected, whereas a larger number of managed groundfish species, especially rockfish and skates, occur and have EFH, in the sediment disposal/beneficial reuse area at the SSTC (Appendix E.1; NAVFAC Southwest 2011a). The bait barge relocation sites are the in the same (deep subtidal) habitat as the existing location of the barges.

EFH that is considered to be particularly important to the long-term productivity of populations of one or more managed species, or to be particularly vulnerable to degradation, may also be identified by NMFS as HAPCs. HAPCs may include high value intertidal and estuarine habitats, offshore areas of high habitat value or vertical relief, and habitats used for migration, spawning and rearing of fish and shellfish. The Pacific Coast Groundfish FMP identifies several HAPCs (PFMC 2011), one of which, seagrass, occurs within the project area due to the presence of eelgrass (Merkel & Associates, Inc. 2009; NAVFAC Southwest 2012).

3.2.2.3 Vessel Traffic and the Ambient Underwater Soundscape

As illustrated by Table 3.2-2, San Diego Bay is heavily used by commercial, recreational, and military vessels, with an average of 82,413 vessel movements (in or out of the bay) per year. This equates to about 225 vessel transits per day, a majority of which are presumed to occur during daylight hours. The number of transits does not include the estimated 200,000 recreational boaters that use San Diego Bay (San Diego Harbor Safety Committee 2009).

Table 3.2-2. Port of San Diego Average Annual Vessel Traffic

Vessel Type	**Vessel Movements (Inbound And Outbound)**		
	Subtotal by Vessel Type		*Total*
	Cargo	*Others*	
Total Annual Movements for All Vessel Types			**82,413**
Deep Draft Commercial Vessel (Cargo plus Cruise)			1,175
Cargo Ships (largest vessel: 1,000 ft length, 106 ft beam, 41 ft draft)		740	
Bulk	20		
Container Ships	100		
General Cargo	180		
Roll On/Roll Off	440		
Cruise Ships (largest vessel: 1,000 ft length, 106 ft beam, 34 ft draft)		435	
Excursion Ships (largest vessel: 222 ft length, 57 ft beam, 6 ft draft)		68,000	68,000
Commercial Sportfishing (average vessel size: 123 ft length, 32 ft berth, 13 ft draft)		10,094	10,094
Military (largest vessel: 1,115 ft length, 252 ft beam (flight deck), 39 ft draft)		3,144	3,144

Note: Tug traffic was not included in the above statistics since inner harbor tug movements alone exceed 7,000 for a typical year.

Source: San Diego Harbor Safety Committee 2009.

Based on acoustic monitoring of ship noise in Glacier Bay, Alaska (Kipple and Gabriele 2007), sound source levels from a variety of vessel types and sizes are typically within the range of 160-170 decibels (dB) at 1 m. Ship noise occurs over a broad frequency range (roughly 100 hertz [Hz] to 35 kilohertz [kHz]), with peak noise at higher frequency for smaller vessels. Ship noise thus has the potential to obscure underwater sound that would otherwise emanate from the project site to locations farther up the bay or offshore through the mouth.

In the project area, extensive measurements were made of underwater noise levels during and April and June 2012 (Appendix E.5). Mean and median values were predominantly in the range of 120-130 dB referenced at 1 microPascal (abbreviated as re 1μPa), with substantially higher intermittent sound in excess of 150 dB re 1μPa due to passing ships, and sound energy concentrated between 100 Hz and 2 kHz, broadly overlapping the peak frequencies expected for pile driving.

3.2.3 Environmental Consequences

3.2.3.1 Approach to Analysis

The analysis identifies the potential significance of impacts to fisheries based on: 1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; 2) the proportion of the resource that would be affected relative to its occurrence in the region; 3) the sensitivity of the resource to proposed activities; and 4) the duration and ecological ramifications of the impact. For example, an impact would be considered significant if it would permanently reduce the population size or distribution of a protected species.

Impacts to fisheries associated with Alternative 1 or Alternative 2 would be primarily from increased underwater noise and turbidity associated with demolition of the fuel pier, construction of the new fuel pier, and dredging of the turning basin. No impacts to fish associated with the movement of the bait barges between the existing and either proposed relocation site would occur. For pile driving and extraction associated with fuel pier construction, as well as pile driving at the proposed temporary Navy MMP relocation site, the Navy worked with researchers from the University of Washington to develop a rigorous model of underwater transmission loss, taking into account site-specific bathymetry and shoreline characteristics. The model's description, the duration of the activities upon which the model is based, and the model's results (predicted underwater sound contours) are summarized below. Additional details related to the analysis are provided in Appendix E.1, and Section 3.2.3.3 discusses the predicted impacts to fish based on this model.

Duration of Activities

In conjunction with MMPA compliance (Section 3.4), proposed in-water construction and demolition work has been broken down into three consecutive 1-year periods, beginning on 30 September 2013. The planned activities and their durations during each year are summarized below.

Year 1

Pile Driving. No work would begin on the Proposed Action until all required permits and approvals are in place. A total of 554 piles would be installed for the new pier (see Table 2-7). For the temporary facilities for the Navy MMP at NMAWC, 13 12-inch square and 19 16-inch diameter existing piles would be removed and repositioned; 46 new 16-inch diameter concrete piles would be installed as well. At both locations, pile driving would occur only during daylight hours, nominally 7:00 A.M. to 4:00 P.M, Monday through Friday.

It is assumed that the contractor will drive approximately two steel piles per day, and five concrete or fiberglass piles per day. Each pile is assumed to require up to 2 hours of driving. Steel piles would be driven initially with a vibratory pile driver, and then finished as necessary with an impact pile driver. Working assumptions are 1-1.5 hours of vibratory pile driving and up to 0.5 hour of impact pile driving for each steel pile. Concrete and fiberglass piles would be jetted, then driven with an impact pile driver only; sound levels are much lower for these types of piles.

The currently proposed construction schedule includes the following non-overlapping, consecutive episodes of pile driving:

- Removal and repositioning of 13 12--inch (in) square and 19 16-inch diameter concrete piles, as well as installation of 46 new16-inch diameter concrete pile to support the relocated facilities of the Navy MMP to NMAWC. Pile driving is estimated to occur over an 8-week period.
- Installation of steel indicator piles to occur over 17 days.
- Installation of steel temporary dolphin piles to occur over 5 days.
- Installation of 24 steel abutment piles to occur over 13 days.
- Installation of approximately 26 steel structural piles over 15 days.

Steel piles are assumed to be a mix of 36- and 48-in diameter. As noted above, pile driving would likely occur on only a few hours of each day.

Pile Extraction. Pile removal and driving at NMAWC is estimated to occur over an 8-week period. Demolition of the existing pier would occur at the rate of approximately five piles per day. Demolition of the north segment of the existing pier is scheduled to occur within the period of this Proposed Activity. There are no steel piles in the north segment; only 12-in timber piles, 18- and 24-in square concrete piles, and 13-in diameter plastic piles. Demolition of the north segment of the pier is scheduled to occur in 2014. That activity is estimated to require 84 days, with approximately one-fourth of the effort involving pile removal, a portion of which may involve the use of a vibratory extractor. For this analysis, it is assumed that vibratory pile extraction could occur on up to 21 days.

Year 2

Pile Driving. During the second year of construction, there would be several non-overlapping episodes of pile driving, including:

- Steel structural piles for the access pier, 45 days
- Fiberglass-concrete secondary fender piles for the access pier, 10 days. Since this would occur in the same timeframe as concrete pile driving (see below), which generates louder sound, this source does not need to be modeled.
- Steel structural piles, 45 days
- Steel mooring dolphin piles, 12 days
- Concrete primary fender piles, 15 days

Pile Extraction. No in-water demolition activities are scheduled during year 2.

Year 3

Pile Driving. During the third year of construction, there would be several episodes of pile driving, including:

- Concrete primary fender piles, 15 days
- Fiberglass-concrete secondary fender piles, 12 days

- Steel mooring dolphin piles, 12 days
- Steel abutment piles, 10 days

The abutment piles and mooring dolphin piles would be driven within the same timeframe, over a combined 12-day period.

Pile Extraction. Demolition of the remaining structure is estimated to require 154 days, with vibratory extraction occurring on approximately one-fourth of those days (39 days). It is assumed that removal of the 24 concrete-filled steel piles would require vibratory extraction on 6 of the 39 days.

<u>Underwater Sound Model Description</u>

Underwater sound levels received at a given distance from an acoustic source such as pile driving are a function of the source level and transmission loss (TL). Empirically measured source levels from similar pile driving events were used to estimate pile driving sound source levels for this project. TL underwater is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for TL is:

TL = B * log10(R) + C * R, where

B = logarithmic (predominantly spreading) loss

C = linear (scattering and absorption) loss

R = ratio of receiver distance to source reference distance (usually 1 m or 10 m)

As widely used in the evaluation of underwater sound from pile driving, linear loss (C) is assumed equal to zero, and "practical spreading" (B=15) is assumed, resulting in the formula for transmission loss is TL = 15 * log10(R). For this analysis, however, a site-specific model was developed for TL from pile driving at a central point at the project site. The model is based on historical temperature-salinity data and location-dependent bathymetry. The model's predictions result in a slightly lower average rate of TL than practical spreading, and hence are conservative. For pile driving at the Navy MMP relocation site (NMAWC), no site-specific modeling was conducted, and practical spreading loss is assumed.

To estimate the sound exposure level (SEL) to which a fish at a given location would be exposed through multiple hammer strikes, a simple summation procedure is used where total SEL = Single Strike SEL + 10log (number of strikes), with a maximum of 100 repeat strikes per pile and 2 piles per day.

<u>Model Results</u>

The results of the model, predicted sound "contours" emanating from different sources, are shown in Figures 3.2-1 through 3.2-7. The figures reflect the conventional assumption of a "sound shadow" effect, wherein sound transmission from the source is truncated and not reflected where it intercepts a shoreline or structure. Although the influence of Zuniga Jetty was not modeled, it is reasonable to assume that project sound would not propagate east of the jetty (Dahl 2012). Hence, the projection of sound through the mouth of the bay into the open ocean would be truncated along the jetty and narrower in reality than shown in the figures.

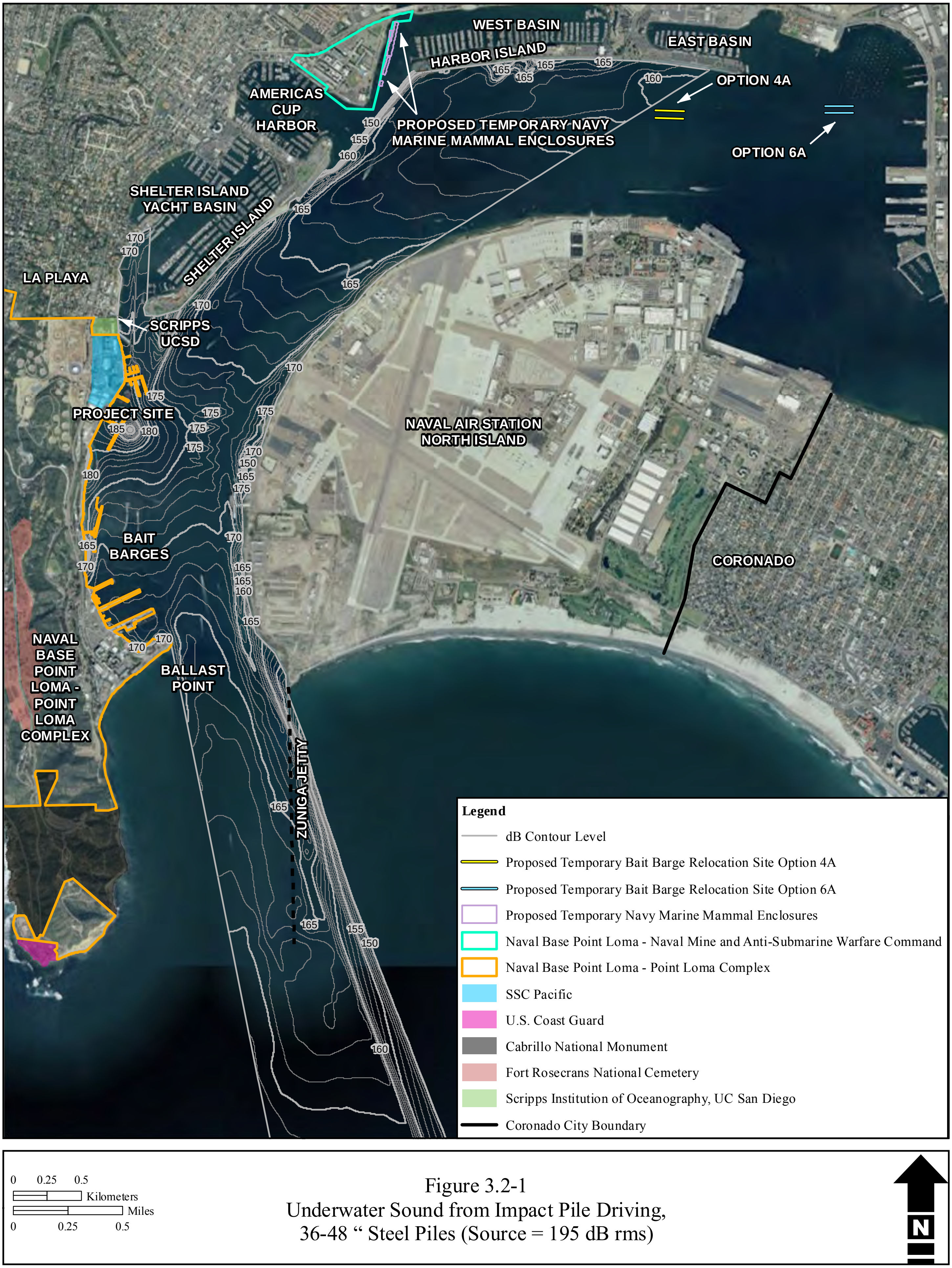


Figure 3.2-1
Underwater Sound from Impact Pile Driving,
36-48 " Steel Piles (Source = 195 dB rms)

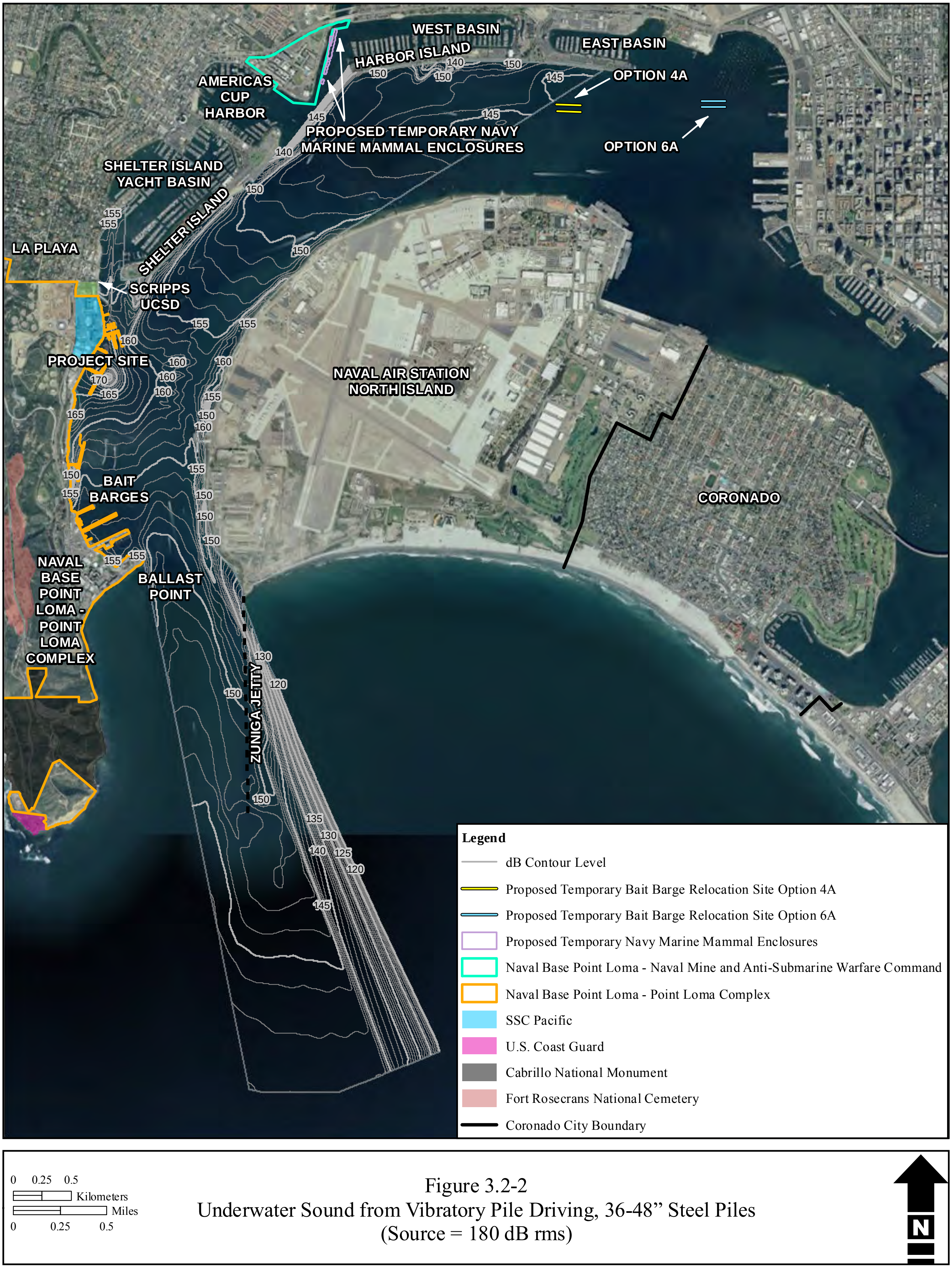


Figure 3.2-2
Underwater Sound from Vibratory Pile Driving, 36-48” Steel Piles
(Source = 180 dB rms)

Figure 3.2-3
Underwater Sound from Impact Pile Driving,
24” Concrete Piles (Source = 176 dB rms)

Figure 3.2-4
Underwater Sound from Impact Pile Driving,
16” Fiberglass-Concrete Piles (Source = 173 dB rms)

Figure 3.2-5
Underwater Sound from Impact Pile Driving at Marine Mammal Relocation Site, 18" Concrete Piles (Source = 173 dB rms)

Figure 3.2-6
Underwater Sound from Vibratory Steel Pile Extraction
(Source = 172 dB rms)

0 0.25 0.5 Kilometers
0 0.25 0.5 Miles

N

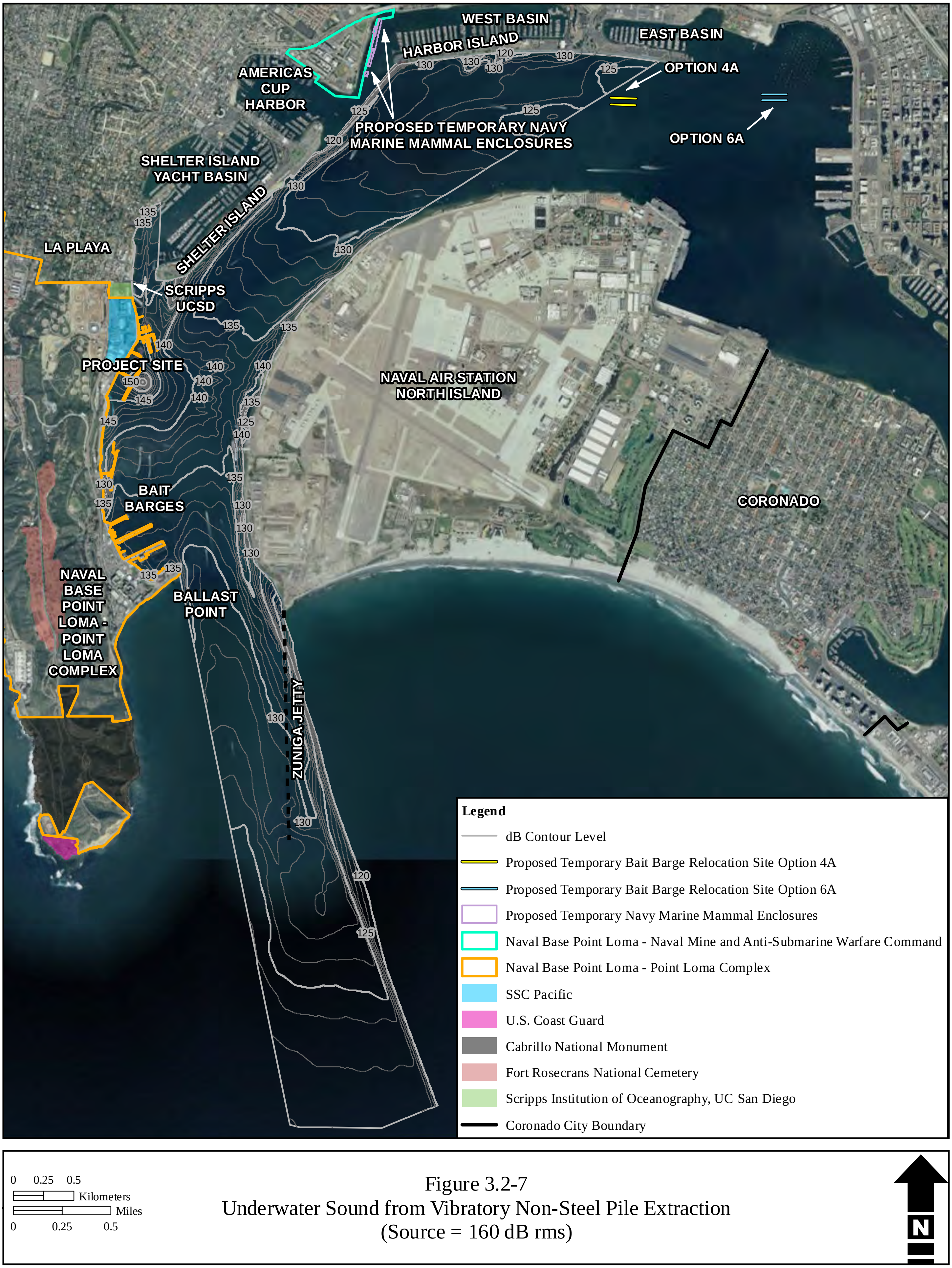


Figure 3.2-7
Underwater Sound from Vibratory Non-Steel Pile Extraction
(Source = 160 dB rms)

Seaward of the entrance to the bay, underwater noise from vessels moving into and out of the bay would presumably fill in and dominate the underwater soundscape across the frequency range of pile driving, masking sound that is of lesser amplitude than typical vessel noise of 150-160 dB (Kipple and Gabrielle 2007). As such, the extension of the model 4-5 kilometers (km) south of the entrance is considered sufficient to cover all scenarios in which fish or marine mammals might reasonably be expected to respond to sound from pile driving or extraction.

3.2.3.2 Avoidance and Minimization Measures

Avoidance and minimization measures integrated into the project design pertaining to Fisheries and EFH include the following:

1) Sheet piling would be left in place to minimize sediment and eelgrass disturbance.
2) In conjunction with a Caulerpa survey, a final pre-construction eelgrass survey would be conducted. Additionally, a post-construction eelgrass survey would be conducted and compared to both historical data and the pre-construction survey to determine the amount of eelgrass habitat permanently shaded, whichever is greater. This impact to eelgrass would be offset by using the Navy's established eelgrass mitigation bank. Temporary impacts at NMAWC would also be offset by the mitigation bank, but upon successful reestablishment of eelgrass within impacted areas at the NMAWC location, the bank would be credited for the reestablished acreage.
3) The contractor would use only clean construction materials suitable for use in the oceanic environment. The contractor would ensure no debris, soil, silt, sand, sawdust, rubbish, cement or concrete washings thereof, chemicals, oil, or petroleum products from construction would be allowed to enter into or placed where it may be washed by rainfall or runoff into waters of the U.S. Upon completion of the project authorized, any and all excess material or debris would be completely removed from the work area and disposed of in an appropriate upland site.
4) Spill kits and cleanup materials would be present during construction should there be a leak into the surrounding water.
5) During project implementation, the Navy would regularly monitor construction activities to ensure that no deviations from the project as described herein are occurring. The Navy would report any violation of authorized impacts to NMFS within 24 hours of its occurrence.

The following avoidance and minimization measure would be implemented during the proposed pile driving and dredging activities.

1) Prior to the start of pile driving or dredging each day, after each break of more than 30 minutes, and if any increase in the intensity is required, the Navy would use a ramp-up procedure. The procedure involves a slow increase in the pile driving to allow animals in the area to disperse.

3.2.3.3 Alternative 1 Pier Replacement and Associated Dredging

The primary impacts to fish communities and habitats in the project vicinity would be from pile installation and removal, which would result in increased underwater noise. Since many fish use their swim bladders for buoyancy, they are susceptible to rapid expansion/decompression due to peak pressure waves from underwater noises (Hastings and Popper 2005). At a sufficient level, this exposure can be fatal. In 2008, NOAA Fisheries, U.S. Fish and Wildlife Service (USFWS), CDFW, and transportation agencies of California, Oregon, and Washington agreed in principle to assess project effects using Interim Criteria for Injury to Fish from Pile Driving Activities (Fisheries Hydroacoustics Working Group 2008). These interim criteria are provided in Table 3.2-3. The criteria were developed principally for endangered salmonids in the Northwest and are conservative, indicating the potential for the identified effect, rather than a likelihood of occurrence (Popper and Hastings 2009, Halverson *et al.* 2011). The Navy has not adopted these criteria.

Table 3.2-3. Interim Criteria for Fish Injury and Disturbance by Underwater Sound from Pile Driving

Effect	*Size of Fish*	*Underwater Impact Pile Driving Criteria*	*Underwater Vibratory Pile Driving Criteria*
Onset of Injury	All fish	206 dB peak re: 1μPa	N/A
	≥ 2 grams	187 dB SEL re: 1μPa^{2}sec	N/A
	< 2 grams	183 dB SEL re: 1μPa^{2}sec	N/A
Behavioral Impacts	All fish	150 dB rms re: 1μPa	150 dB rms re: 1μPa

Note: N/A = not available; rms = root mean square; SEL = sound exposure level.

Transmission losses based on the model or practical spreading were calculated and mapped with geographic information system Geographic Information System (GIS) data, resulting in the underwater sound contours provided above (Figures 3.2-1 through 3.2-7). Zones of Influence (ZOIs) corresponding to the interim criteria were then calculated for each of the project underwater sound sources (Table 3.2-4). The table also provides the maximum number of days per year for each activity and corresponding ZOI. In general, areas of potential injury are small and limited to the immediate area of pile driving, whereas the areas of potential behavioral effects, particularly for steel pile installation are relatively large, up to 10.8 square kilometers (km^2). The 206 dB injury threshold would only be exceeded during impact installation of the steel piles, and only encompassing 0.0022 km^2, within about 26 m of the pile driver. It is unlikely that fish would remain this close to the pile being driven after the ramp-up period. The areas encompassing the weight-based criteria for potential injury are somewhat larger (Table 3.2-4), but there is little evidence for injurious effects to fish at these SELs (Popper and Hastings 2009, California Department of Transportation [Caltrans] 2010, Halverson *et al.* 2011).

Since the relocation of the marine mammal enclosures used for the Navy MMP is temporary, potential impacts to fish resulting from such relocation would also be temporary. Fish up to a distance of 341 m from the pile driving location may be disturbed by underwater sound in excess of 150 dB, but the areas of potential injurious effects are very small (Table 3.2-4 and Figure 3.2-5), and fish would be expected to disperse away from or avoid the area during pile driving rather than remain stationary and risk injury. Therefore, there would be no adverse effect from sound levels on fisheries or EFH under the Magnuson-Stevens Act from the temporary relocation of the Navy marine mammal enclosures to Pier 619 and Marinas 548 and 607.

Fish species occurring in the immediate areas identified could also be displaced during project activities indirectly by temporary changes in suspended sediments, turbidity, dissolved oxygen, and changes in light diffusion. However, fish present during project activities should be capable of avoiding project equipment and areas affected by increased turbidity and increased noise from pile driving, concrete removal, and turning basin dredging. Furthermore, most if not all of the fish species occurring in the area routinely experience turbid and noisy conditions due to natural processes and ship traffic within the bay.

Table 3.2-4. Calculated ZOIs Corresponding to Interim Criteria for Fish

Description	*Area of Potential ZOI (km²)*						
	Source, dB peak @ 10m	*Source, dB rms @ 10m*	*Source, dB SEL @ 10m*	*All Fish Injury – 206 dB peak*	*Fish ≥2g Injury – 187 dB SEL*	*Fish < 2g Injury - 183 dB SEL*	*All Fish Behavior 150 dB rms*
Impact driving steel piles	210	195	180	0.0022	0.1949	0.5718	10.8251
Vibratory driving steel piles	195	180	180	N/A	N/A	N/A	4.0519
Impact driving 24-in concrete piles	188	176	166	0	0.0010	0.0052	2.3583
Impact driving 16-in concrete-fiberglass piles	184	173	163	0	0.0003	0.0014	1.3123
Impact driving 18-in concrete piles at marine mammal relocation site	184	173	163	0	0.0002	0.0008	0.2397
Vibratory extraction – steel piles	180	172	172	N/A	N/A	N/A	1.0240
Vibratory extraction – non-steel piles	170	160	160	N/A	N/A	N/A	0.0240

Notes: All sound levels expressed in dB re 1 µPa rms. dB = decibel; in = inch; N/A = not applicable; rms = root-mean-square; µPa = micropascal pile driving sound sources based on Caltrans 2009; Washington State Department of Transportation (WSDOT) 2010, 2012; NMFS 2010. SELs for fish injury were calculated by assuming 200 hammer strikes per day.

Typically, environmental assessments for San Diego Bay projects have considered the addition of hard substrate an environmental benefit to fishes because the attached fouling community serves as forage for fish. As such, the reduction of hard substrate that would result from implementation of Alternative 1 could be considered an adverse effect. However, such a reduction would represent a minor portion of the artificial hard substrate found within the bay and would not result in a significant impact. Furthermore, any adverse impact from artificial hard substrate reduction would be offset by the beneficial effect resulting from the decrease in pier shading and the corresponding increase in light availability.

Dredging would result in the behavioral displacement of bottom-dwelling invertebrates and fish as well as their removal (and likely mortality) by entrainment in the dredge (Reine and Clarke 1998). The fish species most common and likely to be affected include rays and flatfishes (NAVFAC Southwest 2010). The proposed dredging area comprises about 10 ac, which is roughly 0.25 percent of the deep subtidal habitat in San Diego Bay (TDI 2011). The effects on habitat as well as species' populations would be minimal in terms of percentages affected, and temporary as fish would recolonize the area following the cessation of disturbance. Similar conclusions were reached by the USACE and regulatory agencies in review of the much larger San Diego Harbor Maintenance Dredging Project (USACE 2012), which is contiguous with the proposed fuel pier dredging.

Greater potential for turbidity impacts would exist if there were substantial amounts of fine sediments and organisms in the potential dredging area. However, testing of samples of material to be dredged indicated that grain sizes are predominately of coarser beach compatible grain sands, which is consistent with areas that consistently generate currents during tidal flushing (NAVFAC Southwest 2010). This material settles quickly instead of remaining suspended in the water column. On the beneficial side, dredging could increase water circulation, indirectly benefit fish resources, and dredging activities can suspend infauna and epifauna to temporarily enhance fish feeding activities. However, any such changes would be negligible given that the boundaries, bathymetry, configuration, and use of the piers would remain essentially unchanged. Thus, any minor changes to water circulation or bathymetry would not result in an adverse impact on EFH per the Magnuson-Stevens Act or per NEPA.

The deposition of dredged sediments for nearshore sand replenishment at SSTC would have minor, temporary effects due to altered bottom topography and turbidity, but no persistent effects on the fish community, and no adverse effect on EFH. No significant impacts are associated with sediment disposal.

As described above, implementation of Alternative 1 would result in adverse impacts to fish species and communities. However, due to the temporary and limited nature of the project activities within a limited geographic area, and since fish species would return to the project area following the completion of in-water activities, implementation of Alternative 1 would not result in significant impacts to fish communities. Impacts to EFH under the Magnuson-Stevens Act are discussed in detail in Appendix E.1 and are summarized in the EFH section below.

<u>Essential Fish Habitat</u>

The Navy consults with NMFS regarding actions, such as the proposed project, that have the potential to adversely affect EFH. Appendix E.1 contains the detailed EFH Assessment, which supported consultation. The Navy has addressed NMFS concerns regarding EFH, and NMFS and the Navy have agreed on conservation measures to be implemented. The Conservation

Recommendation forwarded in the NOAA Fisheries response to the Navy EFH Analysis (refer to Appendix A) will be integrated into the Proposed Action.

Of the approximately 90 species of fish previously identified in San Diego Bay, 9 are managed by the NMFS under two FMPs - the Coastal Pelagics and Pacific Groundfish Management Plans (PFMC 1998a, 1998b, 2011). Four are managed under the Coastal Pelagics FMP: northern anchovy, pacific sardine, pacific mackerel, and jack mackerel. Five species are covered under the Pacific Groundfish FMP and occur, although not in abundance, in San Diego Bay: California scorpionfish, grass rockfish, English sole, curlfin sole, and leopard shark (NAVFAC Southwest 2010, NAVFAC Southwest and Port of San Diego 2011).

Two species (northern anchovy and Pacific sardine) can be found throughout San Diego Bay. Jack mackerel were only found at the north bay survey area and Pacific mackerel were found at all but the southern survey station (Allen *et al.* 2002). All of these species are highly transient, are not tied to artificial substrates, and routinely experience turbid and noisy conditions due to natural processes and ship traffic within the bay.

Impacts from in-water project activities and the associated precautionary measures of either project alternative would be the same as described for other fish communities in the “Fisheries” section above. Namely, noise and turbidity associated with in-water construction and deconstruction activities would temporarily displace EFH species within a limited scope. Pier removal would reduce the algal and invertebrate production associated with encrusting communities on the pilings but would only impact eelgrass by increasing turbidity. When combined, these impacts would result in adverse effects per the Magnuson-Stevens Act but would not be considered significant under NEPA due to the temporary and limited nature of the impacts.

During development of the pier design, the pier alignment was positioned to minimize eelgrass disturbance and reduce the amount of eelgrass habitat shaded. However, not all eelgrass could be avoided. Approximately 0.05 ac of eelgrass surveyed in 2011, and an additional 0.05 ac of habitat that historically supported eelgrass, would be permanently shaded. Eelgrass and additional habitat that historically supported eelgrass that would be shaded represent a tiny fraction of that which is found within and adjacent to San Diego Bay (0.0027 percent and 0.0058 percent, respectively). Thus, there would be a minimal, adverse effect to EFH from pier construction under the Magnuson-Stevens Act, although this impact would be minimized by using the Navy’s established eelgrass mitigation bank. This impact would be further minimized by the increased abundance, diversity, and biomass found near the outer margins of pier structures compared to open water areas, as discussed in detail in Appendix E.1.

Approximately 0.67 ac of eelgrass in 2011, and an additional 0.32 ac of habitat that historically supported eelgrass, would be partially shaded by the proposed temporary relocation of the Navy marine mammal enclosures. Temporary impacts at NMAWC would be offset by the mitigation bank, but upon successful reestablishment of eelgrass within impacted areas at the NMAWC location, the bank would be credited for the reestablished acreage. As such, the temporary relocation of the Navy MMP and the marine mammal enclosures would have no adverse effect to EFH.

Both of the proposed bait barge temporary relocation sites are located over deep subtidal habitat and would not shade any eelgrass. Therefore, the temporary relocation of the bait barges would not result in any impacts to essential fish habitat.

Although there would be reduced artificial hard substrate, sunlight in the water column would be increased and the net effect of the reduced artificial substrate would be negligible. Over time, algae and invertebrates would be expected to colonize the new pier. To the extent that structural and/or shaded habitats would be preferred or avoided by certain species, utilization of the project sites by different fish species may shift slightly toward or away from the project site relative to the existing condition. Considering this, and the characteristics of the EFH species that may potentially occur in the project area and the habitat characteristics of the area itself, there would be no adverse effect to EFH from the small reduction of artificial hard substrate.

The use of dredged sediments for nearshore sand replenishment at SSTC would have minor, temporary effects on the substrate and water column, but no adverse effects on EFH (Appendix E.1).

3.2.3.4 Alternative 2 Delayed Dredging Alternative

Alternative 2 would have the same impacts and the same avoidance and minimization measures as Alternative 1, although the impacts associated with dredging would occur separately from those associated with the other project components since the dredging would only take place after the new fuel pier construction was completed. Therefore, there would be no significant effects on fisheries as a result of Alternative 2.

3.2.3.5 Mitigation Measures

Because potential impacts to fisheries would be localized, would cease upon completion of project activities, and would not be significant under either Alternative 1 or Alternative 2, no mitigation measures are proposed.

3.2.3.6 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, amendments to the existing navigation Security Zone, temporary relocation of the Everingham Bait Brothers Company bait barges, demolition and replacement of the existing fuel pier, and associated dredging of the turning basin would not occur. Existing conditions would remain unchanged. Therefore, implementation of the No-Action Alternative would not have a significant impact to fisheries.

3.3 BIRDS

3.3.1 Definition of Resource

This section describes birds within or adjacent to areas directly or indirectly affected by the proposed project. The Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703 *et seq.*) and the Migratory Bird Conservation Act (16 USC 715 *et seq.*) of 18 February 1929 (45 Stat. 1222) are the primary legislation in the United States established to conserve migratory birds. These statutes implement the United States' commitment to four bilateral treaties, or conventions, with Canada, Mexico, Russia, and Japan for the protection of a shared migratory bird resource. The MBTA prohibits the taking, killing, or possessing of migratory birds, or the parts, nests, or eggs of such birds, unless permitted by regulation. The species of birds protected by the MBTA are listed in Title 50, Section 10.13 (50 CFR 10.13) and represent almost all avian species found in North America. All of the species mentioned below are protected under the MBTA.

Migratory bird conservation relative to non-military readiness is addressed separately in a Memorandum of Understanding (MOU) developed in accordance with Executive Order (EO) 13186, signed 10 January 2001, "Responsibilities of Federal Agencies to Protect Migratory Birds." The MOU between the Department of Defense (DoD) and the USFWS was signed on 31 July 2006. DoD responsibilities discussed in the MOU include, but are not limited to:

1) Obtaining permits for import and export, banding, scientific collection, taxidermy, special purposes, falconry, raptor propagation, and depredation activities.
2) Encouraging incorporation of comprehensive migratory bird management objectives in the planning of DoD planning documents.
3) Incorporating conservation measures addressed in Regional or State Bird Conservation Plans in INRMPs.
4) Managing military lands and activities other than military readiness in a manner that supports migratory bird conservation.
5) Avoiding or minimizing impacts to migratory birds, including incidental take and the pollution or detrimental alteration of the environments used by migratory birds.
6) Developing, striving to implement, and periodically evaluating conservation measures for management actions to avoid or minimize incidental take of migratory birds, and if necessary, conferring with the service on revisions to these conservation measures.

Section 3.5, *Threatened and Endangered Species*, provides detailed information on the California least tern.

3.3.2 Affected Environment

The project area is located on the Point Loma side of northwestern San Diego Bay and includes man-made structures, nearshore habitat, and open water habitat. Bird abundance in shoreline areas ranges from 1-5 birds per hectare per month northeast of the fuel pier; 6-20 birds per hectare per month along the proposed Navy MMP temporary relocation site at NMAWC and to the north, south, and southeast of the fuel pier; and 101-292 birds per hectare per month near the bait barges. Bird richness ranges from 1-10 unique species east of the bait barges and southeast of the proposed Navy MMP temporary relocation site; and 11-25 unique species west of the bait barges, surrounding the fuel pier, and east of the proposed Navy MMP relocation site (NAVFAC Southwest and Port of San Diego 2011, TDI 2011). Bird abundance in open-water areas is throughout potentially affected portions of the northern bay, including the bait barge relocation sites, averaging 1-5 birds per hectare per month (TDI 2011).

San Diego Bay is part of a major bird migratory pathway, the Pacific Flyway, and supports large populations of over-wintering birds traveling between northern breeding grounds and southern wintering sites. More than 300 migratory and resident bird species have been documented to use San Diego Bay, including shore birds, gulls, marsh birds, and other waterfowl (NAVFAC Southwest and Port of San Diego 2011). Some of the most common waterfowl and seabird species in the bay include surf scoter (*Melanitta perspicillata*), eared grebe (*Podiceps nigricollis*), scaup species, bufflehead (*Bucephala albeola*), California brown pelican (*Pelecanus occidentalis californicus*), elegant tern (*Sterna elegans*), Heermann's gull (*Larus heermanni*), double-crested cormorant (*Phalacrocorax auritus*), Forster's tern (*Sterna forsteri*), California least tern (*Sternula antillarum browni*), mallard (*Anas platyrhynchos*), and great blue heron (*Ardea herodias*) (NAVFAC Southwest and Port of San Diego 2011, TDI 2011). Several species, as noted below, are considered sensitive by the USFWS or CDFW. See Section 3.5, *Threatened and Endangered Species*, for more detailed information on the California least tern.

Federal or state bird species of concern with the potential to occur in the project area include the double-crested cormorant, harlequin duck (*Histrionicus histrionicus*), California gull (*Larus californicus californicus*), common loon (*Gavia immer*), American merlin (*Falco columbiarus columbiarus*), osprey (*Pandion haliaetus carolinensis*), California brown pelican, black oystercatcher (*Haematopus bachmani*), elegant tern, great blue heron, black-crowned night heron (*Nycticorax nycticorax*), American peregrine falcon (*Falco peregrinus anatum*), and Forster's tern. Most of these species are considered sensitive only where breeding or nesting occurs, and there are no breeding seabirds in the project area. These birds use intertidal flats, shallow water habitat, or man-made structures for breeding or resting, similar to areas adjacent to the project area. However, the San Diego Bay National Wildlife Refuge, located at the southeast end of the bay, contains the greatest amount of intertidal mud flats and is well removed from the project area (NAVFAC Southwest and Port of San Diego 2011).

The bait barge relocation sites are in essentially the same habitat as the existing barges (deep subtidal), although farther from the mouth of the bay, and in similar proximity to the shoreline and areas of activity. The beach and nearshore waters at the SSTC reuse site are essentially identical to the nearby Imperial Beach site evaluated in the Draft EA in terms of use by shore- and waterbirds, respectively (NAVFAC Southwest 2011a, SANDAG and USACE 2011).

3.3.3 Environmental Consequences

3.3.3.1 Approach to Analysis

The analysis identifies the potential significance of impacts to birds based on: 1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; 2) the proportion of the resource that would be affected relative to its occurrence in the region; 3) the sensitivity of the resource to proposed activities; and 4) the duration and ecological ramifications of the impact. For example, an impact would be considered significant if it would permanently reduce the population size or distribution of a protected species.

3.3.3.2 Avoidance and Minimization Measures

Avoidance and minimization measures for birds would be the same as those for biological resource habitats and communities (Section 3.1.3.2). Avoidance and minimization measures to protect California least terns are provided in Section 3.5.3.2.

3.3.3.3 Alternative 1 Pier Replacement and Associated Dredging

Nearshore waters are the primary breeding habitat for many seabird species. Project activities would result in increases in noise and human activity, and decreases in water quality in the project area, during demolition, construction, and turning basin dredging. These activities may disturb migratory bird breeding and resting in the immediate vicinity while construction and/or demolition activity is occurring.

Responses to noise from pile driving would be limited to short-term behavioral or physiological responses (e.g., alert response, startle response, and temporary increase in heart rate). Noise from pile driving close to shore could have a short-term adverse impact on nesting and nearshore breeding species. However, human activity such as vessel or boat movement, and equipment setting and movement, could cause seabirds to flee the activity area before the onset of pile driving. If seabirds were in the activity area, they would likely flee the area prior to, or just after, the initial strike of the pile at the beginning of the ramp-up procedure. In-air pile driving noise is not likely to disrupt major behavior patterns, such as migrating, breeding, feeding, and sheltering, or to result in serious injury to any seabirds.

Information regarding the impacts from acoustic sources on seabirds and the ability for seabirds to hear underwater is virtually unknown. The exposure to underwater sounds by seabirds, other than pursuit diving species, is likely to be very limited due to spending a very short time under water (plunge-diving or surface-dipping) or breeding only at the water surface. Pursuit divers may remain under water for minutes, increasing the chance of underwater sound exposure. However, assuming that a seabird disturbed by an underwater sound would avoid the stressor by swimming to the surface, a physiological impact, such as hearing loss, would only occur if a seabird is close to an intense sound source. Furthermore, birds are generally less susceptible to both temporary and permanent threshold shift than mammals (Saunders and Dooling 1974), so an underwater sound exposure would have to be intense and of a sufficient duration to cause temporary or permanent threshold shift. Avoiding the sound by returning to the surface would further limit the potential for extended or multiple sound exposures underwater. Therefore, any impacts would be short-term, localized, and would not impact bird populations.

Both of the proposed bait barge temporary relocation sites are similar to the existing location in that they are located over deep subtidal habitat. The temporary relocation of the bait barges may result in localized changes in bird densities but would otherwise not result in any impacts to birds. Area birds normally resting on the bait barges are not expected to follow the barges to their new (temporary) location at Harbor Island East. The birds on the bait barges are predominantly cormorants, western gulls, herons, and pelicans. The cormorants and herons nest in the eucalyptus trees at NBPL near the existing bait barge location. Pelicans nest in offshore islands. All three of these species are tightly tied to their nesting sites and would likely remain at or near their nesting sites despite the relocation of their intermittent resting site on the bait barges. Since the primary activity for the birds at the bait barges is loafing and their primary breeding area is in the north bay and offshore, the birds are expected to stay in the north bay area and to find another intermittent resting location or locations. At NBPL, they may find such a resting location at Navy piers such as the Magnetic Silencing Pier or the beach area shoreward of that pier.

Dredging and in-water construction impacts would also alter fish behavior due to increased underwater noise levels (see Section 3.2, *Fisheries*), which may make fish more or less available as prey. However, impacts to marine birds are anticipated to be highly localized because marine birds are wide-ranging and have a large breeding habitat available in and around San Diego Bay relative to the breeding area that might be impacted by construction activities within the project area. Furthermore, these impacts would not be significant because of their limited duration and because birds on the water regularly experience the noise and disturbance of passing vessels, while the project area is routinely subject to the elevated noise and activity of workers and equipment associated with common industrial practices. Bird perches on the existing fuel pier would be lost. However, this is not expected to create a significant impact to migratory birds, as there are several other structures in San Diego Bay that could be used for this purpose and because migratory birds are expected to recolonize the new fuel pier once constructed. Additionally, no in-water demolition, construction, or dredging activities would occur during the least tern breeding season without the Navy first consulting with the USFWS.

Temporary relocation of the bait barges would have no impact on bird populations because other structures provide suitable perch sites throughout the northern bay, and the barges would remain in the same habitat.

Sediment deposition at the SSTC nearshore replenishment site would have minor, temporary, and hence non-significant effects on breeding and foraging conditions due the presence of the barge and turbidity.

In conclusion, implementation of Alternative 1 would not have a significant adverse effect under the MBTA and there would be no significant impacts on other non-migratory marine bird habitat or populations. Potential effects on California least tern are discussed in Section 3.5, *Threatened and Endangered Species*.

3.3.3.4 Alternative 2 Delayed Dredging Alternative

Alternative 2 would have the same impacts and the same avoidance and minimization measures as Alternative 1, although the impacts associated with dredging would occur separately from those associated with the other project components since the dredging would only take place after the new fuel pier construction was completed. Therefore, there would be no significant effects on birds as a result of Alternative 2.

3.3.3.5 Mitigation Measures

Because potential impacts to birds would be localized, would cease upon completion of project activities, and would not be significant under either Alternative 1 or Alternative 2, no mitigation measures are proposed.

3.3.3.6 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, amendments to the existing navigation Security Zone, temporary relocation of the Everingham Bait Brothers Company bait barges, demolition and replacement of the existing fuel pier, and associated dredging of the turning basin would not occur. Existing conditions would remain unchanged. Therefore, implementation of the No-Action Alternative would not have a significant impact to birds.

3.4 MARINE MAMMALS

3.4.1 Definition of Resource

This section describes marine mammals and the habitats in which they occur within areas directly or indirectly affected by the proposed project. Marine mammals are protected from "taking" under the Federal Marine Mammal Protection Act (MMPA) of 1972. Taking is defined as "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal." The term harassment is defined under the MMPA as any act of pursuit, torment, or annoyance that has the potential to do one or both of the following:

- Injure a marine mammal or marine mammal stock in the wild
- Disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering

As the project may result in non-injury takes of marine mammals under the MMPA, the Navy is consulting with NMFS on methods to minimize potential takes and has applied for and will obtain an Incidental Harassment Authorization (IHA) for anticipated takes before beginning underwater demolition and pile driving activities.

3.4.2 Affected Environment

Recognizing that the results from regional offshore surveys for marine mammals are not representative of northern San Diego Bay, the Navy has conducted marine mammal surveys in the project area beginning in 2007 and continuing through March 2012 (Merkel & Associates, Inc. 2008; U.S. Pacific Fleet 2009-2012; TDI 2012). Boat survey routes (Figure 3.4-1) established in 2007, which enable the detection of all marine mammals throughout the project area, have been resurveyed on 16 occasions, 12 of which were during the seasonal window for in-water construction (16 September – 31 March) and are hence applicable to the assessment of potential occurrence during pile driving activities. The Navy's IHA application and this analysis rely primarily on these surveys for the baseline on the species and numbers of marine mammals that occur in the activity area.

Figure 3.4-1
Navy Marine Mammal Survey Routes

Source: TDI 2012

Figure 3.4-2 shows the locations of all marine mammals documented in the Navy's surveys of the project area. Of the approximately 41 marine mammal species that occur in southern California waters (Carretta *et al.* 2012), only 3 year-round species and 1 migratory species are expected to occur in the general area of northern San Diego Bay and/or the immediate offshore waters. These include two pinnipeds - the U.S. stock of California sea lion (*Zalophus californianus*) and California stock of harbor seal (*Phoca vitulina richardii*); and two cetaceans – the California coastal stock of bottlenose dolphin (*Tursiops truncatus*) and the Eastern North Pacific stock of the gray whale (*Eschrichtius robustus*) (Navy 2010, NAVFAC Southwest and Port of San Diego 2011). Other species that occur in the Southern California Bight (SCB) may have the potential for isolated occurrence within San Diego Bay or just offshore (Navy 2010), but are very unlikely to occur in the affected Project Area, are expected to have zero density within potential acoustic zones of influence, and hence are not considered further. None of the four species that are likely to occur are listed under the Endangered Species Act (ESA), whereas all are protected under the MMPA. The relative abundance of these species in the project area is summarized in Table 3.4-1.

Table 3.4-1. Marine Mammals Occurring in the Vicinity of Naval Base Point Loma

Species	*Stock Abundance*[1]	*Relative Occurrence in North San Diego Bay*	*Season(s) of Occurrence*	*Abundance in the Project Area (density)*[2]
California sea lion *Zalophus californianus* U.S. Stock	296,750	Abundant	Year-round	Average 63.0 individuals in ZOI ($5.48/km^2$)
Harbor seal *Phoca vitulina* California stock	30,196 (CV= 0.157)	Uncommon, localized	Year-round	≤ 3 individuals in ZOI (≤ $0.26/km^2$)
Bottlenose dolphin *Tursiops truncatus* California coastal stock	323 (CV = 0.13)	Occasional	Year-round	Average 8.8 individuals in ZOI ($0.77/km^2$)
Gray whale *Eschrichtius robustus* Eastern North Pacific Stock	19,126 (CV = 0.071)	Rare visitor	Late winter	≤1 individual (≤ $0.09/km^2$)

Notes: CV= coefficient of variation; km^2 = square kilometers; ZOI = zone of influence.

Sources: [1]NMFS marine mammal stock assessment reports (Carretta *et al.* 2012, Allen and Angliss 2010). [2]Abundances from Navy Marine Mammal Surveys and monitoring (Merkel & Associates, Inc. 2008; U.S. Pacific Fleet 2009-2012; TDI 2012; Jenkins 2012) sightings within the maximum ZOI for vibratory pile driving (11.49 km^2).

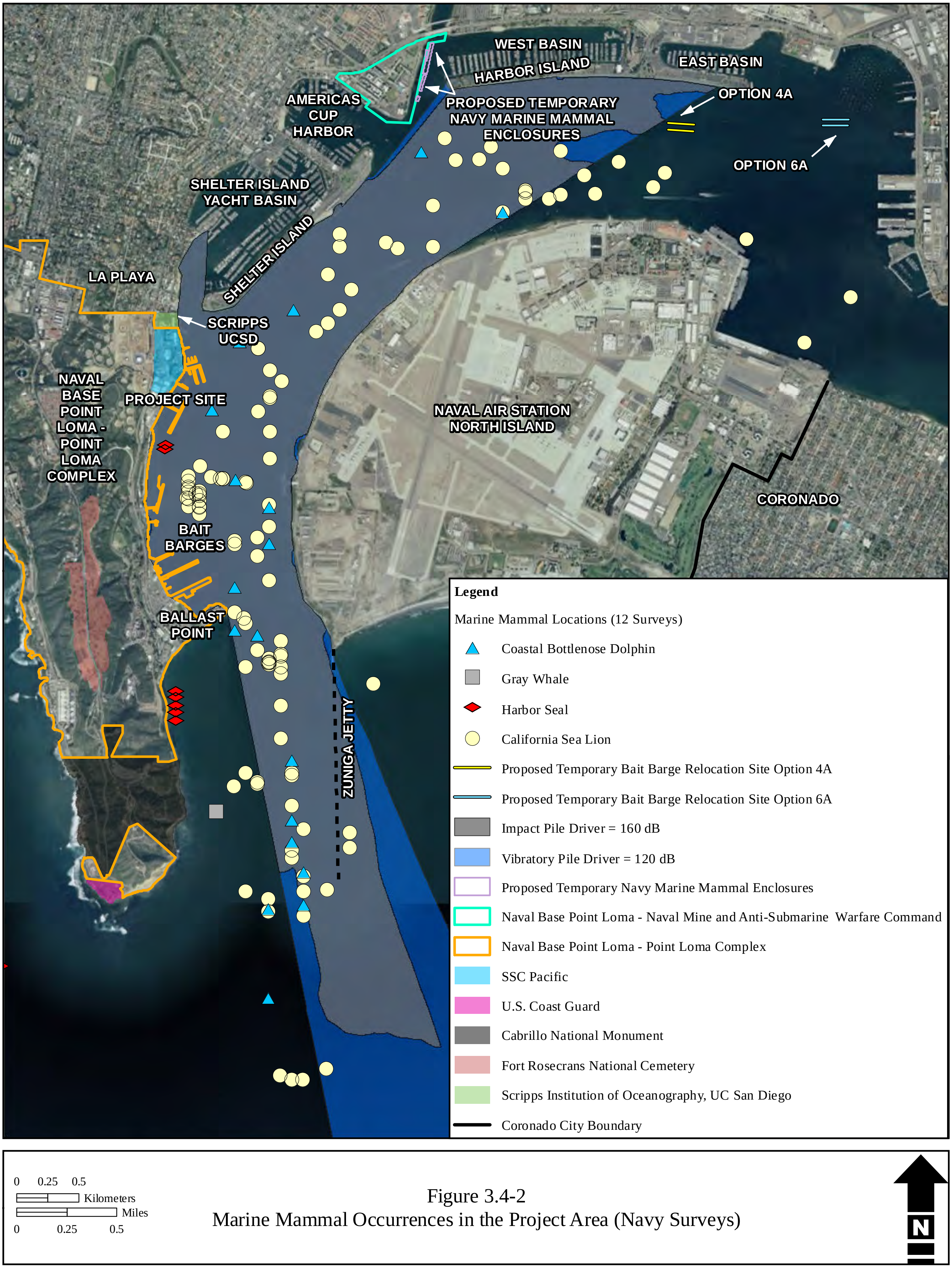


Figure 3.4-2
Marine Mammal Occurrences in the Project Area (Navy Surveys)

The U.S. stock of California sea lion and the California stock of harbor seal can be commonly found at haulout sites on the mainland and on navigation buoys, barges, and docks within California harbors. California sea lions and harbor seals do not typically haul out at the same location at the same time. Within and adjacent to San Diego Bay, California sea lions are the dominant and by far the most numerous pinniped observed, which may explain the absence of harbor seals from most of the area. California sea lions are especially abundant on the bait barges, which are relatively close to the fuel pier and are within the ZOI for potential harassment.

In the Navy's surveys, harbor seals have only been observed hauled out along the shore south of Ballast Point, outside of the ZOI for project pile driving activities, or elsewhere outside of the potential ZOI. However, harbor seals were observed in Navy monitoring of another project at Pier 122, roughly 250 m south of the fuel pier (Jenkins 2012; location shown on Figure 3.4-2). Therefore, harbor seals are considered potentially present and affected within the ZOI for harassment.

The Eastern North Pacific stock of gray whale occurs off southern California during their annual migration between summer feeding areas in the Bering and southern Chukchi seas and winter calving areas in Baja California and mainland Mexico. While gray whales may occasionally be found within a kilometer of shore during both their southward and northward migration periods, they are generally found farther offshore (Navy 2010). There has been only a single sighting of gray whales (one juvenile) during the Navy's surveys. Although this individual was outside of the ZOI for potential harassment by pile driving (TDI 2012; location shown on Figure 3.4-2), it likely crossed through the ZOI, and on rare occasions, individual gray whales have entered San Diego Bay and lingered for up to 2 weeks (NAVFAC Southwest and Port of San Diego 2011, Jenkins 2012). Therefore, the gray whale is considered potentially present and affected within ZOIs for behavioral harassment.

The California coastal stock of the bottlenose dolphin is a toothed whale (odontocete) that regularly inhabits the nearshore waters of southern California. This species regularly moves along the California coast and occasionally enters northern San Diego Bay. This particular stock has limited site fidelity and can be distributed anywhere between Monterey to northern Baja Mexico depending on localized prey abundance (Navy 2011). Bottlenose dolphins have been sighted with increasing regularity in San Diego Bay (TDI 2012, Jenkins 2012).

The species accounts that follow are drawn from the Navy's IHA Application, which provides additional detail.

3.4.2.1 California Sea Lion

<u>Status and Management</u>

The California sea lion is now considered to be a full species, separated from Galapagos sea lion (*Z. wollebaeki*) and the extinct Japanese sea lion (*Z. japonicus*) (Carretta *et al.* 2012). The breeding areas of the California sea lion are on the Channel Islands, western Baja California, and the Gulf of California. Mitochondrial DNA analysis of California sea lions has identified five genetically distinct geographic populations: (1) Pacific Temperate, (2) Pacific Subtropical, (3) Southern Gulf of California, (4) Central Gulf of California, and (5) Northern Gulf of California. The Pacific Temperate population makes up the U.S. stock and includes rookeries within U.S. waters and the Coronado Islands just south of the U.S.-Mexico border. The U.S. stock of California sea lion is not considered strategic or depleted.

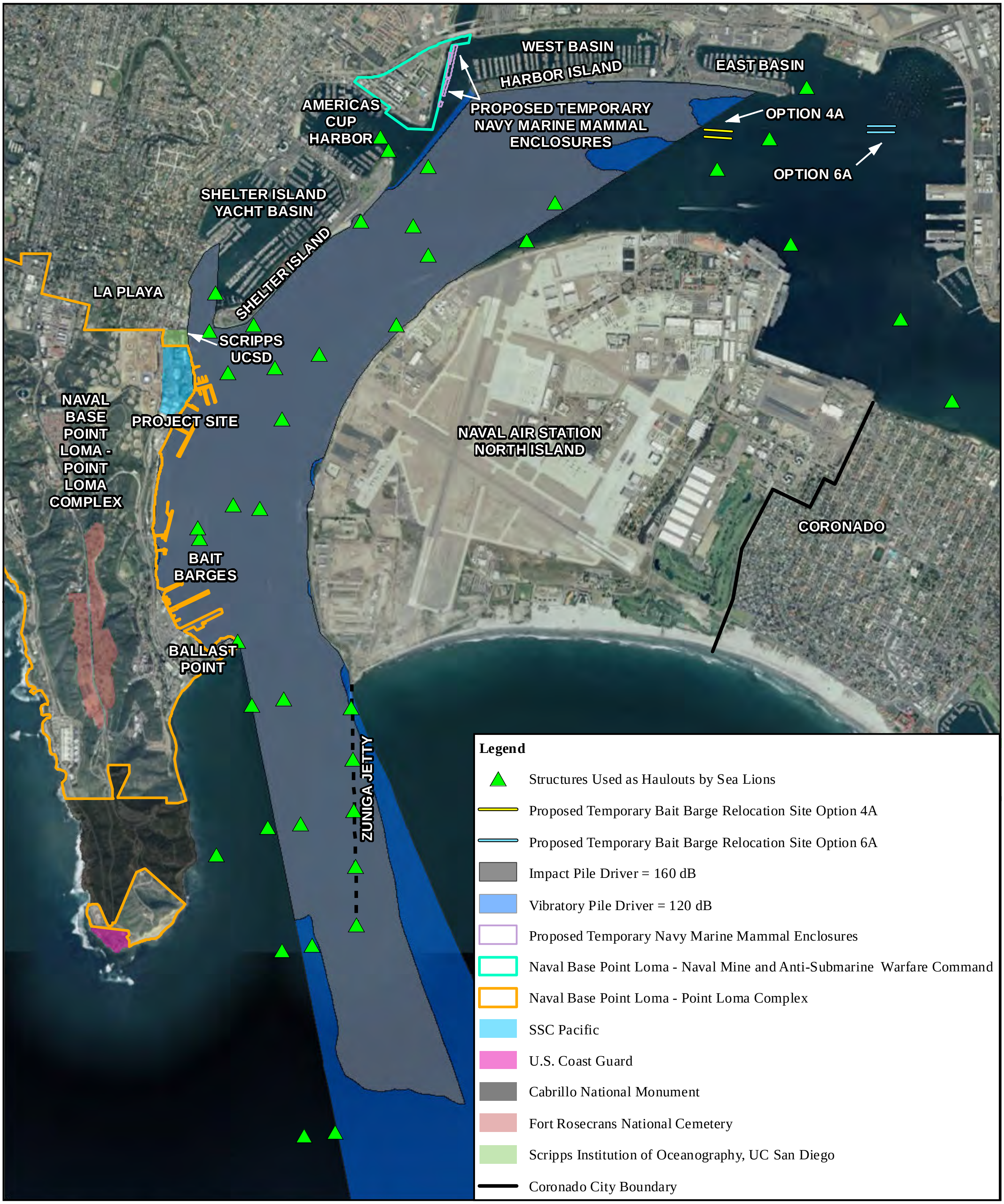
Distribution

More than 95 percent of the U.S. Stock breeds and gives birth to pups on San Miguel, San Nicolas, and Santa Barbara islands. Some movement has been documented between the U.S. Stock and Western Baja California, Mexico Stock, but rookeries in the United States are widely separated from the major rookeries of western Baja California. Smaller numbers of pups are born on San Clemente Island, the Farallon Islands, and Año Nuevo Island (Lowry *et al.* 1991). The California sea lion is by far the most commonly-sighted pinniped species at sea or on land in the vicinity of NBPL and northern San Diego Bay. In California waters, sea lions represented 97 percent (381 of 393) of identified pinniped sightings at sea during the 1998–1999 NMFS surveys (Carretta *et al.* 2000). They were sighted during all seasons and in all areas with survey coverage from nearshore to offshore areas (Carretta *et al.* 2000). Sea lions, while potentially present at-sea, are most commonly seen hauled-out on piers and buoys within and leading into San Diego Bay (Merkel & Associates, Inc. 2008). In a study of California sea lion reaction to human activity, Holcomb *et al.* (2009) showed that, in general, sea lions are rather resilient to human disturbance.

Population Abundance

The entire population cannot be counted because all age and sex classes are never ashore at the same time. In lieu of counting all sea lions, pups are counted when all are ashore, in July during the breeding season, and the number of births is estimated from pup counts (Carretta *et al.* 2012). The size of the population is then estimated from the number of births and the proportion of pups in the population. Based on these censuses, the U.S. stock has generally increased from the early 1900s, to a current estimate of 296,750, with a minimum estimate of 153,337 (Carretta *et al.* 2012). There are indications that the California sea lion may have reached or is approaching carrying capacity, although more data are needed to confirm that leveling in growth persists (Carretta *et al.* 2012).

San Diego Bay hosts a resident non-breeding population of California sea lions, numbers of which fluctuate as individuals move between the bay and rookeries on offshore islands. The Navy has conducted numerous marine mammal surveys overlapping the north San Diego Bay project area and the potential ZOI for impact and vibratory pile driving operations. California sea lions regularly occur on rocks, buoys and other structures, and especially on bait barges (Figure 3.4-3), although numbers vary greatly. Surveys were conducted along two survey routes through the northern part of the bay during 2007-2008 (Merkel & Associates, Inc. 2008). These transect surveys were recently repeated with minor modifications to thoroughly cover the northern part of the bay (U.S. Pacific Fleet 2009-2012, TDI 2012).



0 0.25 0.5 Kilometers
0 0.25 0.5 Miles

Figure 3.4-3
Structures Used as Haulouts by Sea Lions

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Based on the survey results, the average abundance of sea lions within the maximum project ZOI in northern San Diego Bay is 63.00 individuals, which translates to a site-specific density estimate of 5.48 individuals/km^2.

Behavior and Ecology

California sea lions are gregarious during the breeding season and social on land during other times. California sea lions' food consists of squid, octopus, and a variety of fishes. While no studies have occurred of their diet in the bay, studies of food sources have been done in other California coastal areas (Antonelis *et al.* 1990, Lowry *et al.* 1990, Melin *et al.* 1993, Hanni and Long 1995, Henry *et al.* 1995). Fish species found in the bay that sea lions most likely feed on include spiny dogfish, jack mackerel, Pacific herring, Pacific sardine, and northern anchovy. They also eat octopus and leopard shark (NAVFAC Southwest and Port of San Diego 2011).

California sea lions show a high tolerance for human activity (Holcomb *et al.* 2009), modify their breeding in response to spatial and temporal variations in the availability of different prey species (Lowry *et al.* 1991), and make opportunistic use of almost any available structures as haulouts (NAVFAC Southwest and Port of San Diego 2011).

Acoustics

On land, California sea lions make incessant, raucous barking sounds; these have most of their energy at less than 2 kHz (Schusterman *et al.* 1967). Males vary both the number and rhythm of their barks depending on the social context; the barks appear to control the movements and other behavior patterns of nearby conspecifics (Schusterman 1977). Females produce barks, squeals, belches, and growls in the frequency range of 0.25 to 5 kHz, while pups make bleating sounds at 0.25 to 6 kHz. California sea lions produce two types of underwater sounds: clicks (or short- duration sound pulses) and barks (Schusterman *et al.* 1966, 1967; Schusterman and Baillet 1969), both of which have most of their energy below 4 kHz (Schusterman *et al.* 1967).

The range of maximal hearing sensitivity underwater is between 1 and 28 kHz (Schusterman *et al.* 1972). Functional underwater high frequency hearing limits are between 35 and 40 kHz, with peak sensitivities from 15 to 30 kHz (Schusterman *et al.* 1972). The California sea lion shows relatively poor hearing at frequencies below 1 kHz (Kastak and Schusterman 1998). Peak hearing sensitivities in air are shifted to lower frequencies; the effective upper hearing limit is approximately 36 kHz (Schusterman 1974). The best range of sound detection is from 2 to 16 kHz (Schusterman 1974). Kastak and Schusterman (2002) determined that hearing sensitivity generally worsens with depth—hearing thresholds were lower in shallow water, except at the highest frequency tested (35 kHz), where this trend was reversed. Octave band noise levels of 65 to 70 dB above the animal's threshold produced an average temporary threshold shift (TTS) of 4.9 dB in the California sea lion (Kastak *et al.* 1999). Center frequencies were 1 kHz for corresponding threshold testing at 1 kHz and 2 kHz for threshold testing at 2 kHz; the duration of exposure was 20 minutes.

3.4.2.2 Harbor Seal

Status and Management

Harbor seals, which are members of the family Phocidae ("true seals"), inhabit coastal and estuarine waters and shoreline areas from Baja California to western Alaska. For management purposes, differences in mean pupping date (i.e., birthing), movement patterns, pollutant loads and fishery interactions have led to the recognition of three separate harbor seal stocks along the west coast of the continental U.S. The three distinct stocks are: 1) inland waters of Washington State (including Hood Canal, Puget Sound, and the Strait of Juan de Fuca out to Cape Flattery), 2) outer coast of Oregon and Washington, and 3) California (Carretta *et al.* 2012). The California stock is the only stock that is expected to occur within the Project Area. The California Stock of harbor seal is not considered strategic or depleted under the MMPA.

Distribution

Harbor seals are considered abundant throughout most of their range from Baja California to the eastern Aleutian Islands. An unknown number of harbor seals also occur along the west coast of Baja California, at least as far south as Isla Asuncion, which is about 100 miles south of Punta Eugenia. Peak numbers of harbor seals haulout on land during late May to early June, which coincides with the peak of their molt. They favor sandy, cobble, and gravel beaches (Stewart and Yochem 1994), with multiple haulouts identified along the California mainland and Channel Islands (Carretta *et al.* 2012).

Population Abundance

Based on post-breeding counts of individuals at known haulouts, corrected for the proportion of the population that is out at sea, the population estimate for the California stock of harbor seal is 30,196 (coefficient of variation [CV] = 0.157). The minimum population size is estimated as 26,667, with numbers apparently stabilizing during the past decade (Carretta *et al.* 2012). Harbor seals are relatively uncommon within San Diego Bay. Sightings in the Navy transect surveys of northern San Diego Bay cited above were limited to individuals outside of the ZOI, on the south side of Ballast Point. Therefore, the use of transect data would result in a density estimate of zero, which is unrealistic given the known occurrence of harbor seals in the general vicinity and the likelihood that a small number of individuals could occur (TDI 2012; Jenkins 2012). The Navy Marine Species Density Database (Hanser *et al.* 2012) developed an estimate for all of the waters of the Southern California Range Complex during winter and spring of 0.0202/km^2. Recent observations suggest the occurrence of 3 individuals within the ZOI just south of the Fuel Pier for approximately 1 month during the early spring (Jenkins 2012). Rather than rely on regional density estimates, this EA conservatively assumes the presence of these individuals as recently observed within the ZOI, for up to 30 days during the period of in-water activities.

Behavior and Ecology

Harbor seals prefer sheltered coastal waters and feed on schooling benthic and epibenthic fish species in shallow water (Bonnell and Dailey 1993). While not studied in the bay, specific prey species have been studied in other California waters (Stewart and Yokem 1985, 1994; Oxman

1993; Henry *et al.* 1995). Of particular note to San Diego Bay are these potential prey species: specklefin midshipman, plainfin midshipman, jack mackerel, shiner surfperch, yellowfin goby, and English sole. Harbor seals also eat octopus, of which two species are found in the bay (NAVFAC Southwest and Port of San Diego 2011). Although their ecological niche in the bay has not been studied, this pinniped is not likely to play a significant role because of their low numbers (NAVFAC Southwest and Port of San Diego 2011). Harbor seals mate at sea and females give birth during the spring and summer, although the "pupping season" varies by latitude.

Acoustics

In air, harbor seal males produce a variety of low-frequency (<4 kHz) vocalizations, including snorts, grunts, and growls. Male harbor seals produce communication sounds in the frequency range of 100 to 1,000 Hz (Richardson *et al.* 1995). Pups make individually unique calls for mother recognition that contain multiple harmonics with main energy below 0.35 kHz (Bigg 1981, Thomson and Richardson 1995). Harbor seals hear nearly as well in air as underwater and had lower thresholds than California sea lions (Kastak and Schusterman 1998). Kastak and Schusterman (1998) reported airborne low frequency (100 Hz) sound detection thresholds at 65.4 dB re 20 μPa for harbor seals. In air, they hear frequencies from 0.25 kHz - 30 kHz and are most sensitive from 6 to 16 kHz (Richardson *et al.* 1995, Terhune and Turnbull 1995, Wolski *et al.* 2003).

Adult males also produce underwater sounds during the breeding season that typically range from 0.025 to 4 kHz (duration range: 0.1 s to multiple seconds; Hanggi and Schusterman 1994). Hanggi and Schusteman (1994) found that there is individual variation in the dominant frequency range of sounds between different males, and Van Parijs *et al.* (2003) reported oceanic, regional, population, and site-specific variation that could be vocal dialects. In water, they hear frequencies from 1 to 75 kHz (Southall *et al.* 2007) and can detect sound levels as weak as 60 to 85 dB re 1 μPa within that band. They are most sensitive at frequencies below 50 kHz; above 60 kHz, sensitivity rapidly decreases.

3.4.2.3 Gray Whale

Status and Management

The Eastern North Pacific stock of gray whale occurs off southern California during their annual migration between summer feeding areas in the Bering and southern Chukchi seas and winter calving areas in Baja California and mainland Mexico. The southward migration occurs during November-December, whereas the return northward migration occurs during February-May. In 1994, due to steady increases in population abundance, the Eastern North Pacific stock of gray whales was removed from listing under the ESA. This stock is not considered strategic or depleted under the MMPA.

Distribution

The Eastern North Pacific population is found from the upper Gulf of California (Tershy and Breese 1991), south to the tip of Baja California, and up the Pacific coast of North America to the Chukchi and Beaufort seas. There is a pronounced seasonal north-south migration. The eastern

North Pacific population summers in the shallow waters of the northern Bering Sea, the Chukchi Sea, and the western Beaufort Sea (Rice and Wolman 1971). The northern Gulf of Alaska (near Kodiak Island) is also considered a feeding area; some gray whales occur there year-round (Moore *et al.* 2007). Some individuals spend the summer feeding along the Pacific coast from southeastern Alaska to central California (Sumich 1984; Calambokidis *et al.* 1987, 2002). Photo-identification studies indicate that gray whales move widely along the Pacific coast and are often not sighted in the same area each year (Calambokidis *et al.* 2002). In October and November, the whales begin to migrate southeast through Unimak Pass and follow the shoreline south to breeding grounds on the west coast of Baja California and the southeastern Gulf of California (Braham 1984, Rugh 1984). The average gray whale migrates 4,050 to 5,000 nautical miles (7,500 to 10,000 km) at a rate of 80 nautical miles (147 km) per day (Rugh *et al.* 2001, Jones and Swartz 2002). Although some calves are born along the coast of California (Shelden *et al.* 2004), most are born in the shallow, protected waters on the Pacific coast of Baja California from Morro de Santo Domingo (28°N) south to Isla Creciente (24°N) (Urbán-Ramírez *et al.* 2003). The main calving sites are Laguna Guerrero Negro, Laguna Ojo de Liebre, Laguna San Ignacio, and Estero Soledad (Rice *et al.* 1981).

Peak abundance of gray whales off the coast of San Diego is January during the southward migration, and in March during the migration north; although females with calves, which depart Mexico later than males or females without calves, can be sighted from March through May or June (Leatherwood 1974, Poole 1984, Rugh *et al.* 2001, Stevick *et al.* 2002, Angliss and Outlaw 2008). Gray whales are infrequent migratory transients offshore of San Diego Bay only during cold-water months (Carretta *et al.* 2000). Migrating gray whales that might infrequently transit the nearshore waters would not be expected to forage, and would likely be present for minutes to less than 1 or 2 hours at typical travel speeds of 3 knots (approximately 3.5 miles per hour) (Perryman *et al.* 1999, Mate and Urbán-Ramirez 2003).

A mean group size of 2.9 gray whales was reported for both coastal (16 groups) and non-coastal (15 groups) areas around San Clemente Island. The largest group reported was nine animals. The largest group reported by U.S. Navy (in 1998) was 27 animals (Carretta *et al.* 2000). Gray whales are not expected in the project area except during the northward migration, when they are closest to the coast (Rice *et al.* 1981).

Population Abundance

The Eastern North Pacific stock has continued to increase at rate of approximately 2.5 to 3.3 percent per year on average, with the most recent estimate of abundance being 19,126 individuals (Allen and Angliss 2010). Gray whales can occur near the mouth of San Diego Bay, and occasionally enter the bay (NAVFAC Southwest and Port of San Diego 2011). However, their occurrence in San Diego Bay is sporadic and unpredictable. Estimates of regional cold season abundance and density in the offshore waters (Hanser *et al.* 2012) are not representative of the project area. Even though gray whale transitory occurrence near the mouth of San Diego Bay is infrequent, for the purposes of the Navy's IHA application prepared as part of the NEPA process for the proposed project, it is conservatively assumed that one individual would be present in the ZOI during up to 15 days of the northward migration.

Behavior and Ecology

Gray whales use their baleen to sift out crustaceans, molluscs, and other invertebrates that they suck from bottom sediments. Bay species of potential benefit to gray whales for food would include medium to large size bivalve molluscs and decapod crustaceans, depending on the spacing between the baleen elements. However, they are unlikely to be feeding in the bay.

Gray whales dive to 160 to 200 ft for 5 to 8 minutes when breeding. In the breeding lagoons, dives are usually less than 6 minutes (Jones and Swartz 2002), although dives as long as 26 minutes have been recorded (Harvey and Mate 1984). Gray whales may remain submerged near the surface for 7 to 10 minutes and travel 1600 ft or more before resurfacing to breathe when migrating. The maximum known dive depth is 560 ft (Jones and Swartz 2002). Migrating gray whales sometimes exhibit a unique snorkeling behavior—they surface cautiously, exposing only the area around the blow hole, exhale quietly without a visible blow, and sink silently beneath the surface (Jones and Swartz 2002). Mate and Urbán-Ramirez (2003) noted that 30 of 36 locations for a migratory gray whale with a satellite tag were in water <330 ft deep, with the deeper water locations all in the SCB within the Channel Islands. Whales in that study maintained consistent speed indicating directed movement. There has been only one study yielding a gray whale dive profile, and all information was collected from a single animal that was breeding off the west coast of Vancouver Island (Malcolm and Duffus 2000, Malcolm *et al.* 1996). They noted that the majority of time was spent near the surface on interventilation dives (<10 ft depth) and near the bottom (extremely nearshore in a protected bay with mean dive depth of 60 ft, range 46-72 ft depth). There was very little time spent in the water column between surface and bottom. Breeding depth on summer feeding grounds is between 160-200 ft (50-60 m) (Jones and Swartz 2002). Based on this very limited information, the following is a rough estimate of depth distribution for gray whales: 50 percent at <13 ft (surface and interventilation dives) and 50 at 13-59 ft. However, most gray whales would be expected at shallower depths during transit through southern California where breeding does not occur due to migration and limited suitable bottom prey habitat.

Acoustics

Au (2000) reviewed the characteristics of gray whale vocalizations. Gray whales produce broadband signals ranging from 100 Hz to 4 kHz (and up to 12 kHz) (Dahlheim *et al.* 1984, Jones and Swartz 2002). The most common sounds on the breeding and feeding grounds are knocks (Jones and Swartz 2002), which are broadband pulses from about 100 Hz to 2 kHz and most energy at 327 to 825 Hz. The source level for knocks is approximately 142 dB re 1μPa at 1 m (Cummings *et al.* 1968). During migration, individuals most often produce low-frequency moans (Crane and Lashkari 1996). The structure of the gray whale ear is evolved for low-frequency hearing (Ketten 1992). The ability of gray whales to hear frequencies below 2 kHz has been demonstrated in playback studies (Cummings and Thompson 1971, Dahlheim and Ljungblad 1990, Moore and Clark 2002). Gray whale responses to noise include changes in swimming speed and direction to move away from the sound source; abrupt behavioral changes from feeding to avoidance, with a resumption of feeding after exposure; changes in calling rates and call structure; and changes in surface behavior, usually from traveling to milling (e.g., Moore and Clark 2002). Gailey *et al.* (2007) reported no apparent behavioral disturbance for Western Pacific Gray whales in response to low-frequency seismic survey.

3.4.2.4 Coastal Bottlenose Dolphin

Status and Management

The California coastal stock of bottlenose dolphin is distinct from the offshore population and is resident in the immediate (within 1 km of shore) coastal waters, occurring primarily between Point Conception, California, and San Quintin, Mexico. The California Coastal Stock of bottlenose dolphin is not considered strategic or depleted under the MMPA.

Distribution

The bottlenose dolphin California Coastal stock occurs at least from Point Conception south into Mexican waters, at least as far south as San Quintin, Mexico. In southern California, animals are found within 500 m of the shoreline 99 percent of the time and within 250 m 90 percent of the time (Hanson and Defran 1993). Occasionally, during warm-water incursions such as during the 1982–1983 El Niño event, their range extends as far north as Monterey Bay (Wells *et al.* 1990). Bottlenose dolphins in the SCB – the coastal waters between Point Conception and just south of the Mexican border - appear to be highly mobile within a narrow coastal zone (Defran *et al.* 1999), and exhibit little seasonal site fidelity to the SCB region (Defran and Weller 1999) and along the California coast; over 80 percent of the dolphins identified in Santa Barbara, Monterey, and Ensenada have also been identified off San Diego (Navy 2010).

Population Abundance

Based on photographic mark-recapture surveys conducted along the San Diego coast in 2004 and 2005, population size for the California Coastal Stock is estimated to be 323 individuals, with a 95 percent confidence interval of 259-430 (Carretta *et al.* 2012). If the 35 percent of animals encountered that lack identifiable dorsal fin marks were included within this stock, the true population size would be closer to 450-500 animals (Carretta *et al.* 2012). In the aforementioned surveys of San Diego Bay, numbers of coastal bottlenose dolphins were highly variable (from 0 to 40), with an average of 8.8 individuals within the maximum project ZOI.

Behavior and Ecology

The coastal stock utilizes a limited number of fish prey species with up to 74 percent being various species of surfperch or croakers, a group of non-migratory year-round coastal inhabitants (Defran *et al.* 1999, Allen *et al.* 2006). For southern California, common croaker prey species include spotfin croaker, yellowfin croaker, and California corbina, while common surfperch species include barred surfperch and walleye surfperch (Allen *et al.* 2006). The corbina and barred surfperch are the most common surf zone fish where bottlenose dolphins have been observed breeding (Allen *et al.* 2006). Defran *et al.* (1999) postulated that the coastal stock of bottlenose dolphins showed significant movement within their home range (Central California to Mexico) in search of preferred but patchy concentrations of nearshore prey (i.e., croakers and surfperch). Bearzi *et al.* (2009), in an analysis of coastal bottlenose dolphins in the vicinity of Santa Monica, also concluded that low individual re-sighting rates indicates a large coastal bottlenose dolphin distribution influenced by prey distribution. After finding concentrations of prey, animals may then forage within a more limited spatial extent to take advantage of this local accumulation until such time that prey abundance is reduced; the dolphins then shift location once again to be over larger distances (Defran *et al.*1999, Bearzi *et al.* 2009). Specific prey items of bottlenose dolphins along the California coast were studied by Defran *et al.* (1986). San Diego Bay bottlenose dolphins forage on species such as jack mackerel, Cortez grunt, striped mullet, black croaker, white sea bass, white croaker, spotted croaker, yellowfin croaker, California corbina, queenfish, Pacific mackerel, Pacific bonito, and sierra (NAVFAC Southwest and Port of San Diego 2011).

Acoustics

Sounds emitted by bottlenose dolphins have been classified into two broad categories: pulsed sounds (including clicks and burst-pulses) and narrow-band continuous sounds (whistles), which usually are frequency modulated. Whistles range in frequency from 0.8 to 24 kHz but can also go much higher. Clicks and whistles have a dominant frequency range of 110 to 130 kHz and a source level of 218 to 228 dB re 1 µPa at 1 m (peak to peak levels; Au 1993) and 3.5 to 14.5 kHz with a source level of 125 to 173 dB re 1 µPa at 1 m, respectively (Ketten 1998). The bottlenose dolphin has a functional high-frequency hearing limit of 160 kHz (Au 1993) and can hear sounds at frequencies as low as 40 to 125 Hz (Turl 1993). Inner ear anatomy of this species has been described (Ketten 1992). Electrophysiological experiments suggest that the bottlenose dolphin brain has a dual analysis system: one specialized for ultrasonic clicks and the other for lower-frequency sounds, such as whistles (Ridgway 2000). The audiogram of the bottlenose dolphin shows that the lowest thresholds occurred near 50 kHz at a level around 45 dB re 1 µPa (Nachtigall *et al.* 2000; Finneran and Houser 2006, 2007). Below the maximum sensitivity, thresholds increased continuously up to a level of 137 dB re 1 µPa at 75 Hz. Above 50 kHz, thresholds increased slowly up to a level of 55 dB re 1 µPa at 100 kHz, then increased rapidly above this to about 135 dB re 1 µPa at 150 kHz. Scientists have reported a range of best sensitivity between 25 and 70 kHz, with peaks in sensitivity occurring at 25 and 50 kHz at levels of 47 and 46 dB re 1 µPa (Nachtigall *et al.* 2000).

TTS in hearing have been experimentally induced and behavioral responses observed in captive bottlenose dolphins (Ridgway *et al.* 1997; Schlundt *et al.* 2000, 2006; Nachtigall *et al.* 2003; Finneran *et al.* 2003, 2005, 2007). Ridgway *et al.* (1997) observed changes in behavior at the following minimum levels for 1 second tones: 186 dB re 1 µPa at 3 kHz, 181 dB re 1 µPa at 20 kHz, and 178 dB re 1 µPa at 75 kHz. TTS levels were 194 to 201 dB re 1 µPa at 3 kHz, 193 to 196 dB re 1 µPa at 20 kHz, and 192 to 194 dB re 1 µPa at 75 kHz. Schlundt *et al.* (2000) exposed bottlenose dolphins to intense tones (0.4, 3, 10, 20, and 75 kHz); the animals demonstrated altered behavior at source levels of 178 to 193 dB re 1 µPa, with TTS after exposures between 192 and 201 dB re 1 µPa at 1 m (though one dolphin exhibited TTS after exposure at 182 dB re 1 µPa). Nachtigall *et al.* (2003) determined threshold for a 7.5 kHz pure tone stimulus. No shifts were observed at 165 or 171 dB re 1 µPa, but when the sound level reached 179 dB re 1 µPa, the animal showed the first sign of TTS. Recovery apparently occurred rapidly, with full recovery apparently within 45 minutes following sound exposure. TTS measured between 8 and 16 kHz (negligible or absent at higher frequencies) after 30 minutes of sound exposure (4 to 11 kHz) at 160 dB re 1 μPa (Nachtigall *et al.* 2004).

3.4.3 Environmental Consequences

3.4.3.1 Approach to Analysis

The analysis identifies the potential significance of impacts to marine mammals based on: 1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; 2) the proportion of the resource that would be affected relative to its occurrence in the region; 3) the sensitivity of the resource to proposed activities; and 4) the duration and ecological ramifications of the impact. An impact would be considered significant if it would permanently reduce the population (stock) size or distribution of a marine mammal.

Impacts to marine mammals associated with Alternative 1 or Alternative 2 would be primarily from increased underwater noise associated with demolition of the fuel pier, construction of the new fuel pier, and dredging of the turning basin. For pile driving and extraction associated with fuel pier construction, as well as pile driving at the proposed temporary Navy MMP relocation site, the Navy worked with researchers from the University of Washington to develop a rigorous model of underwater transmission loss, taking into account site-specific bathymetry and shoreline characteristics. The model's description, the duration of the activities upon which the model is based, and the model's results (predicted underwater sound contours) are summarized in Section 3.2.3.1. Additional details related to the underwater noise model's analysis are provided in Appendix E.4.

In addition to the underwater noise model, the predicted number of sea lions and bottlenose dolphins impacted, provided in Section 3.4.3.3, are also based on the spatial distribution of submergence both species, discussed below. The airborne sound propagation model and the take calculation are also discussed below.

<u>Fundamentals of Sound</u>

Sound is a physical phenomenon consisting of regular pressure oscillations that travel through a medium, such as air or water. Sound frequency is the rate of oscillation, measured in cycles per second or Hz. The amplitude (loudness) of a sound is its pressure, whereas its intensity is proportional to power and is pressure squared. The standard international unit of measurement for pressure is the Pascal, which is a force of 1 Newton exerted over an area of 1 square meter; sound pressures are measured in μPa.

Due to the wide range of pressure and intensity encountered during measurements of sound, a logarithmic scale is used, based on the dB, which, for sound intensity, is 10 times the $\log_{10}$ of the ratio of the measurement to reference value. For sound pressure level (SPL), the amplitude ratio in dB is 20 times the $\log_{10}$ ratio of measurement to reference. Hence, each increase of 20 dB in SPL reflects a 10-fold increase in signal amplitude (whether expressed in terms of pressure or particle motion). That is, 20 dB means 10 times the amplitude, 40 dB means 100 times the amplitude, 60 dB means 1,000 times the amplitude, and so on. Because the dB is a relative measure, any value expressed in dB is meaningless without an accompanying reference. In describing underwater sound pressure, the reference amplitude is usually 1 μPa, and is expressed as "dB re 1 µPa." For in-air sound pressure, the reference amplitude is usually 20 µPa and is expressed as "dB re 20 µPa."

The method commonly used to quantify airborne sounds consists of evaluating all frequencies of a sound according to a weighted filter that mimics human sensitivity to amplitude as a function of frequency. This is called A-weighting and the decibel level measured is called the A-weighted sound level (dBA). Methods of frequency weighting that reflect the hearing of marine mammals have been proposed (Southall *et al.* 2007, Finneran and Jenkins 2012) and are being used in new analyses of Navy testing and training effects, but have not been adopted for pile driving and other non-explosive impulsive sounds (Marine Species Modeling Team 2012). Therefore, underwater sound levels are not weighted and measure the entire frequency range of interest. In the case of marine construction work, the frequency range of interest is 10 Hz to 10 kHz.

Table 3.4-2 summarizes commonly used terms to describe underwater sounds. Two common descriptors are the instantaneous peak SPL and the root mean square (rms) SPL. The peak pressure is the instantaneous maximum or minimum overpressure observed during each pulse or sound event and is presented in dB re 1 µPa. The rms level is the square root of the mean of the squared pressure (= intensity) level as measured over a specified time period. All underwater sound levels throughout the remainder of this application are presented in dB re 1 µPa unless otherwise noted.

<u>Sound Exposure Criteria and Thresholds</u>

Under the MMPA, NMFS has defined levels of harassment for marine mammals. Level A harassment is defined as "Any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild." Level B harassment is defined as "Any act of pursuit, torment, or annoyance which has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including but not limited to migration, breathing, nursing, breeding, feeding or sheltering."

Since 1997, NMFS has used generic sound exposure thresholds to determine when an activity in the ocean that produces sound might result in impacts to a marine mammal such that a take by harassment might occur (NMFS 2005). Recent studies of pile driving used to construct offshore wind turbines have validated the distances over which underwater sound from pile driving may exceed NMFS thresholds (Bailey *et al.* 2010), as well as behavioral responses of harbor porpoises (*Phocoena phocoena*) to intense sound from pile driving (Brandt *et al.* 2011, Thompson *et al.* 2010). Current NMFS practice regarding exposure of marine mammals to high level sounds is that cetaceans and pinnipeds exposed to impulsive sounds of 180 and 190 dB rms or above, respectively, are considered to have been taken by Level A (injurious) harassment.

Level A harassment is assumed to result in a "stress response," which refers to an increase in energetic expenditure that results from exposure to the stressor and which is predominantly characterized by either the stimulation of the sympathetic nervous system or the hypothalamic-pituitary-adrenal axis (Reeder and Kramer 2005). The presence and magnitude of a stress response in an animal depends on the animal's life history stage, environmental conditions, reproductive state, and experience with the stressor (Navy 2010).

Table 3.4-2. Definitions of Acoustical Terms

Term	*Definition*
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for water is 1 microPascal (μPa) and for air is 20 μPa (approximate threshold of human audibility).
Sound Pressure Level, SPL	Sound pressure is the force per unit area, usually expressed in microPascals where 1 Pascal equals 1 Newton exerted over an area of 1 square meter. The SPL is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressure exerted by the sound to a reference sound pressure. SPL is the quantity that is directly measured by a sound level meter.
Frequency, Hz	Frequency is expressed in terms of oscillations, or cycles, per second. Cycles per second are commonly referred to as hertz (Hz). Typical human hearing ranges from 20 Hz to 20 kHz.
Peak Sound Pressure, dB re 1 μPa	Peak SPL is based on the largest absolute value of the instantaneous sound pressure over the frequency range from 20 Hz to 20 kHz. This pressure is expressed in this application as dB re 1 μPa.
Root-Mean-Square (rms), dB re 1μPa	The rms level is the square root of the mean of the squared pressure level(s) as measured over a specified time period. For pulses, the rms has been defined as the average of the squared pressures over the time that comprise that portion of waveform containing 90 percent of the sound energy for one impact pile driving impulse.
Sound Exposure Level (SEL), dB re 1 μPa2 sec	Sound exposure level is a measure of energy. Specifically, it is the dB level of the time integral of the squared-instantaneous sound pressure, normalized to a 1-sec period. It can be an extremely useful metric for assessing cumulative exposure because it enables sounds of differing duration, to be compared in terms of total energy.
Waveforms, μPa over time	A graphical plot illustrating the time history of positive and negative sound pressure of individual pile strikes shown as a plot of μPa over time (i.e., seconds).
Frequency Spectrum, dB over frequency range	The amplitude of sound at various frequencies, usually shown as a graphical plot of the mean square pressure per unit frequency ($\mu Pa^2/Hz$) over a frequency range (e.g., 10 Hz to 10 kHz in this application).
A-Weighting Sound Level, dBA	The SPL in decibels as measured on a sound level meter using the A- or C-weighting filter network. The A-weighting filter de-emphasizes the low and high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective human reactions to noise.
Ambient Noise Level	The background sound level, which is a composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.

Behavioral harassment (Level B) is considered to have occurred when marine mammals are exposed to sounds at or above 160 dB rms for impulse sounds (e.g., impact pile driving) and 120 dB rms for continuous noise (e.g., vibratory pile driving), but below injurious thresholds. Behavioral harassment may or may not result in a stress response. The criteria for vibratory pile driving would also be applicable to vibratory pile extraction or the use of a pneumatic chipper. The application of the 120 dB rms threshold can sometimes be problematic because this threshold level can be either at or below the ambient noise level of certain locations. As a result, these levels are considered precautionary (NMFS 2009; 74 CFR 41684). NMFS is developing new science-based thresholds to improve and replace the current generic exposure level thresholds, but the criteria have not been finalized (Southall *et al.* 2007). The current Level A (injury) and Level B (disturbance) thresholds are provided in Table 3.4-3.

Table 3.4-3. Injury and Disturbance Thresholds for Underwater and Airborne Sounds

Marine Mammals	*Airborne Marine Construction Criteria (Impact and Vibratory Pile Driving) (re 20 µPa)*	*Underwater Vibratory Pile Driving Criteria (e.g., non-pulsed/ continuous sounds)(re 1 µPa)*		*Underwater Impact Pile Driving Criteria (e.g., pulsed sounds) (re 1 µPa)*	
	Disturbance Guideline Threshold (Haulout)[1]	*Level A Injury Threshold*	*Level B Disturbance Threshold*	*Level A Injury Threshold*	*Level B Disturbance Threshold*
Cetaceans (whales, dolphins, porpoises)	N/A	180 dB rms	120 dB rms	180 dB rms	160 dB rms
Pinnipeds (seals, sea lions, walrus; except harbor seal)	100 dB rms (unweighted)	190 dB rms	120 dB rms	190 dB rms	160 dB rms
Harbor seal	90 dB rms (unweighted)	190 dB rms	120 dB rms	190 dB rms	160 dB rms

Notes: [1]Sound level at which pinniped haulout disturbance has been documented. Not an official threshold, but used as a guideline. N/A = not applicable.

Limitations of Existing Noise Criteria

To date, there is no research or data supporting a response by pinnipeds or odontocetes to continuous sounds from vibratory pile driving as low as the 120 dB threshold. The 120 dB rms threshold level for continuous noise originated from research conducted by Malme *et al.* (1984, 1986) for California gray whale response to continuous industrial sounds such as drilling operations. The 120 dB continuous sound threshold should not be confused with the 120 dB pulsed sound criterion established for migrating bowhead whales in the Arctic as a result of research in the Beaufort Sea (Richardson *et al.* 1995, Miller *et al.* 1999). Southall *et al.* (2007) reviewed studies conducted to document behavioral responses of harbor seals and northern elephant seals to continuous sounds under various conditions, and concluded that those limited studies suggest that exposures between 90 dB and 140 dB re 1 µPa rms generally do not appear to induce strong behavioral responses.

Ambient Noise

Ambient noise by definition is background noise and it has no single source or point. Ambient noise varies with location, season, time of day, and frequency. Ambient noise is continuous, but with much variability on time scales ranging from less than 1 second to 1 year (Richardson *et al.* 1995). Ambient underwater noise in San Diego Bay is highly variable over time, largely because of anthropogenic sources that include vessel engines and cranes, generators, and other types of mechanized equipment on piers and wharves or the adjacent shoreline (Urick 1983).

Underwater sound levels are comprised of multiple sources, including physical noise, biological noise, and anthropogenic noise. Physical noise includes waves at the surface, earthquakes, ice, and atmospheric noise. Biological noise includes sounds produced by marine mammals, fish, and invertebrates. Anthropogenic noise consists of vessels (small and large), dredging, aircraft overflights, and construction noise. Known noise levels and frequency ranges associated with anthropogenic sources similar to those that would be used for this project are summarized in Table 3.4-4. Details of each of the sources are described in the following text.

Table 3.4-4. Representative Noise Levels of Anthropogenic Sources

Noise Source	*Frequency Range (Hz)*[1]	*Underwater Noise Level (dB re 1 µPa)*	*Reference*
Small vessels	250 – 1,000	151 dB rms at 1 m	Richardson *et al.* 1995
Tug docking gravel barge	200 – 1,000	149 dB rms at 100 m	Blackwell and Greene 2002
Vibratory driving of 72-in Steel Pipe pile	10 – 1,500	180 dB rms at 10m	Caltrans 2007
Impact driving of 36-in Steel Pipe pile	10 – 1,500	195 dB rms at 10m	WSDOT 2007
Impact driving of 66-in Cast in Steel Shells (CISS) piles	100 – 1,500	195 dB rms at 10 m	Reviewed in Hastings and Popper 2005

Note: [1]These are the dominant frequency ranges but there is often considerable energy outside these ranges.

In-water construction activities associated with the Project would include impact pile driving and vibratory pile driving. The sounds produced by these activities fall into one of two sound types: pulsed and non-pulsed (defined below). Impact pile driving produces pulsed sounds, while vibratory pile driving produce non-pulsed (or continuous) sounds. The distinction between these two general sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (e.g., Ward 1997 as cited in Southall *et al.* 2007).

Pulsed sounds (e.g., explosions, gunshots, sonic booms, seismic airgun pulses, and impact pile driving) are brief, broadband, atonal transients (American National Standards Institute 1986, Harris 1998) and occur either as isolated events or repeated in some succession (Southall *et al.* 2007). Pulsed sounds are all characterized by a relatively rapid rise from ambient pressure to a maximal pressure value followed by a decay period that may include a period of diminishing, oscillating maximal and minimal pressures (Southall *et al.* 2007). Pulsed sounds generally have an increased capacity to induce physical injury as compared with sounds that lack these features (Southall *et al.* 2007).

Non-pulse (intermittent or continuous sounds) can be tonal, broadband, or both (Southall *et al.* 2007). Some of these non-pulse sounds can be transient signals of short duration but without the essential properties of pulses (e.g., rapid rise time) (Southall *et al.* 2007). Examples of non-pulse sounds include vessels, aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems (Southall *et al.* 2007). The duration of such sounds, as received at a distance, can be greatly extended in highly reverberant environments (Southall *et al.* 2007).

In the project area, extensive measurements were made of underwater noise levels during April-June of 2012 and (Figure 3.4-4 and Appendix E.5). Median values were predominantly in the range of 120-130 dB re 1µPa, with substantially higher maximum rms and peak SPL readings (in excess of 150 dB re 1µPa) due to passing ships. From Section 3.2.2.3, given there are about 225 commercial ship transits per day, most during daylight hours, plus an unknown but potentially equal number of recreational vessels moving in and out of San Diego Bay, underwater noise from passing ships is expected every few minutes in the North Bay. This pattern is expected to continue through the period of demolition and construction activities. The data indicate slightly ambient lower sound levels at the proposed bait barge relocation sites than at their existing location (refer to Appendix E.5).

The ambient sound data for the project area suggest that with increasing distance from the project site, particularly for vibratory pile driving, as received sound levels drop below approximately 140 dB re 1µPa rms, project sound would become undetectable with regard to potential monitoring and verification of sound levels, and that it would not be perceived by marine mammals as louder or significantly different than regularly occurring background noise due to vessels. As such, it would be unlikely to elicit biologically significant behavioral reactions.

Underwater Sound Propagation Formula

Pile driving and vibratory pile extraction would generate underwater noise that potentially could result in disturbance to marine mammals swimming by the Project Area. TL underwater is the decrease in sound intensity due to sound spreading and chemistry- and viscosity-based absorption as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for transmission loss is:

$$TL = B * \log_{10}(R) + C * R, \text{ where}$$

B = logarithmic (predominantly spreading) loss

C = linear (scattering and absorption) loss

R = ratio of receiver distance to source reference distance (usually 1m or 10m)

Figure 3.4-4
Ambient Underwater Sound Locations

The C term is strongly dependent on frequency, temperature, and depth, but is conservatively assumed to equal zero for pile driving. The B term has a value of 10 for cylindrical spreading and 20 for spherical spreading. A practical spreading value of 15 is often used in shallow water conditions where spreading may start out spherically but then end up cylindrically as the sound is constrained by the surface and the bottom. For this application, however, a site-specific model was developed for TL from pile driving at a central point at the project site (Appendix E.4). The model is based on historical temperature-salinity data and location-dependent bathymetry. The model's predictions result in a slightly lower average rate of TL than practical spreading, and hence are conservative. For pile driving at the Navy MMP relocation site (NMAWC), no site-specific modeling was conducted, and practical spreading loss is assumed.

Airborne Sound Propagation Formula

Pile driving can generate airborne noise that could potentially result in disturbance to marine mammals (pinnipeds hauled out or at the water surface. The Navy therefore analyzed the potential for pinnipeds hauled out or swimming at the surface near the project site to be exposed to airborne SPLs that could result in Level B behavioral harassment. The appropriate airborne noise thresholds for behavioral disturbance for all pinnipeds, except harbor seals is 100 dB re 20 µPa rms (unweighted) and for harbor seals is 90 dB re 20 µPa rms (unweighted) (see Table 3.4-3). A spherical spreading loss model, assuming average atmospheric conditions, was used to estimate the distance to the 100 dB and 90 dB re 20 µPa rms (unweighted) airborne thresholds. The formula for calculating spherical spreading loss is:

$$TL = 20\log r$$

where:

TL = Transmission loss

r = ratio of receiver distance to reference distance (equates to straight line distance from source when reference is at 1 m)

*Spherical spreading results in a 6 dB decrease in SPL per doubling of distance.

Basis for Estimating Take by Harassment

The U.S. Navy is seeking authorization for the potential taking of small numbers of California sea lions, harbor seals, gray whales, and coastal bottlenose dolphins in northern San Diego Bay as a result of pile removal and pile driving during demolition and construction activities associated with the Fuel Pier Replacement Project. The takes requested are expected to have no more than a minor effect on individual animals and no effect on the populations of these species. Any effects experienced by individual marine mammals are anticipated to be limited to short-term disturbance of normal behavior or temporary displacement of animals near source of the noise.

Spatial Distribution

Density assumes that marine mammals are uniformly distributed within a given area, although this is rarely the case. Marine mammals are usually clumped in areas of greater importance, for example, areas of high productivity, lower predation, safe calving, breeding, etc. The site-specific surveys of northern San Diego Bay provide high resolution of the distribution of marine mammals within the affected area. The distribution of sightings (see Figure 3.4-2) indicates that the assumption of uniform or random distribution throughout the affected area is reasonable, with two qualifiers: (1) sea lions are strongly concentrated on the bait barges; and (2) the area adjacent to and inshore of the fuel pier is not used to an appreciable extent.

Submergence

Cetaceans spend their entire lives in the water and spend most of their time (>90 percent for most species) entirely submerged below the surface. When at the surface, cetacean bodies are almost entirely below the water's surface, with only the blowhole exposed to allow breathing. This makes cetaceans difficult to locate visually and also exposes them to underwater noise, both natural and anthropogenic, essentially 100 percent of the time because their ears are nearly always below the water's surface.

Seals and sea lions (pinnipeds) spend significant amounts of time out of the water during breeding, molting, and "hauling out" (resting out of the water on land or structures) periods. Sea lions in San Diego Bay are most commonly observed out of water, especially on bait barges, navigation aids, and other structures. Within the bay, harbor seals would be most likely to occur in the water. When not actively diving, pinnipeds at the surface often orient their bodies vertically in the water column and often hold their heads above the water surface. Consequently, pinnipeds would not be exposed to underwater sounds to the same extent as cetaceans occurring in the same location, but would be subject to airborne noise to a greater degree.

For the purpose of assessing impacts from underwater sound at NBPL, the Navy assumed that that both cetaceans and pinnipeds that occur in the vicinity would be submerged and at the same water depth as the source, and would thereby experience the maximum received SPLs predicted to occur at a given distance from the acoustic source on the basis of acoustic modeling. However, pinnipeds are also conservatively assumed to be out of the water for sufficient periods to be exposed to whatever airborne noise is generated by construction activities as well.

California Sea Lion

California sea lions are present in northern San Diego Bay year-round and are by far the dominant marine mammal in the bay. The local population comprises adult females and sub-adult males and females, with adult males being uncommon (Merkel & Associates, Inc. 2008; Navy 2010; TDI 2012). The Navy conducted surveys by boat for marine mammals in northern San Diego Bay and adjacent waters on 16 separate occasions between 2007 and the end of March 2012. These surveys were conducted at slow speed (approximately 3-5 knots) along the same general routes (Figure 3.4-1) during calm weather and excellent viewing conditions. Observers were able to closely investigate and confirm sightings. Individuals that conducted the surveys (D. Lerma, C. Johnson, K. Merkel) are of the opinion that the detectability of animals within the study area at the time of the survey approached 100 percent. However, to account for the possibility that some parts of the study area may not have been covered due to access limitations, and to allow for variation in the accuracy of counts of large numbers of animals, a 95 percent detection rate is assumed.

During the surveys, the maximum number of sea lions observed within the study area, defined as the 120 dB ZOI for potential behavioral disturbance by vibratory pile driving, was 114, with an average abundance of 63.00 individuals per survey day; this translates to an average density of 5.48/km^2. Adjusting based on 95 percent detection results in an average abundance of 66.32, and density of 5.77/km^2. This estimate is remarkably close to that of the Navy Marine Species Density Database (NMSDD) (Hanser *et al.* 2012) for North and Central San Diego Bay, which is 5.75/km^2 for the summer and fall periods. Although the NMSDD estimate for winter and spring is lower (2.51/km^2), this difference appears largely due to the inclusion of more recent (2012) surveys in the Navy's IHA (Navy's IHA application) submitted to NMFS as part of the NEPA process for the proposed project (U.S. Pacific Fleet 2012, TDI 2012), which found higher numbers during winter and spring 2012 than were seen in previous surveys.

In the surveys analyzed for the Navy's IHA application, an average of 50.33 animals was observed on or swimming next to the bait barges. Assuming the same proportion of the population continues to spend most of their time at the bait barges when they are moved out of the ZOI, there would be an average of 12.67 individuals within the ZOI (1.11/km^2). Assuming 95 percent detection results in an estimated average abundance of 13.36 and density of 1.16/km^2 in the ZOI without the bait barges' influence.

Potential takes would likely involve sea lions that are loafing on or in the vicinity of structures or moving through the area en route to breeding areas or structures where they haul out. California sea lions that are taken could exhibit behavioral changes such as increased swimming speeds, increased surfacing time, or decreased breeding. Most likely, California sea lions may move away from the sound source and be temporarily displaced from the areas of pile driving. With the absence of any major rookeries and only a few isolated haulout areas near or adjacent to the project site, potential takes by disturbance will have a negligible short-term effect on individual California sea lions and would not result in population-level impacts.

Harbor Seal

Harbor seal occurrence within potential ZOIs for project activities is expected to consist of up to three individuals for approximately 1 month in the vicinity of Pier 122, roughly 250 m south of the fuel pier. The take estimate for harbor seals is based on these individuals experiencing both airborne and underwater sound from the project when they are present.

Potential takes would likely involve harbor seals that are on the shoreline or structures at the identified location, or swimming in the vicinity. The most likely movements of harbor seals would be to and from breeding areas in the kelp beds south of Ballast Point. Harbor seals that are taken could exhibit behavioral changes such as entering the water in response to airborne noise, increased swimming speeds, increased surfacing time, or decreased breeding. Most likely, harbor seals may move away from the sound source and be temporarily displaced from the areas of pile driving. With the absence of any major rookeries and only a few isolated haulout areas near or adjacent to the project site, potential takes by disturbance will have a negligible short-term effect on individual harbor seals and would not result in population-level impacts.

Gray Whale

Gray whale occurrence within northern San Diego Bay is sporadic and would likely consist of one to a few individuals that venture close to, or enter the bay for a brief period, then continue northward. The take estimate for gray whales assumes the presence of one individual for 15 days near the mouth of the bay during the month of March. Note that this could represent the same individual for 15 days, 15 individuals that pass through the area, or intermediate numbers for varying periods.

Coastal Bottlenose Dolphin

Coastal bottlenose dolphins can occur at any time of year in northern San Diego Bay. Numbers sighted have been highly variable, ranging from zero (5 out of 12 surveys) to more than 30 individuals. The Navy has conducted surveys by boat for marine mammals in northern San Diego Bay and adjacent waters on 16 separate occasions between 2007 and the end of March 2012. These surveys were conducted at slow speed (approximately 3.5 knots) along the same general routes (Figure 3.4-1) during calm weather and excellent viewing conditions. Observers were able to closely investigate and confirm sightings. Individuals that conducted the surveys (D. Lerma, C. Johnson, K. Merkel) were of the opinion that the detectability of animals within the study area at the time of the survey approached 100 percent. However, to account for the possibility that some parts of the study area may not have been covered due to access limitations, and to allow for variation in the accuracy of counts of large numbers of animals, a 95 percent detection rate is assumed. Unidentified dolphins recorded in the surveys are assumed to have been coastal bottlenose dolphins, which is the only dolphin that regularly occurs in San Diego Bay and adjacent waters (Navy 2011, NAVFAC Southwest and Port of San Diego 2011).

During the surveys, the maximum number of bottlenose dolphins observed within the study area, defined as the 120 dB ZOI for potential behavioral disturbance by vibratory pile driving, was 40, with an average abundance of 8.83 individuals per survey day; this translates to an average density of 0.77/km^2. Adjusting based on 95 percent detection results in an average abundance of 9.29 and density of 0.81/km^2. This estimate is higher than that of the NMSDD, which is 0.36/km^2 (Hanser *et al.* 2012) estimate for all of California coastal waters south of San Francisco within 1 km of the coast. The higher density used in this application is consistent with the regular occurrence of bottlenose dolphins in all four surveys conducted in San Diego Bay during the month of March 2012.

Potential takes could occur if bottlenose dolphins move through the area on breeding trips when pile driving would occur. Bottlenose dolphins that are taken could exhibit behavioral changes such as increased swimming speeds, increased surfacing time, or decreased breeding. Most likely, bottlenose dolphins may move away from the sound source and be temporarily displaced from the areas of pile driving. With the absence of any regular occurrence adjacent to the project site, potential takes by disturbance will have a negligible short-term effect on individual bottlenose dolphins and would not result in population-level impacts.

3.4.3.2 Avoidance and Minimization Measures

The following avoidance and minimization measures are divided into four sections: (1) Avoidance and Minimization Measures for Pile Driving Activities; (2) Avoidance and Minimization Measure Effectiveness; (3) Monitoring Plan; and (4) Reporting.

Avoidance and Minimization Measures for Pile Driving Activities

Proposed Measures

The modeling results for ZOIs were used to develop avoidance and minimization measures for pile driving activities at NBPL. The ZOIs effectively represent the avoidance and minimization zone that would be established to prevent Level A harassment to marine mammals.

1. Shutdown and Buffer Zone During Pile Driving and Removal

    - During pile driving and removal, the shutdown zone shall include all areas where the underwater SPLs are anticipated to equal or exceed the Level A (injury) harassment criteria for marine mammals (180 dB rms isopleth for cetaceans; 190 dB rms isopleth for pinnipeds). During all pile driving and removal activities, regardless of predicted SPLs, a conservative 10 m (33 ft) shutdown zone shall be established and monitored to prevent injury to marine mammal species from their physical interaction with construction equipment during in-water activities.

    - During pile driving and removal, the buffer zone shall include areas where the underwater and airborne SPLs are anticipated to equal or exceed the Level B (disturbance) harassment criteria for marine mammals (underwater: 160 dB rms isopleths for impact pile driving, 120 dB rms isopleth for vibratory pile driving; airborne: 90 dB rms isopleth for harbor seals, 100 dB isopleth for sea lions). The distance encompassing these zones will be adjusted to accommodate any difference between predicted and measured sound levels.

    - The shutdown and buffer zones will be monitored throughout the time required to drive or extract a pile. If a marine mammal is observed entering the buffer zone, an exposure would be recorded and behaviors documented. However, that pile segment would be completed without cessation, unless the animal approaches or enters the shutdown zone, at which point pile driving or extraction will be halted.

    - All buffer and shutdown zones will initially be based on the distances from the source that were predicted for each threshold level. However, in-situ acoustic monitoring will be utilized to determine the actual distances to these threshold zones, and the size of the shutdown and buffer zones will be adjusted accordingly (increased or decrease) based on received SPLs.

2. Shutdown Zone During Other In-water Construction or Demolition Activities
   - During all in-water construction or demolition activities having the potential to affect marine mammals, in order to prevent injury from physical interaction with construction equipment, a shutdown zone of 10 m (33 ft) will be monitored to ensure marine mammals are not present within this zone. These activities could include, but are not limited to: (1) the movement of a barge to the pile location, or (2) the removal of a pile from the water column/substrate via a crane (i.e., "dead pull").
3. Visual Monitoring
   a. Impact Installation: Monitoring will be conducted within the Level A harassment shutdown zone and Level B harassment buffer zone during impact pile driving before, during, and after pile driving activities. Monitoring will take place from 15 minutes prior to initiation through 15 minutes post-completion of pile driving activities.

   Vibratory Installation and Removal: Monitoring will be conducted for a 10 m (33 ft) shutdown zone. Given ambient underwater sound of approximately 124 dB re 1 μPa (rms), punctuated by louder sound from passing ships, as well as the difficulty of effectively monitoring the full extent of the predicted 120 dB re 1 μPa (rms) Level B behavioral disturbance ZOI for vibratory pile driving/extraction, the Navy intends initially to monitor a buffer zone equivalent to the full extent of the predicted Level B disturbance ZOI, but to adjust the extent of the monitored buffer zone based on acoustic monitoring (see below). The outer limits of the buffer zone would be defined by the point at which the measured SPL (maximum rms) produced by the equipment either declines to 120 dB re 1 μPa or falls below the median ambient SPL (rms) and hence becomes indistinguishable from background. Monitoring will take place from 15 minutes prior to initiation through 15 minutes post-completion of vibratory installation/removal activities.

   Other In-Water Activities: Monitoring will take place from 15 minutes prior to initiation until the action is complete.

   b. Monitoring will be conducted by qualified observers. All observers would be trained in marine mammal identification and behaviors, have experience conducting marine mammal monitoring or surveys, and would have no other construction-related tasks while monitoring. A trained observer will be placed from the best vantage point(s) practicable (e.g., from a small boat, the pile driving barge, on shore, or any other suitable location) to monitor for marine mammals and implement shut-down/delay procedures when applicable by calling for the shut-down to the hammer operator.

   c. Prior to the start of pile driving activity, the shutdown and safety zones will be monitored for 15 minutes to ensure that it is clear of marine mammals. Pile driving will only commence once observers have declared the shutdown zone clear of marine mammals; animals will be allowed to remain in the buffer zone and their behavior will be monitored and documented.

d. If a marine mammal approaches/enters the shutdown zone during the course of pile driving operations, pile driving will be halted and delayed until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone or 15 minutes have passed without re-detection of the animal.

e. In the unlikely event of conditions that prevent the visual detection of marine mammals, such as heavy fog, activities with the potential to result in Level A or Level B harassment will not be conducted.

4. Acoustic Measurements – Acoustic measurements will be used to empirically verify the proposed shutdown and buffer zones. For further detail regarding our acoustic monitoring plan, see the "Monitoring Plan" subsection below.

5. Timing Restrictions – The Navy has set timing restrictions to avoid noise and turbidity generating in-water construction and demolition activities in designated breeding habitat of the ESA-listed California least tern, from 1 April through 15 September. Underwater noise-generating activities would only occur from 16 September through 31 March.

6. Soft Start – The use of a soft-start procedure is believed to provide additional protection to marine mammals by providing a warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. The Indicator Pile Program will utilize soft-start techniques (ramp-up/dry fire) recommended by NMFS for impact and vibratory pile driving. These measures are as follows:

   "The soft-start requires contractors to initiate noise from vibratory hammers for 15 seconds at reduced energy followed by a 30-second waiting period. This procedure should be repeated two additional times. If an impact hammer is used, contractors are required to provide an initial set of three strikes from the impact hammer at 40 percent energy, followed by a 30-second waiting period, then two subsequent 3-strike sets."

   The 30-second waiting period is proposed based on the Navy's recent experience and consultation with NMFS on a similar project at Naval Base Kitsap at Bangor.

7. Daylight Construction – Pile driving will only be conducted during daylight hours.

Measures Considered but not Proposed

The use of bubble curtains to reduce underwater sound from impact pile driving was considered but is not proposed because strong tidal currents at the project site would disperse the bubbles and compromise the effectiveness of sound attenuation. Other considerations were that the potential for Level A exposures and the number and relative intensity of Level B exposures has already been reduced by (1) relocation of the bait barges; (2) primary reliance on vibratory installation of steel piles – in itself an accepted avoidance and minimization measure to reduce the intensity of underwater sound from pile driving (Caltrans 2009) - except for final testing of load bearing capacity and structural integrity as needed with an impact hammer; and (3) relatively small ZOIs associated with impact pile driving of concrete piles.

The use of a coffer dam surrounding each pile to absorb sound was also considered. The installation and take-down of the coffer dam around each pile would substantially increase the time required to drive each pile. With the construction schedule already maximizing the amount of work that can be done during daylight hours and outside of the least tern nesting season, this would translate into several additional years of construction. Reasons 1 through 3 above also indicated this measure would not be cost effective.

Silt curtains were considered but rejected as an avoidance and minimization measure for turbidity because (1) the sediments of the project site are sandy and will settle out rapidly when disturbed; (2) fines that do remain suspended would be rapidly dispersed by tidal currents; and (3) tidal currents would tend to collapse the silt curtains and make them ineffective.

Avoidance and Minimization Measure Effectiveness

It should be recognized that although marine mammals will be protected from Level A harassment by marine mammal observers (MMOs) monitoring the near-field injury zones, avoidance and minimization may not be 100 percent effective at all times in locating marine mammals in the buffer zone. The efficacy of visual detection depends on several factors including the observer's ability to detect the animal, the environmental conditions (visibility and sea state), and monitoring platforms.

All observers utilized for avoidance and minimization activities will be experienced biologists with training in marine mammal detection and behavior. Due to their specialized training, the Navy expects that visual avoidance and minimization measures will be highly effective. Trained observers have specific knowledge of marine mammal physiology, behavior, and life history that may improve their ability to detect individuals or help determine if observed animals are exhibiting behavioral reactions to construction activities.

Visual detection conditions in northern San Diego Bay are generally excellent. By its orientation, the bay is sheltered from large swells and infrequently experiences strong winds; winds are less than 17 knots 98 percent of the time between November and April (San Diego Bay Harbor Safety Committee 2009). Fog is anticipated on 10-20 percent of the days, typically in late night and early morning hours (San Diego Bay Harbor Safety Committee 2009) and could occasionally limit visibility for marine mammal monitoring. However, observers will be positioned in locations which provide the best vantage point(s) for monitoring, such as on nearby piers or on a small boat, and the shutdown and buffer zones cover relatively small and accessible areas of the bay. As such, proposed avoidance and minimization measures are likely to be very effective.

Monitoring Plan

The following monitoring measures would be implemented along with the avoidance and minimization measures for pile driving activities in order to reduce impacts to marine mammals to the lowest extent practicable. A marine mammal monitoring plan will be developed further and submitted to NMFS for approval prior to the start of construction. The monitoring plan includes the following components: acoustic measurements and visual observations.

The Navy intends to continue its marine mammal and acoustic surveys of the project area up until the in-water activities begin, at which time the monitoring described below would be implemented. The Navy would conduct post-project surveys as well on a quarterly basis to document any changes in the San Diego Bay populations of marine mammals.

Acoustic Measurements

The Navy will conduct acoustic monitoring for impact driving of steel piles in order to determine the actual distances to the 190 dB re 1µPa rms/180 dB re 1µPa rms and the 160 dB re 1µPa rms isopleths; for impact driving of other piles to determine the actual distance to the 160 dB re 1µPa rms isopleth; and for vibratory pile driving and extraction, including use of the pneumatic chipper, to determine the actual distance to either the 120 dB re 1µPa rms isopleth or the point at which the SPL (maximum rms) from the equipment diminishes to the median ambient SPL (rms) and hence becomes indistinguishable. The monitoring plan addresses both underwater and airborne sounds.

At a minimum, the methodology includes:

- Acoustic monitoring will be conducted for a minimum of five piles for each different type of pile and each different method of installation and removal.
- For underwater recordings, a stationary hydrophone system with the ability to measure SPLs will be placed in accordance with NMFS most recent guidance for the collection of source levels.
- For airborne recordings, reference recordings will be attempted at approximately 50 ft from the source via a stationary microphone. However, other distances may be utilized to obtain better data if the signal cannot be isolated clearly due to other sound sources (i.e., barges or generators).
- Hydrophones will be placed various distances and depths from piles using a static line or buoy. A weighted tape measure will be used to determine the depth of the water. The hydrophone will be attached to a nylon cord or steel chain if current is swift enough, to maintain a constant distance from the pile. The nylon cord or chain will be attached to a float or tied to a static line.
- Each hydrophone (underwater) and microphone (airborne) will be calibrated at the start of the action and will be checked at the beginning of each day of monitoring activity.
- For each monitored location, a two-hydrophone set-up will be used, with the first hydrophone at mid-depth and the second hydrophone at approximately 1 m from the bottom in order to evaluate site specific attenuation and propagation characteristics that may be present throughout the water column.
- In addition to determining the area encompassed by the 190, 180, 160, and 120 dB rms isopleths for marine mammals, hydrophones would also be placed at other distances as appropriate to accurately capture source levels and spreading loss.
- Ambient conditions, both airborne and underwater, would be measured at the project site in the absence of construction activities to determine background sound levels.

Ambient levels are intended to be recorded over the frequency range from 10 Hz to 20 kHz. Ambient conditions will be recorded for 1 minute every hour of the work day, for one week of each month of the period of the Navy's IHA.

- Sound levels associated with soft-start techniques will also be measured.
- Underwater SPLs would be continuously monitored during the entire duration of each pile being driven. Sound pressure levels will be monitored in real time. Sound levels will be measured in Pascals, which are easily converted to dB units.
- Airborne levels would be recorded as unweighted, as well as in dBA and the distance to marine mammal and/or avian thresholds (respectively) would be measured.
- Environmental data would be collected including, but not limited to, wind speed and direction; air temperature; humidity, surface water temperature; water depth; wave height; weather conditions and other factors that could contribute to influencing the airborne and underwater sound levels (e.g., aircraft, boats, etc.).
- The chief inspector would supply the acoustics specialist with the substrate composition, hammer model and size, hammer energy settings and any changes to those settings during the piles being monitored, depth of the pile being driven, and blows per foot for the piles monitored.
- For acoustically monitored piles, post-analysis of the sound level signals will include frequency spectra between 10 Hz and 20 kHz; determination of absolute peak overpressure and under pressure levels recorded for each pile; average, minimum, and maximum rms values; for each absolute peak pile strike, the rise time, average duration of each pile strike, number of strikes per pile, SEL of the absolute peak pile strike, mean SEL, and cumulative SEL (Accumulated SEL = single strike SEL + 10*log (# hammer strikes) and a frequency spectrum for up to eight successive strikes with similar sound levels.

Visual Marine Mammal Observations

The Navy will collect sighting data and behavioral responses to construction for marine mammal species observed in the region of activity during the period of construction. All observers will be trained in marine mammal identification and behaviors. NMFS requires that the observers have no other construction related tasks while conducting monitoring.

Methods of Monitoring

The Navy will monitor the shutdown zone and safety zone before, during, and after pile driving and removal. Based on NMFS requirements, the Marine Mammal Monitoring Plan would include the following procedures:

- MMOs would be located at the best vantage point(s) in order to properly see the entire shut down zone and safety zone. This may require the use of a small boat to monitor certain areas while also monitoring from one or more land based vantage points.
- During all observation periods, observers would use binoculars and the naked eye to search continuously for marine mammals.

- Monitoring distances will be measured with range finders.
- In-water activities would be curtailed under conditions of fog or poor visibility that would obscure the presence of a marine mammal within the shutdown zone.
- The shutdown and safety zones around the pile will be monitored for the presence of marine mammals before, during, and after any pile driving or removal activity.
- Pre-Activity Monitoring: The shutdown and buffer zones will be monitored for 15 minutes prior to in-water construction/demolition activities. If a marine mammal is present within the shutdown zone, the activity would be delayed until the animal(s) leave the shutdown zone. Activity would resume only after the MMO has determined, through sighting or by waiting approximately 15 minutes, that the animal(s) has moved outside the shutdown zone.
- During Activity Monitoring: The shutdown and buffer zones will also be monitored throughout the time required to drive and remove piles. If a marine mammal is observed entering the buffer zone, a "take" would be recorded and behaviors documented. However, that pile segment would be completed without cessation, unless the animal enters or approaches the shutdown zone, at which point all pile driving activities will be halted. Pile driving can only resume once the animal has left the shutdown zone of its own volition or has not been re-sighted for a period of 15 minutes.
- Post-Activity Monitoring: Monitoring of the shutdown and buffer zones would continue for 15 minutes following the completion of the activity.

Data Collection

NMFS requires that the MMOs use NMFS-approved sighting forms. NMFS requires that a minimum, the following information be collected on the sighting forms:

- Date and time that pile driving or removal begins or ends.
- Construction activities occurring during each observation period.
- Weather parameters identified in the acoustic monitoring (e.g., wind, humidity, temperature).
- Tide state and water currents.
- Visibility.
- Species, numbers, and if possible sex and age class of marine mammals.
- Marine mammal behavior patterns observed, including bearing and direction of travel, and if possible, the correlation to SPLs.
- Distance from pile driving activities to marine mammals and distance from the marine mammal to the observation point.
- Locations of all marine mammal observations.
- Other human activity in the area.

To the extent practicable, the Navy will record behavioral observations that may make it possible to determine if the same or different individuals are being "taken" as a result of project activities over the course of a day.

Reporting

A draft report would be submitted to NMFS within 45 days of the completion of acoustic measurements and marine mammal monitoring. The results would be summarized in graphical form and include summary statistics and time histories of sound values for each pile. A final report would be prepared and submitted to the NMFS within 30 days following receipt of comments on the draft report from the NMFS. At a minimum, the report shall include:

- General data:
  - Date and time of activities.
  - Water conditions (e.g., sea-state, tidal state).
  - Weather conditions (e.g., percent cover, visibility).
- Specific pile data for acoustically monitored piles:
  - Description of the activities being conducted.
    - Size and type of piles.
    - The machinery used for installation or removal.
  - The power settings of the machinery used for installation or removal
- Specific acoustic monitoring information:
  - A description of the monitoring equipment.
  - The distance between hydrophone(s) and pile.
  - The depth of the hydrophone(s).
  - The physical characteristics of the bottom substrate where the piles were driven or extracted (if possible).
  - Acoustic data (per the "Acoustic Measurements" subsection above) for each monitored pile and activity.
- Pre-activity observational survey-specific data:
  - Dates and time survey is initiated and terminated.
  - Description of any observable marine mammal behavior in the immediate area during monitoring.
  - If possible, the correlation to underwater sound levels occurring at the time of the observable behavior.
  - Actions performed to minimize impacts to marine mammals.
- During-activity observational survey-specific data:
  - Description of any observable marine mammal behavior within monitoring zones or in the immediate area surrounding monitoring zones.

  - If possible, the correlation to underwater or airborne sound levels occurring at the time of this observable behavior.
  - Actions performed to minimize impacts to marine mammals.
  - Times when pile extraction is stopped due to presence of marine mammals within the shutdown zones and time when pile driving resumes.
- Post-activity observational survey-specific data:
  - Results, which include the detections of marine mammals, species and numbers observed, sighting rates and distances, behavioral reactions within and outside of safety zones.
  - A refined take estimate based on the number of marine mammals observed during the course of construction.

3.4.3.3 Alternative 1 Pier Replacement and Associated Dredging

Potential Effects of Underwater Noise

The effects of pile driving on marine mammals are dependent on several factors, including the size, type, and depth of the animal; the depth, intensity, and duration of the pile driving sound; the depth of the water column; the substrate of the habitat; the standoff distance between the pile and the animal; and the sound propagation properties of the environment. Impacts to marine mammals from pile driving activities are expected to result primarily from acoustic pathways. As such, the degree of effect is intrinsically related to the received level and duration of the sound exposure, which are in turn influenced by the distance between the animal and the source. The further away from the source, the less intense the exposure should be. The substrate and depth of the habitat affect the sound propagation properties of the environment. Shallow environments are typically more structurally complex which leads to rapid sound attenuation. In addition, substrates which are soft (i.e., mud) will absorb or attenuate the sound more readily than hard substrates (rock) which may reflect the acoustic wave. Soft porous substrates would also likely require less time to drive the pile, and possibly less forceful equipment, which would ultimately decrease the intensity of the acoustic source.

Impacts to marine species are expected to be the result of physiological responses to both the type and strength of the acoustic signature (Viada *et al.* 2008). Behavioral impacts are also expected, though the type and severity of these effects are more difficult to define due to limited studies addressing the behavioral effects of impulsive sounds on marine mammals. Potential effects from impulsive sound sources can range from brief acoustic effects such as behavioral disturbance, tactile perception, physical discomfort, slight injury of the internal organs and the auditory system, to death of the animal (Yelverton *et al.* 1973, O'Keeffe and Young 1984, Navy 2001).

Physiological Responses

Direct tissue responses to impact/impulsive sound stimulation may range from mechanical vibration or compression with no resulting injury, to tissue trauma (injury). Because the ears are the most sensitive organ to pressure, they are the organs most sensitive to injury (Ketten

2000). Sound related trauma can be lethal or sub-lethal. Lethal impacts are those that result in immediate death or serious debilitation in or near an intense source (Ketten 1995). Sub-lethal impacts include hearing loss, which is caused by exposure to perceptible sounds. Severe damage, from a pressure wave, to the ear can include rupture of the tympanum, fracture of the ossicles, damage to the cochlea, hemorrhage, and cerebrospinal fluid leakage into the middle ear (NMFS 2008). Moderate injury implies partial hearing loss. Permanent hearing loss can occur when the hair cells are damaged by one very loud event, as well as prolonged exposure to noise. Instances of TTS and/or auditory fatigue are well documented in marine mammal literature as being one of the primary avenues of acoustic impact. Temporary loss of hearing sensitivity (TTS) has been documented in controlled settings using captive marine mammals exposed to strong SELs at various frequencies (Ridgway *et al.* 1997, Kastak *et al.* 1999, Finneran *et al.* 2005), but it has not been documented in wild marine mammals exposed to pile driving. While injuries to other sensitive organs are possible, they are less likely since pile driving impacts are almost entirely acoustically mediated, versus explosive sounds that also include a shock wave, which can result in damage.

No physiological responses are expected from pile driving operations occurring during the Fuel Pier Replacement Project for several reasons. Firstly, vibratory pile driving which is being utilized as the primary installation method, does not generate high enough peak SPLs that are commonly associated with physiological damage. Any use of impulsive pile driving will only occur from a short period of time (approximately 30 to 120 minutes per steel pile). Additionally, the avoidance and minimization measures that the Navy will be employing (see Section 3.4.3.2) will greatly reduce the chance that a marine mammal may be exposed to SPLs that could cause physical harm. The Navy will have trained biologists monitoring a shutdown zone equivalent to the Level A Harassment zone (inclusive of the 180 dB re 1 μPa (cetaceans) and 190 dB re 1 μPa (pinnipeds) isopleths to ensure no marine mammals are injured.

Behavioral Responses

Behavioral responses to sound are highly variable and context specific. For each potential behavioral change, the magnitude of the change ultimately determines the severity of the response. A number of factors may influence an animal's response to noise, including its previous experience, its auditory sensitivity, its biological and social status (including age and sex), and its behavioral state and activity at the time of exposure.

Habituation can occur when an animal's response to a stimulus wanes with repeated exposure, usually in the absence of unpleasant associated events (Wartzok *et al.* 2003). Animals are most likely to habituate to sounds that are predictable and unvarying. The opposite process is sensitization, when an unpleasant experience leads to subsequent responses, often in the form of avoidance, at a lower level of exposure. Behavioral state may affect the type of response as well. For example, animals that are resting may show greater behavioral change in response to disturbing noise levels than animals that are highly motivated to remain in an area for feeding (Richardson *et al.* 1995, National Research Council 2003, Wartzok *et al.* 2003).

Controlled experiments with captive marine mammals showed pronounced behavioral reactions, including avoidance of loud sound sources (Ridgway *et al.* 1997, Finneran *et al.* 2003).

Observed responses of wild marine mammals to loud pulsed sound sources (typically seismic guns or acoustic harassment devices, and also including pile driving) have been varied but often consist of avoidance behavior or other behavioral changes suggesting discomfort (Morton and Symonds 2002; Caltrans 2001, 2006; also see reviews in Gordon *et al.* 2004; Wartzok *et al.* 2003; and Nowacek *et al.* 2007). Responses to continuous noise, such as vibratory pile installation, have not been documented as well as responses to pulsed sounds.

With both types of pile driving, it is likely that the onset of pile driving could result in temporary, short term changes in the animal's typical behavior and/or avoidance of the affected area. A marine mammal may show signs that it is startled by the noise and/or may swim away from the sound source and avoid the area. Other potential behavioral changes could include increased swimming speed, increased surfacing time, and decreased breeding in the affected area. Pinnipeds may increase their haulout time, possibly to avoid in-water disturbance (Caltrans 2001, 2006). Since pile driving will likely only occur for a few hours a day, over a short period of time, it is unlikely to result in permanent displacement. Any potential impacts from pile driving activities could be experienced by individual marine mammals, but would not cause population level impacts, or affect the long-term fitness of the species.

Potential Effects of Airborne Noise

Marine mammals that occur in the project area could be exposed to airborne sounds associated with pile driving that have the potential to cause harassment, depending on their distance from pile driving activities. Airborne pile driving noise would have less impact on cetaceans than pinnipeds because noise from atmospheric sources does not transmit well underwater (Richardson *et al.* 1995); thus airborne noise would only be an issue for hauled-out pinnipeds in the Project Area. Most likely, airborne sound would cause behavioral responses similar to those discussed above in relation to underwater noise. For instance, anthropogenic sound could cause hauled out pinnipeds to exhibit changes in their normal behavior, such as reduction in vocalizations, or cause them to temporarily abandon their habitat and move further from the source. Studies by Blackwell *et al.* (2004) and Moulton *et al.* (2005) indicate a tolerance or lack of response to unweighted airborne sounds as high as 112 dB peak and 96 dB rms. Based on these observations marine mammals could exhibit temporary behavioral reactions to airborne noise, however, exposure is not likely to result in population level impacts.

Underwater Sound from Pile Driving and Extraction

The intensity of pile driving or sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity takes place. A large quantity of literature regarding SPLs recorded from pile driving projects is available for consideration. In order to determine reasonable SPLs and their associated effects on marine mammals that are likely to result from pile driving at NBPL, studies with similar properties to the proposed action were evaluated. Piles to be installed include 36- and 48-in steel pipes, 24- and 18-in concrete piles, and 16-in fiberglass-concrete piles. In addition, a vibratory pile driver could be used in the extraction of 16-in steel, 14- 16- and 24-in concrete, 13-in plastic, and 12-in timber piles.

Table 3.4-5 details representative pile driving activities that have occurred in recent years. Due to the similarity of these actions and the Navy's proposed action in terms of pile size and type, installation method, and water depth, as well as substrate and expected sound speed, they represent reasonable SPLs, which could be anticipated.

Table 3.4-5. Underwater Sound Pressure Levels from Similar *in-situ* Monitored Construction Activities

Project and Location	*Pile Size and Type*	*Installation Method*	*Water Depth*	*Measured Sound Pressure Levels*
Mukilteo Test Piles, WA[1]	36-in Steel Pipe	Impact	7.3 m (24 ft)	195 dB re 1 μPa (rms) at 10 m
Richmond-San Rafael Bridge, CA[2]	66-in CISS Pile	Impact	4.0 m (13.1 ft)	195 dB re 1 μPa (rms) at 10 m
Unknown Location, CA[2]	72-in Steel Pipe Pile	Vibratory	approximately 5 m (16.4 ft)	180 dB re 1 μPa (rms) at 10 m
San Francisco Bay, CA[2]	24-in Concrete	Impact	10-15 m (33-50 ft)	176 dB re 1 μPa (rms) at 10 m
San Francisco Bay, CA[2]	16-in Concrete	Impact	10 m (33 ft)	173 dB re 1 μPa (rms) at 10 m
Columbia River Crossing, WA[3]	24- and 48-in Steel Pipe Piles	Vibratory extraction	10 m (33 ft)	172 dB re 1 μPa (rms) at 10 m

Sources: [1]WSDOT 2007, [2]Caltrans 2009, [3]WSDOT 2012.

Underwater sound levels from pile driving for this project are assumed to be as follows:

- For 36- and 48-in steel pipes, 195 dB re 1 μPa (rms) at 10 m when driven by impact hammer, 180 dB re 1 μPa (rms) at 10 m when driven by vibratory hammer;
- For 24-in concrete piles driven by impact hammer, 176 dB re 1 μPa (rms) at 10 m; and
- For 16- and 18-in concrete piles driven by impact hammer, 173 dB re 1 μPa (rms) at 10 m.

As noted by NMFS (2010), there is a paucity of data on airborne and underwater noise levels associated with vibratory hammer extraction. However, it can reasonably be assumed that vibratory extraction emits SPLs that are no higher than SPLs caused by vibratory hammering of the same materials, and results in lower SPLs than caused by impact hammering comparable piles (NMFS 2010). The only available data regarding underwater sound from vibratory pile extraction are from the Columbia River Crossing Test Pile Project in Washington state (WSDOT 2012). In that project, underwater sound from vibratory extraction of several 24- and 48-in diameter steel pipes was found to range from 167 to 176 dB, averaging 172 dB re 1 μPa (rms) at 10 m. Because pile driving and extraction are less noisy for concrete than steel piles (Caltrans 2009), this is almost certainly greater than what would occur at the project site during removal of the existing pier structure, except possibly for the 16-in concrete-filled steel pipes. For vibratory extraction of concrete piles up to 24-in diameter, as well as the 12-in timber piles, a reduction of 10-20 dB from the sound produced by an impact driver can reasonably be assumed (Caltrans 2009). Accordingly, for the Navy's IHA application it is assumed that vibratory extraction of concrete, wood, or plastic piles would generate sound levels of up to 160 dB re 1 µPa (rms) at 10 m. This approach is consistent with NMFS' recent evaluation of a pier demolition project (NMFS 2010) and is likely to overestimate the potential for MMPA harassment during pier demolition.

There is scant information on underwater sound produced by pneumatic chippers or underwater cutting tools. The only data cited in recent IHA and Letter of Authorization applications (http://www.nmfs.noaa.gov/pr/permits/incidental.htm) were combined from a variety of diver tools, including jackhammers, drills, grinders, bolt guns, and hydraulic wrenches, showing peak source levels of up to 200 dB re 1µPa at 1 m and averaged levels of up to 161 dB re 1µPa at 1 m (Nedwell and Howell 2004). The averaged source levels would equate to approximately 141 dB re 1µPa at 10 m (assuming spherical spreading loss), but given the variability and uncertain applicability of these measurements to the proposed NBPL fuel pier replacement project, it is conservatively assumed that the pneumatic chipper could have up to the same sound source levels as vibratory extraction, i.e. 160 dB re 1µPa at 10 m, which equates to approximately 180 dB re 1µPa at 1 m.

Table 3.4-6 provides the calculated areas of ZOIs associated with different types of pile driving and extraction. It should be noted that the ZOIs for level A harassment would be closely monitored and subject to shutdowns if a marine mammal approaches the area. These calculations are based on the site-specific modeling of transmission loss at the project site, and practical spreading loss at the MMP relocation site. Predicted sound "contours" emanating from different sources are shown in Figures 3.2-1 through 3.2-7. The figures reflect the conventional assumption that the natural or man-made shoreline acts as a barrier to underwater sound. Although it is known that there can be leakage or diffraction around such barriers, the prediction of resulting sound levels remains in the research modeling world, and it is generally accepted practice to model underwater sound propagation from pile driving as continuing in a straight line past a shoreline projection such as Ballast Point (Dahl 2012). Although the influence of Zuniga Jetty was not modeled, it is reasonable to assume that project sound would not propagate east of the jetty (Dahl 2012). Hence the projection of sound through the mouth of the bay into the open ocean would be truncated along the jetty and narrower in reality than shown. The proposed bait barge relocation sites are outside of the predicted ZOIs associated with pile driving and extraction.

Table 3.4-6. Calculated Areas of ZOIs Corresponding to MMPA Thresholds

Description	*Figure*	*Source Level, dB @ 10m*	*Area of ZOI (km²)*				
			Pinniped Level A – 190 dB[1]	*Dolphin Level A – 180 dB[1]*	*Impact Level B – 160 dB[1]*	*Vibratory Level A – 180 dB[1,2]*	*Vibratory Level B – 120 dB[1]*
Impact driving steel piles	3.2-1	195	0.0034	0.1477	8.5069	N/A	N/A
Vibratory driving steel piles	3.2-2	180	N/A	N/A	N/A	0.0004	11.4895
Impact driving 24-in concrete piles	3.2-3	176	N/A	N/A	0.1914	N/A	N/A
Impact driving 16-in concrete-fiberglass piles	3.2-4	173	N/A	N/A	0.0834	N/A	N/A
Impact driving 18-in concrete piles	3.2-5	173	N/A	N/A	0.0620	N/A	N/A
Vibratory extraction – steel piles	3.2-6	172	N/A	N/A	N/A	0	11.4895
Vibratory extraction – non-steel piles[3]	3.2-7	160	N/A	N/A	N/A	0	11.4890

Notes: [1]All sound levels expressed in dB re 1 μPa rms; N/A = not applicable.
[2]The vibratory driving steel pile Level A ZOI for pinnipeds (190 dB) is less than 3 m from the source (<0.0001 km²).
[3]Including use of a pneumatic chipper.

Airborne Sound from Pile Driving

The intensity of pile driving sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity takes place. A large quantity of literature regarding SPLs recorded from pile driving projects is available for consideration. In order to determine reasonable airborne SPLs and their associated effects on marine mammals that are likely to result from pile driving at NBPL, studies with similar properties to the proposed action were evaluated. Studies that met the following parameters were considered: 1) Pile materials - steel pipe piles (36-48-in diameter); 2) Hammer machinery - vibratory and impact; and 3) Physical environment - shallow depth (<100 foot). Table 3.4-7 details representative pile driving activities that have occurred in recent years. Due to the similarity of these actions and the Navy's proposed action, they represent reasonable SPLs that could be anticipated.

Table 3.4-7. Airborne Sound Pressure Levels from Similar *in-situ* Monitored Construction Activities

Project and Location	*Pile Size and Type*	*Installation Method*	*Water Depth*	*Measured Sound Pressure Levels*
Northstar Island, AK[1]	42-in Steel Pipe Pile	Impact	approximately 12 m (40 ft)	97 dB re 20 µPa (rms) at 525 ft
Keystone Ferry Terminal, WA[2]	30-in Steel Pipe Pile	Vibratory	approximately 9 m (30 ft)	98 dB re 20 µPa (rms) at 36 ft

Sources: [1]Blackwell *et al.* 2004; [2]WSDOT 2010.

Based on in-situ recordings from similar construction activities, the maximum airborne noise levels that would result from impact and vibratory pile driving are estimated to be 97 dB re 20 µPa (rms) at 525 ft and 98 dB re 20 µPa (rms) at 36 ft, respectively (Blackwell *et al.* 2004, WSDOT 2010). The distances to the airborne thresholds were calculated with the airborne transmission loss formula presented in Section 3.4.3.1. All calculated distances to and the total area encompassed by the airborne marine mammal noise thresholds are provided in Tables 3.4-8 and 3.4-9, respectively.

Table 3.4-8. Calculated Distances to the Marine Mammal Noise Thresholds in Air from Pile Driving

Species	*Threshold*	*Airborne Behavioral Disturbance*	
		Distance to Threshold Impact Pile Driving	*Distance to Threshold Vibratory Pile Driving*
Pinnipeds (seals, sea lions, walrus, except harbor seal)	100 dB re 20 µPa rms (unweighted)	113 m (371 ft)	9 m (30 ft)
Harbor seal	90 dB re 20 µPa rms (unweighted)	358 m (1175 ft)	28 m (92 ft)

Table 3.4-9. Calculated Area Encompassed (Per Pile) by the Marine Mammal Noise Thresholds In-air from Pile Driving

Species	*Threshold*	*Airborne Behavioral Disturbance*	
		Area Encompassed by the Threshold for Impact Pile Driving	*Area Encompassed by the Threshold for Vibratory Pile Driving*
Pinnipeds (except harbor seal)	100 dB re 20 µPa rms (unweighted)	0.040 km^2	0.000 km^2
Harbor seal	90 dB re 20 µPa rms (unweighted)	0.403 km^2	0.002 km^2

The distance to the sea lion airborne threshold would be 113 m (371 ft) for impact pile driving, and 9 m (30 ft) for vibratory pile driving. The distance to the harbor seal airborne threshold would be 358 m (1,175 ft) for impact pile driving, and 28 m (92 ft) for vibratory pile driving. The nearest location for harbor seals is approximately 250 m away and hence would be subject to airborne behavioral disturbance. These distances are all less than the corresponding distances calculated for underwater sound thresholds. Other types of pile driving and extraction would generate far lower airborne sound pressures, with much smaller distances and areas of potential disturbance and for that reason are not considered further in this application.

Since protective measures are in place out to the distances calculated for the underwater Level A threshold for sea lions, the distances for the airborne thresholds will be covered fully by monitoring.

Auditory Masking

Natural and artificial sounds can disrupt behavior by masking, or interfering with a marine mammal's ability to hear other sounds. Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher levels. If the second sound is man-made and disrupts hearing-related behavior such as communications or echolocation (Wartzok *et al.* 2003), it could be considered harassment under the MMPA. Noise can only mask a signal if it is within a certain "critical band" around the signal's frequency and its energy level is similar or higher (Holt 2008). Noise within the critical band of a marine mammal signal will show increased interference with detection of the signal as the level of the noise increases (Wartzok *et al.* 2003). In delphinid subjects, for example, relevant signals needed to be 17 to 20 dB louder than masking noise at frequencies below 1 kHz in order to be detected and 40 dB greater at approximately 100 kHz (Richardson *et al.* 1995). It is important to distinguish TTS and permanent threshold shift, which persist after the sound exposure, from masking, which occurs during the sound exposure. Because masking (without a resulting in a threshold shift) is not associated with abnormal physiological function, it is not considered a physiological effect in the Navy's IHA application, but rather a potential behavioral effect.

The most intense underwater sounds in the proposed action are those produced by impact pile driving. Given that the energy distribution of pile driving covers a broad frequency spectrum, sound from these sources would likely be within the audible range of California sea lions, harbor seals, gray whales, and bottlenose dolphins. Impact pile driving activity is relatively short-term, with rapid pulses occurring for approximately 15 minutes per pile. Vibratory pile driving is also relatively short-term, with rapid oscillations occurring for approximately 1.5 hours per pile. It is possible that impact and vibratory pile driving resulting from this proposed action may mask some acoustic signals that are relevant to the daily behavior of marine mammal species, but the short-term duration and limited areas affected make it very unlikely that survival would be affected. Masking effects are, therefore, treated as negligible. Any masking event that could possibly rise to Level B harassment under the MMPA would occur concurrently within the zones of behavioral harassment already estimated for vibratory and impact pile driving, and which have already been taken into account in the exposure analysis.

Description of Take Calculation

The take calculations presented here rely on the best data currently available for marine mammal populations in San Diego Bay. The population data used for each species' take calculation is provided in Section 3.4.3.1. The formula was developed for calculating take due to pile driving and extraction as applicable and applied to the species-specific noise impact threshold. The formula is founded on the following assumptions:

- Each species' density is based on the average number seen (per day), adjusted upward assuming 95 percent detection, in Navy Marine Mammal surveys within the largest project ZOI - which is the 120 dB threshold for vibratory pile driving.
- ZOIs for underwater sound generating activities at the fuel pier location are based on sound emanating from a central point in the water column slightly offshore of the existing pier, at the source levels specified in Table 3.4-6, and rates of transmission loss derived from the site-specific model in Appendix E.4. Graphical representations of each ZOI were provided in Figures 3.2-1 through 3.2-7.
- Pile driving or vibratory extraction is conservatively estimated to occur on every day within the scheduled window for that component of project construction, as defined in Section 3.2.3.1.
- An individual can only be taken once due to underwater or airborne sound from pile driving, whether from impact or vibratory pile driving, or vibratory extraction, during each 24 hour period of that activity.
- Although sea lions and harbor seals in the project area spend a considerable amount of time above water, when they would not be subject to underwater sound, the conservative assumption is made that all sea lions within the ZOI are underwater during at least a portion of the noise generating activity, and hence exposed to sound at the predicted levels. However, all sea lions within each airborne sound ZOI are also assumed to be exposed to the airborne sound of each activity.

The calculation for marine mammal takes is estimated by:

Take estimate = (n *ZOI) * days of activity

where:

n = density estimate used for each species

ZOI[1] = noise threshold zone of influence (ZOI) impact area

n * ZOI produces an estimate of the abundance of animals that could be present in the area for exposure, this must be a whole number, therefore, this value was rounded (down if <0.5, up if >0.5).

[1] Zone of Influence (ZOI) is the area encompassed by all locations where the SPLs equal or exceed the threshold being evaluated.

The exposure assessment methodology is an estimate of the numbers of individuals exposed to the effects of pile driving and extraction activities exceeding NMFS established thresholds. Of significant note in these exposure estimates, additional mitigation methods (i.e., visual monitoring and the use of shutdown zones to ensure there are no Level A takes) were not quantified within the assessment and successful implementation of this mitigation is not reflected in exposure estimates. Results from acoustic impact exposure assessments should be regarded as conservative estimates that are strongly influenced by limited biological data. While the numbers generated from the pile driving exposure calculations provide conservative overestimates of marine mammal exposures for consultation with NMFS, the intermittent duration and limited geographic extent of in-water construction and demolition activities would further limit actual exposures and their potential biological effects.

California Sea Lion

As described in Section 3.4.3.1, the density of California sea lions observed within the maximum project area ZOI, subtracting out individuals that have been on or next to the bait barges, and which are assumed to move out of the ZOI with the bait barges when they are moved during the tern season, is 1.16/km^2. Table 3.4-10 provides the number of potential exposures constituting takes under the MMPA that would be caused by each project component during the first year of in-water activities.

Since steel pile installation involves a combination of vibratory and impact hammering, both are assumed to occur on the same day, and the number of animals taken is given by the maximum of either type of exposure. Given that the vibratory (120 dB) ZOI is larger, all animals considered behaviorally harassed by impact pile driving are also considered to be harassed by vibratory pile driving, whereas animals outside of the ZOI for impact hammering but within the ZOI for vibratory hammering would only be harassed by the latter. The total estimate for pile driving is thus 650 sea lion harassments by continuous sound from vibratory hammering, of which 500 would also constitute harassment by impulsive sound from impact hammering. This represents a daily take of 13 individuals, which may or may not be the same individuals from day to day. No harassments are anticipated from airborne sound of any type. Vibratory removal of concrete, plastic, and wood piles as part of demolition of the existing pier would result in 273 harassments, also representing a daily take of 13 individuals which may or may not be the same individuals from day to day (Table 3.4-10). To provide a more conservative estimate of total harassments, demolition use of vibratory extraction is assumed not to overlap the driving of steel piles for the new pier. Overall, a total of 923 California sea lion takes are predicted during the first 12-month period.

Table 3.4-10. Number of Potential Exposures Constituting Takes of California Sea Lions within Acoustic Threshold ZOIs During First 12-Month Period

Activity	*# Days*	*Underwater*				*Airborne*
		Impact Injury Threshold (190dB)	*Impact Disturbance Threshold (160dB)*	*Vibratory Injury Threshold (190 dB)*	*Vibratory Disturbance Threshold (120dB)*	*Impact and Vibratory Disturbance Threshold (100dB)**
Impact driving steel piles	50	0	500	N/A	N/A	0
Vibratory driving steel piles	50	N/A	N/A	0	650	0
Impact driving 24-in concrete piles	16	0	0	N/A	N/A	0
Vibratory removal non-steel piles	21	N/A	N/A	0	273	0

Note: *The airborne exposure calculations assumed that 100 percent of the in-water densities were available at the surface to be exposed to airborne sound.

Take estimates for the second and third years of in-water activities, based on the same assumptions and methods applied to planned activities are provided in Tables 3.4-11 and 3.4-12, respectively.

Table 3.4-11. Number of Potential Exposures Constituting Takes of California Sea Lions within Acoustic Threshold ZOIs During Second 12-Month Period

Activity	*# Days*	*Underwater*			*Airborne*
		Impact Injury Threshold (190dB)	*Impact Disturbance Threshold (160dB)*	*Vibratory Disturbance Threshold (120dB)*	*Impact and Vibratory Disturbance Threshold (100dB)**
Impact driving steel piles	102	0	1,020	N/A	0
Vibratory driving steel piles	102	N/A	N/A	1,326	0
Impact driving 24-in concrete piles	15	0	0	N/A	0

Note: *The airborne exposure calculations assumed that 100 percent of the in-water densities were available at the surface to be exposed to airborne sound.

Table 3.4-12. Number of Potential Exposures Constituting Takes of California Sea Lions within Acoustic Threshold ZOIs During Third 12-Month Period

Activity	*# Days*	*Underwater*			*Airborne*
		Impact Injury Threshold (190dB)	*Impact Disturbance Threshold (160dB)*	*Vibratory Disturbance Threshold (120dB)*	*Impact amd Vibratory Disturbance Threshold (100dB)**
Impact driving steel piles	12	0	120	N/A	0
Vibratory driving steel piles	12	N/A	N/A	156	0
Impact driving 24-in concrete piles	15	0	0	N/A	0
Impact driving 16-in fiberglass-concrete piles	12	0	0	N/A	0
Vibratory extraction non-steel piles	33	N/A	N/A	429	0
Vibratory extraction steel/concrete piles	6	0	0	78	0

Note: *The airborne exposure calculations assumed that 100 percent of the in-water densities were available at the surface to be exposed to airborne sound.

Harbor Seal

The take estimate for harbor seals is based on the presence of 3 animals during 30 days within both airborne and underwater ZOIs for Level B harassment by pile driving and extraction. Therefore, the worst-case total number of takes equals 90, the same 3 animals being taken repeatedly during the first year of in-water construction and demolition. During the second year, the 102 days of planned steel pile installation is assumed to overlap the period when harbor seals are present, again resulting in 3 individuals x 30 days of underwater and airborne noise exposure equals 90 takes. In the third year, the only potential harassments due to airborne noise would occur during 12 days of steel pile installation. Other activities causing harassment by underwater noise are assumed to occur on the remaining 18 days when harbor seals are present, resulting again in a total of 90 takes.

Gray Whale

The take estimate for gray whales is based on the presence of an individual animal during 15 days within the underwater ZOIs for pile driving and extraction near the mouth of the bay. Therefore, the worst-case take estimate for gray whales during each of the 3 years is 15, representing up to 15 different individuals taken.

Coastal Bottlenose Dolphin

As described in Section 3.4.3.1, the estimated density of coastal bottlenose dolphins observed within the maximum project area ZOI is 0.81/km2. Table 3.4-13 provides the number of potential exposures constituting takes under the MMPA that would be caused by each project component during the first year.

Table 3.4-13. Number of Potential Exposures Constituting Takes of Coastal Bottlenose Dolphins within Acoustic Threshold ZOIs During First 12-Month Period

Activity	*# Days*	*Impact Injury Threshold (180dB)*	*Impact Disturbance Threshold (160dB)*	*Vibratory Injury Threshold (180 dB)*	*Vibratory Disturbance Threshold (120dB)*
Impact driving steel piles	50	0	350	N/A	N/A
Vibratory driving steel piles	50	N/A	N/A	0	450
Impact driving 24-in concrete piles	16	0	0	N/A	N/A
Vibratory removal non-steel piles	21	N/A	N/A	0	189

Since steel pile installation involves a combination of vibratory and impact hammering, both are assumed to occur on the same day, and the number of animals taken is given by the maximum of either type of exposure. Given that the vibratory (120 dB) ZOI is larger, all animals considered behaviorally harassed by impact pile driving are also considered to be harassed by vibratory pile driving, whereas animals outside of the ZOI for impact hammering but within the ZOI for vibratory hammering would only be harassed by the latter. The total estimate for pile driving is thus 450 bottlenose dolphin harassments by continuous sound from vibratory hammering, of which 350 would also constitute harassment by impulsive sound from impact hammering. Vibratory removal of concrete, plastic, and wood piles as part of demolition of the existing pier would result in 189 harassments (Table 3.4-13). To provide a more conservative estimate of total harassments, demolition use of vibratory extraction is assumed not to overlap with the driving of steel piles for the new pier. Overall, a total of 639 coastal bottlenose dolphin takes are predicted during the first 12-month period. The total number of individuals taken is estimated as 9 per day, which may or may not be the same individuals on different days, during 71 days of vibratory/impact hammering and vibratory extraction.

Take estimates for the second and third years of in-water activities, based on the same assumptions and methods applied to planned activities, are provided in Tables 3.4-14 and 3.4-15, respectively.

Table 3.4-14. Number of Potential Exposures of Coastal Bottlenose Dolphins within Acoustic Threshold ZOIs During Second 12-Month Period

Activity	*# Days*	*Impact Injury Threshold (180dB)*	*Impact Disturbance Threshold (160dB)*	*Vibratory Disturbance Threshold (120dB)*
Impact driving steel piles	102	0	714	N/A
Vibratory driving steel piles	102	N/A	N/A	918
Impact driving 24-in concrete piles	15	0	0	N/A

Table 3.4-15. Number of Potential Exposures of Coastal Bottlenose Dolphins within Acoustic Threshold ZOIs During Third 12-Month Period

Activity	*# Days*	*Impact Injury Threshold (180dB)*	*Impact Disturbance Threshold (160dB)*	*Vibratory Disturbance Threshold (120dB)*
Impact driving steel piles	12	0	84	N/A
Vibratory driving steel piles	12	N/A	N/A	108
Impact driving 24-in concrete piles	15	0	0	N/A
Impact driving 16-in fiberglass-concrete piles	12	0	0	0
Vibratory extraction non-steel piles	33	N/A	N/A	297
Vibratory extraction steel/concrete piles	6	N/A	N/A	54

Summary

Based on the modeling results presented above, the total number of expected takes under MMPA is provided in Table 3.4-16. The Navy will submit sequential IHA applications for each year of in-water activities. All takes are anticipated to occur during fall through spring, 16 September through 31 March. All takes are anticipated to be Level B, disturbance. The totals for each species are as follows: California sea lions (2,405), harbor seals (270), gray whales (45), and coastal bottlenose dolphins (2,016).

Table 3.4-16. Summary of Potential Exposures Constituting Takes for All Species, All Years

Species	*Underwater*				*Airborne*	*Totals*
	Impact Injury Threshold (190 dB)	*Impact Injury Threshold (180 dB)*	*Both Impact Disturbance Threshold (160 dB) and Vibratory Disturbance Threshold (120 dB)*	*Vibratory Disturbance Threshold Only (120 dB)*	*Impact and Vibratory Disturbance Threshold (100 dB)**	
Year 1, 30 September 2013 through 29 September 2014						
California sea lion	0	N/A	500	423	0	923
Harbor seal	0	N/A	90	0	90	90*
Gray whale	0	0	15	0	N/A	15
Coastal bottlenose dolphin	0	0	350	289	N/A	639
Year 1 Total	**0**	**0**	**955**	**712**	**90**	**1,667***
Year 2, 30 September 2014 through 29 September 2015						
California sea lion	0	N/A	1,020	306	0	1,326
Harbor seal	0	N/A	90	0	90	90*
Gray whale	0	0	15	0	N/A	15
Coastal bottlenose dolphin	0	0	714	204	N/A	918
Year 2 Total	**0**	**0**	**1,839**	**510**	**90**	**2,349***
Year 3, 30 September 2015 through 29 September 2016						
California sea lion	0	N/A	120	543	0	663
Harbor seal	0	N/A	90	0	90	90*
Gray whale	0	0	15	0	N/A	15
Coastal bottlenose dolphin	0	0	84	375	N/A	459
Year 3 Total	**0**	**0**	**309**	**918**	**90**	**1,227***
Total, All Years						
California sea lion	0	N/A	1,640	765	0	2,405
Harbor seal	0	N/A	270	0	270	270*
Gray whale	0	0	45	0	N/A	45
Coastal bottlenose dolphin	0	0	1,148	868	N/A	2,016
Total All Years	**0**	**0**	**3,103**	**1,633**	**270**	**4,736***

Note: *In each year, the same three individual harbor seals would be subject to harassment by both underwater and airborne sound.

Conclusions Regarding Impacts to Species or Stocks

Individual marine mammals may be exposed to SPLs during pile driving and extraction operations at NBPL may result in Level B Behavioral harassment. Any marine mammals that are taken (harassed), may change their normal behavior patterns (i.e., swimming speed, breeding habits, etc.) or be temporarily displaced from the area of construction. Any takes would likely have only a minor effect on individuals and no effect on the population. The sound generated from vibratory pile driving is non-pulsed (e.g., continuous) which is not known to cause injury to marine mammals. Mitigation is likely to avoid most potential adverse underwater impacts to marine mammals from impact pile driving. Nevertheless, some level of impact is unavoidable. The expected level of unavoidable impact (defined as an acoustic or harassment "take") is described in sections above. This level of effect is not anticipated to have any detectable adverse impact on population recruitment, survival or recovery (i.e., no more than a negligible adverse effect).

Impacts to Marine Mammal Habitat

The proposed activities at NBPL will include the temporary relocation of bait barges used as haulouts by California sea lions, which is expected to result in a temporary redistribution of sea lions within northern San Diego Bay. The factors that currently attract sea lions to the barges are expected to operate equally in their new locations. There are no known breeding hotspots, or other ocean bottom structure of significant biological importance to marine mammals, that may be present in the marine waters in the vicinity of the Project Area. Therefore, the main impact issue associated with the proposed activity will be temporarily elevated noise levels and the associated direct effects on marine mammals, as discussed above. The most likely impact to marine mammal habitat occurs from pile driving effects on likely marine mammal prey (i.e., fish) nearby NBPL and minor impacts to the immediate substrate during installation and removal of piles.

Pile Driving Effects on Potential Prey (Fish)

Construction activities will produce both pulsed (i.e., impact pile driving) and continuous sounds (i.e., vibratory pile driving). Fish react to sounds that are especially strong and/or intermittent low-frequency sounds. Short duration, sharp sounds can cause overt or subtle changes in fish behavior and local distribution. Hastings and Popper (2005, Popper and Hastings 2009) identified several studies that suggest fish may relocate to avoid certain areas of noise energy. Additional studies have documented effects of pile driving (or other types of continuous sounds) on file, although several are based on studies in support of large, multiyear bridge construction projects (Scholik and Yan 2001, 2002; Govoni *et al.* 2003; Hawkins 2005; Hastings 1990, 2007; Popper *et al.* 2006; Popper and Hastings 2009). Sound pulses at received levels of 160 dB re 1 µPa may cause subtle changes in fish behavior. SPLs of 180 dB may cause noticeable changes in behavior (Chapman and Hawkins 1969, Pearson *et al.* 1992, Skalski *et al.* 1992). SPLs of sufficient strength have been known to cause injury to fish and fish mortality (Caltrans 2001, Longmuir and Lively 2001). The most likely impact to fish from pile driving activities at the Project Area would be temporary behavioral avoidance of the immediate area. The duration of fish avoidance of this area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution and behavior is anticipated. In general, impacts to marine mammal prey species are expected to be minor and temporary.

Pile Driving Effects on Potential Breeding Habitat

The area likely impacted by the Fuel Pier Replacement Project is relatively small compared to the available habitat in northern San Diego Bay. Given that the Navy's marine mammal surveys have documented no marine mammal occurrences in the immediate vicinity of the fuel pier (see Figure 3-2), the affected area is used little, if at all, as breeding habitat. As a result, the removal and replacement of pilings, substrate disturbance, and high levels of activity at the project site would be inconsequential in terms of effects on marine mammal breeding.

The duration of fish avoidance of this area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution and behavior is anticipated. Any behavioral avoidance by fish of the disturbed area would still leave significantly large areas of fish and marine mammal breeding habitat in northern San Diego Bay.

The project design has minimized effects on eelgrass beds and would mitigate any unavoidable losses by replacement. Hence the project would not negatively impact eelgrass beds and the important nursery and breeding habitat functions they provide for fish, which in turn serve as prey for marine mammals.

Summary of Impacts to Marine Mammal Habitat

Given the short daily duration of noise associated with individual pile driving\removal, seasonal limitations on the in-water activities that have the greatest potential to disturb marine mammals and their prey, and the relatively small areas being affected, pile driving and extraction activities associated with the proposed action are not likely to have a permanent, adverse effect on any EFH, or population of fish species. Therefore, pile driving\removal is not likely to have a permanent, adverse effect on marine mammal breeding habitat at the Project Area.

<u>Conclusion</u>

The Proposed Action would result in minor behavioral effects on individuals and localized, temporary effects on their habitat use but is not anticipated to have any detectable adverse impact on population recruitment, survival, or recovery (i.e., no more than a negligible adverse effect). NMFS accepted the Navy's IHA application and associated monitoring plan, and published the proposed rule to issue the IHA on 23 May 2013. Therefore, the implementation of Alternative 1 would not result in any significant impacts to marine mammals.

3.4.3.4 Alternative 2 Delayed Dredging Alternative

Alternative 2 would have the same impacts and the same avoidance and minimization measures as Alternative 1, although the impacts associated with dredging would occur separately from those associated with the other project components since the dredging would only take place after the new fuel pier construction was completed. Therefore, the implementation of Alternative 2 would not result in any significant impacts to marine mammals.

3.4.3.5 Mitigation Measures

Because potential impacts to marine mammals would be localized, would cease upon completion of project activities, and would not be significant under either Alternative 1 or Alternative 2, no mitigation measures are proposed.

3.4.3.6 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, amendments to the existing navigation Security Zone, temporary relocation of the Everingham Bait Brothers Company bait barges, demolition and replacement of the existing fuel pier, and associated dredging of the turning basin would not occur. Existing conditions would remain unchanged. Therefore, implementation of the No-Action Alternative would not have a significant impact to marine mammals.

3.5 THREATENED AND ENDANGERED SPECIES

3.5.1 Definition of Resource

This section describes species protected by the ESA that may occur within areas directly or indirectly affected by the proposed project.

3.5.2 Affected Environment

The three federally threatened or endangered species that occur or have the potential to occur in or adjacent to the proposed project area are provided in Table 3.5-1 and are discussed in detail below. Of these species, only the California least tern regularly occurs within the vicinity of the proposed project area. There is no designated critical habitat for these species in the proposed project area.

3.5.2.1 California Least Tern

The California least tern was listed as endangered in 1970; there is currently no designated critical habitat for this species (USFWS 2006). It is the smallest North American tern and is found along seacoasts, beaches, bays, estuaries, lagoons, lakes, and banks of rivers and lakes.

Least terns are inshore foragers and surface-feeding fish eaters who are opportunistic in their search for prey, eating fish that are small enough to catch including anchovies and smelt (NAVFAC Southwest and Port of San Diego 2011). Studies conflict as to whether piers, docks, sea walls, and other artificial structures along the shoreline may attract least terns; these structures typically act as artificial reefs for juvenile schooling fish, which terns feed upon, whereas human activity may be a deterrent (USACE 2009, NAVFAC Southwest and Port of San Diego 2011). Terns will also frequently forage in the open waters of the ocean and bays, and although eelgrass is an important habitat for several prey species, terns do not demonstrate any preference for feeding in eelgrass (NAVFAC Southwest and Port of San Diego 2011).

Table 3.5-1. Federally Threatened and Endangered Species Occurring or Having the Potential to Occur in the Vicinity of the Proposed Project Area

Species	*Status*	*Habitat*	*Occurrence*
California least tern (*Sterna antillarum browni*)	Endangered	Bays, estuaries, lagoons, shoreline, river mouths, sandy unvegetated strips. Spring-summer breeding resident.	Locally common spring-summer resident, feeding in bay and ocean waters. Nesting colonies outside of the project area around San Diego Bay. Breeding habitat is present within the San Diego Bay project area, off shore west of Naval Base San Diego (NBSD).
Green sea turtle (*Chelonia mydas*)	Endangered	Warm oceans, eelgrass beds. Non-breeding migrant.	Occurs in south bay, Coronado Bridge, South Bay Power Plant's warm water discharge channel. Feeds on marine algae and sea grasses, such as eelgrass. No breeding sites occur in San Diego Bay. Possible rare transient in the project area.
Western snowy plover (*Charadrius alexandrinus nivosus*)	Threatened	Intertidal mudflats, beaches, dunes, salt flats and dikes.	Local spring-summer breeding resident, migrant and wintering individuals at other times; inhabits sandy beaches. Breeding and wintering sites are known at SSTC, Naval Amphibious Base (NAB), and NAS North Island. Feeds on terrestrial and aquatic invertebrates such as amphipods, sand hoppers, and flies. Not known or likely in the San Diego Bay project area.

Note: Endangered = Listed as endangered under the federal ESA. Threatened = Listed as threatened under the federal ESA.

California least terns are residents in San Diego Bay from late spring to early fall, with the breeding season beginning 1 April and ending 15 September. In the spring of 2012, the first least tern nest was discovered on 28 April at Silver Strand Beach (Naval Base Coronado 2012). There are six recognized least tern nesting colonies in the bay, spanning from an area near the San Diego International Airport at the northern portion of the bay to the Sweetwater Marsh National Wildlife Refuge in the southern portion of the bay (Figure 3.5-1; NAVFAC Southwest 2004). Central portions of the bay house the largest nesting populations in the bay (NAVFAC Southwest 2004). The nesting population closest in proximity to the project area is located approximately 0.6 mi to the east of the proposed dredging area.

Five key breeding areas exist in the San Diego Bay region. Two are located outside of the Bay in the shallow ocean waters off of Coronado and Silver Strand Beach; a third is at the mouth of the bay; the fourth is inside the bay along the silver strand; and the fifth is in southern San Diego Bay, within the Sweetwater Marsh National Wildlife Refuge. The proposed project area is located almost entirely within the breeding area at the mouth of the bay (Figure 3.5-1).

California least terns nest in open expanses of sand or light-colored dirt on or near beaches and the shores of coastal bays. The nest is a small depression that may be natural, man-made, or excavated by the birds. One to four eggs are laid, although most nests have two or three. This species forages over shallow waters within 2 to 3 mi of the nest, feeding primarily on small fish, including silversides (*Atherinidae* spp.) and northern anchovy (Massey and Atwood 1985).

Figure 3.5-1
California Least Tern Nesting Sites and Foraging Areas Identified in the Tern MOU Within the Vicinity of the Proposed Project

Source: NAVFAC Southwest 2010a, 2010b

Least tern nesting populations for the bay have increased dramatically, from 187 in 1993 to 1,606 in 2006 (Navy 2006). In 2010, the estimated number of breeding pairs throughout San Diego Bay ranged from 1,418 to 1,478 (CDFW 2011). Tern populations have increased in the bay due to coordinated management strategies with the USFWS and the Navy on Navy lands. These strategies include predator management, tern monitoring, site preparation of tern nesting colonies, and biological information gathering (NAVFAC Southwest 2004).

The closest least tern nesting colonies to the project area are located at NAS North Island; specifically, the Runway 1-1 and the Ammo Dump alternative sites, all of which are on Navy land, approximately 2,800 ft (850 m) to the east of the proposed project area. All nesting sites at NAS North Island have close proximity to breeding areas. The only other nesting colony within the north bay is found at Lindberg Field. Other nesting colonies within central and south bay are found at North Delta Beach, South Delta Beach, NAB Ocean Beach, "D" Street, Chula Vista Wildlife Reserve, and South Bay Refuge (NAVFAC Southwest 2004). All of these nesting areas, with the exception of the airport location, have been used annually since 1994.

The Navy implements an extensive program of research, monitoring, protection, nest site enhancement, and avoidance measures to minimize the take of California least tern from Navy activities. An MOU between the USFWS Ecological Services and Refuges and NAVFAC Southwest and NRSW (USFWS and Navy 2004, NRSW 2008) summarizes efforts and commitments by the U.S. Navy and USFWS to California least tern conservation and enhancement in San Diego Bay. The MOU is included in this EA as Appendix E.2.

3.5.2.2 Green Sea Turtle

The green sea turtle is federally threatened throughout its eastern North-Pacific range. A small population primarily resides in southern San Diego Bay's warmer waters, which are heated by cooling water discharge from the South Bay Power Plant. It is also believed that other green sea turtles migrate from nesting sites in Mexico to San Diego Bay to forage on red algae, sea lettuce, and eelgrass. The number of turtles using the Bay varies but is estimated to range from 30 to 60 animals, increasing to nearly 100 during peak migratory time periods (NAVFAC Southwest and Port of San Diego 2011). As such, transient green sea turtles may occur in the proposed project area, although they have not been detected in the North Bay in recent years (Richter 2012).

3.5.2.3 Western Snowy Plover

The western snowy plover is a federally threatened bird species that nests in colonies on sandy beaches along the west coast of the United States and into southern Baja California. They occur on the beaches in the San Diego Bay area and on the salt work levees in the south Bay. The majority (78 percent) of the coastal breeding colonies in California occur on eight sites from San Francisco Bay to Oxnard and the Channel Islands (NAVFAC Southwest and Port of San Diego 2011). There were an estimated 248 snowy plovers in San Diego County in 2010 and 277 in 2011 during the breeding season (USFWS 2011). Of the 126 nests in the county in 2006, approximately 54 percent were at Camp Pendleton, 6 percent at Batiquitos lagoon, and 34 percent were in the San Diego Bay area at several sites (in decreasing order of importance—NAB Coronado [Ocean], NAS North Island, Silver Strand State Beach [Ocean], SSTC, Saltworks, and NAB

Coronado [Bay]) (NAVFAC Southwest and Port of San Diego 2011). Navy 2012 surveys to date show that there are 22 active nests on the beach southeast of the North Island airfield and that three of the five nests located on the airfield have been collected to protect the snowy plovers (NAB Coronado 2012).

An estimated 70 percent of the snowy plover population migrates in the winter; the remainder are present year-round. The San Diego Bay area also serves as the over-wintering grounds for plovers from Monterey Bay and Oregon and now holds much of the remaining nesting grounds for snowy plovers in Southern California. As its natural nesting areas have come under development or heavy human usage, the undeveloped Naval training beaches have become increasingly important for this species locally (NAVFAC Southwest and Port of San Diego 2011). There is no designated critical habitat within or adjacent to the project area; the closest designated critical habitat is on the southeast side of North Island at Coronado Beach, 2.5 mi to the southeast (USFWS 2012). Snowy plovers are not known or likely to use the small areas of beach near the proposed project.

3.5.3 Environmental Consequences

3.5.3.1 Approach to Analysis

The analysis identifies the potential significance of impacts to threatened and endangered species based on: (1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; (2) the proportion of the resource that would be affected relative to its occurrence in the region; (3) the sensitivity of the resource to proposed activities; and 4) the duration and ecological ramifications of the impact. For example, an impact would be considered significant if it would permanently reduce the population size or distribution of a protected species.

3.5.3.2 Avoidance and Minimization Measures

The following avoidance and minimization measures would be utilized during the proposed activities to reduce the potential to impact threatened and endangered species:

1) Dredging and other in-water demolition or construction would not occur during the endangered California least tern breeding season (1 April – 15 September).

2) The Navy would continue to follow the conservation measures established in the current Tern MOU (Appendix E.2).

3) In conjunction with marine mammal monitoring (Section 3.4.3.2) (currently part of the Navy's IHA application), qualified observers will also search for and document any occurrence of sea turtles within areas of potential effect or interaction with the project. During pile driving/extraction activities, monitoring will extend to the limit of potential Level B behavioral harassment, specifically to the underwater 160 dB re 1 μPa (rms) isopleth for impact pile driving; and for vibratory pile driving or extraction, to either the underwater 120 dB re 1 μPa (rms) isopleth or to the point at which project sound becomes indistinguishable from background noise (maximum project sound SPL (rms) ≤ median ambient rms), whichever is less. A 10-m buffer zone will also be monitored

during other in-water operations of equipment and vessels. Monitoring will commence at least 15 minutes prior to the activities.

4) If any sea turtle is seen within these visual ranges prior or during the corresponding activity, the activity would not commence until the animal has moved out of the area or at least 15 minutes has passed since the last such sighting.

5) Programmatically, the Navy will continue to consult informally with NMFS on sea turtle occurrence and Navy construction activities and facilities projects throughout San Diego Bay to identify any risks that could negatively impact sea turtles.

3.5.3.3 Alternative 1 Pier Replacement and Associated Dredging

California Least Tern

Most of the proposed project (i.e., the existing fuel pier, the proposed fuel pier, the proposed dredging area, and the proposed temporary Navy MMP relocation site) is located within a breeding area identified in the existing Tern MOU between the USFWS and U.S. Navy (Figure 3.5-1, Appendix E.2). Various studies have confirmed that terns forage in both shallow and deep water habitats, although studies conflict as to whether artificial structures attract or deter tern breeding (USACE 2009, NAVFAC Southwest and Port of San Diego 2011). The nearest nesting habitat areas are across the bay, on the western edge of North Island, approximately 700 m east of the dredging footprint.

Conservation measures established in the MOU Between U.S. Fish and Wildlife Service and the U.S. Navy Concerning Conservation of the Endangered California Least Tern in San Diego Bay, California (refer to Appendix E.2) would be followed, resulting in the avoidance of noise- and turbidity-producing in-water activities in designated least tern breeding habitat, which includes the project area, from 1 April through 15 September, when least terns are present nesting and breeding in San Diego Bay. No persistent effects on breeding conditions are expected once in-water construction/demolition activities are halted. At other times, the onshore noise and activity associated with the project would be similar to ongoing activities at NBPL and not expected to affect least tern breeding in the adjacent waters. There would be no effect on least tern nesting colonies, the nearest of which is across the bay at North Island. Based on this analysis, the Navy has concluded that Alternative 1 may affect, but is not likely to adversely affect, the California least tern. The Navy made a no effect determination on the California least tern as full compliance with the MOU would occur. There would be no significant impact on the California least tern.

The proposed relocation of the bait barges as well as sediment disposal at the SSTC reuse site would occur outside of the least tern nesting season and would thus have no effect on the species.

Green Sea Turtle

Potential impacts to green sea turtles would primarily be from noise generated during demolition, construction, or dredging activities. In-water activities would only overlap the tail end of the warm-water period when sea turtles are most likely to move through the project area

(NAVFAC Southwest and Port of San Diego 2011). In any case, proposed monitoring would limit the potential exposure of sea turtles to underwater sound and in-water activities, and sea turtles would be able to detect and avoid these activities.

No sea turtle habitat would be impacted by any project activities and all avoidance and minimization measures described in Section 3.5.3.2 would be implemented to avoid potential impacts to green sea turtles from pile driving activities. Although there are no empirical data on the effects of pile driving on sea turtles, NMFS has identified impact pile driving underwater sound criteria for sea turtles as 190 dB re 1 μPa (rms) for Level A physiological effects, and 160 dB re 1 μPa (rms) for Level B behavioral effects. For vibratory pile driving, NMFS criteria are 190 dB rms for Level A and 120 dB re 1 μPa (rms) for Level B. However, sea turtles are not expected to occur in northern San Diego Bay during the fall-winter timing of in-water construction/demolition and pile driving activities. Furthermore, any sea turtles present in the general vicinity would be able to detect the noise and associated in-water activities and may avoid the project area during project activities. Although it is unlikely that a sea turtle would move within a distance of potential Level B effect, sound generating activities would cease upon detection. Therefore, the Navy has concluded that Alternative 1 may effect, but is not likely to adversely effect, the green sea turtle. The Navy consulted informally with NMFS to request concurrence with this conclusion and NMFS concurred (refer to Appendix A). There would be no significant impact on the green sea turtle.

Western Snowy Plover

Since the western snowy plover is not known or expected to occur in the San Diego Bay project area, and since the nearby sandy beach would not be used for any project-related purpose, there would be no effect on individuals or potential habitat for this species in San Diego Bay. Nearshore sediment disposal at the SSTC reuse site would occur 1,000-2,000 ft offshore, and thus have no effect on snowy plovers that may be present on the beach. Therefore, the Navy made a no effect determination on western snowy plovers and no consultation is required. There would be no significant impact to western snowy plovers.

Other Special Status Species

The project sites are not in proximity to important breeding, resting, or nesting areas for bird species, and similar habitats are abundant throughout San Diego Bay. Potential disturbance of shoreline and adjacent open water areas that may be used on a transient basis by sensitive water and shore bird species would be short-term and less than significant. No impacts are anticipated from the temporary relocation of the bait barges within the same deep subtidal habitat. Noise generated during demolition, construction, and dredging activities would not substantially increase noise levels. Additionally, these increases in noise and activity would not vary substantially from normal levels of activity, vehicular traffic, and marine vessels operating in the immediate area and would cease upon completion of demolition, construction, and dredging activities. Therefore, there would be no adverse effect on these species' populations or habitats as a result of Alternative 1.

3.5.3.4 Alternative 2 Delayed Dredging Alternative

Alternative 2 would have the same impacts and the same avoidance and minimization measures as Alternative 1, although the impacts associated with dredging would occur separately from those associated with the other project components since the dredging would only take place after the new fuel pier construction was completed. Therefore, there would be no significant effects on threatened and endangered species as a result of Alternative 2.

3.5.3.5 Mitigation Measures

Because potential impacts to threatened and endangered species would be localized, would cease upon completion of project activities, and would not be significant under either Alternative 1 or Alternative 2, no mitigation measures are proposed.

3.5.3.6 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, amendments to the existing navigation Security Zones, temporary relocation of the Everingham Bait Brothers Company bait barges, demolition and replacement of the existing fuel pier, and associated dredging of the turning basin would not occur. Existing conditions would remain unchanged. Therefore, implementation of the No-Action Alternative would not have a significant impact to threatened and endangered species.

3.6 WATER RESOURCES

3.6.1 Definition of Resource

Water quality describes the chemical and physical composition of water as affected by natural conditions and human activities. Water resource regulations focus on the right to use water and protection of water quality. The principal federal laws enforced by the U.S. Environmental Protection Agency (USEPA) to protect water quality are the CWA, as amended (33 USC § 1251 *et seq*.), and the Safe Drinking Water Act (42 USC § 300f *et seq.*). The CWA provides protection of surface water quality and preservation of wetlands. Section 404 of the CWA regulates discharge of dredged or fill material in waters of the U.S. (USEPA 2005). The Marine Protection, Research, and Sanctuaries Act (also known as the Ocean Dumping Act) governs transportation of materials for the purpose of disposal into ocean waters (USEPA 2005). The Safe Drinking Water Act is directed at protection of drinking water supplies. At the state level, the Porter-Cologne Water Quality Control Act (California Water Code §§ 13000-13999.10) gives the State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCBs) responsibilities for protection of the waters within their regions. The regional boards are also responsible for implementing provisions of the CWA delegated to states, such as the National Pollutant Discharge Elimination System (NPDES), which regulates point (industrial) and non-point (stormwater) sources of pollutants, and Section 401, which requires certification that discharges to water bodies comply with state water quality standards.

In the Water Quality Control Plan for the San Diego Basin (Basin Plan), the California RWQCB, San Diego Region, designated beneficial uses for the surface and ground waters in the San Diego Region, including San Diego Bay (RWQCB 1994). Beneficial uses are defined as the uses of water necessary for the survival or well-being of man, plants, and wildlife, and are protected against degradation of their quality under the state Porter-Cologne Act (RWQCB 1994). Examples include drinking, swimming, industrial, and agricultural water supplies, and the support of fresh and saline aquatic habitats. Specific beneficial uses established for San Diego Bay include the following (RWQCB 1994): Industrial Service Supply; Navigation; Contact Water Recreation; Non-contact Water Recreation; Commercial and Sport Fishing; Preservation of Biological Habitats of Special Significance; Estuarine Habitat; Wildlife Habitat; Rare, Threatened, or Endangered Species; Marine Habitat; Migration of Aquatic Organisms; and Shellfish Harvesting. The Basin Plan sets objectives for water quality that must be maintained to protect the designated beneficial uses of water resources in the San Diego region and conform to the state's antidegradation policy. The California Ocean Plan establishes limits or levels of water quality characteristics for ocean waters to ensure the reasonable protection of beneficial uses and the prevention of nuisance (SWRCB 2005).

3.6.2 Affected Environment

The following section describes existing conditions for water resources at the proposed project site located in San Diego Bay. The region of influence (ROI) for water resources for the proposed project is San Diego Bay.

3.6.2.1 Existing Conditions

San Diego Bay is a narrow, crescent-shaped natural embayment oriented northwest to southeast with an approximate length of 15 mi (Port of San Diego 2007). The width of the bay ranges from 0.2 to 3.6 mi, and depths range from -74 ft MLLW near the tip of Ballast Point (see Figure 1-1) to less than four ft at the southern end (Merkel & Associates, Inc. 2009). About half of the bay is less than 15 ft deep and most of it is less than 50 ft deep (Merkel & Associates, Inc. 2009).

On average, the San Diego region receives 10 inches of rainfall per year, occurring mostly between November and March (Port of San Diego 2007). Seasonal inputs of freshwater from the land to the east are conveyed to the bay through the three sub-watersheds of the San Diego Bay watershed (Port of San Diego 2007). The Pueblo San Diego sub-watershed encompasses the northern portion of the bay including the project area. This sub-watershed has the smallest drainage area, but is the most densely developed and populated because it includes the City of San Diego (Port of San Diego 2007). Freshwater contribution to the Bay comes primarily from the Otay and Sweetwater Rivers in the south portion of the Bay, and secondarily from Chollas and Paleta Creeks in the central portion (USACE 2009). For approximately 9 months of the year, the Bay receives no significant amount of fresh water input. The fresh water that does flow into the bay is limited to surface runoff from urban areas (e.g., the over 200 storm drains and intermittent flows from the rivers and creeks after storms) (USACE 2009). Surface water on the Point Loma peninsula comprises ephemeral drainages that convey water to the bay or ocean directly after rain events. In the northern, developed urban portion of the peninsula, seasonal runoff flows to the ocean via gutters and storm drains. Some of the natural drainage pattern remains in the undeveloped western and southern portions (Figure 1-2). West (upslope) of the project site, runoff is diverted to containment basins and concrete channels to prevent contact with potential contaminants at the NBPL DFSP fuel storage facilities before outflow to the bay (Navy 2007).

Bathymetry and Circulation

The northern and central portions of the bay have been shaped by historic dredging to support large ship navigation, and filling (Merkel & Associates, Inc. 2009). Only the far southern portion retains its natural shallow bathymetry (Merkel & Associates, Inc. 2009). The bathymetry and bedform of the bay are defined by a main navigation channel that steps up to shallower dredged depths toward the sides and bottom of the bay (Merkel & Associates 2009). USACE dredges the navigation channel to maintain it a depth of -47 ft MLLW (NOAA 2012). Outside the navigation channel, the bay floor consists of platforms at depths that vary slightly (Merkel & Associates 2009). Within the north bay, typical depths range from -36 to -38 ft MLLW to support large ship turning and anchorage (Merkel & Associates, Inc. 2009). Small vessel marinas are typically dredged to depths of -15 ft MLLW (Merkel & Associates, Inc. 2009).

Bathymetry at the proposed project site has been altered by filling and dredging as well. The quay wall at the fuel pier has been artificially filled to its elevation of approximately +12 ft MLLW (Terra Costa Consulting Group, Inc. 2010). The bay bottom on the south side of the fuel pier approach segment has been dredged to a depth of about -20 ft MLLW, while the bathymetry of the north side retains a more gradual downward slope to the east. Beneath the fuel pier itself, the bottom was protected from historical dredging by the pier pilings and thus stands several feet higher than immediately adjacent depths (Terra Costa Consulting Group, Inc. 2010, NAVFAC 2009a). Beyond the fuel pier headline, the bottom drops sharply to -30 ft and then -40 ft, the result of dredging. Bayward (east) of the headline, most of the bathymetry out to the navigation channel is at least -41 ft MLLW. However, there is one wedge-shaped high spot along the western edge of the navigation channel where bottom depths rise from -40 to -36 ft MLLW (see Figure 2-6).

Circulation within San Diego Bay is affected by the bay's crescent shape and narrow bay mouth, tides, and seasonal salinity and temperature variations (Port of San Diego 2007). San Diego Bay can be divided into four regions based upon circulation characteristics. The North Bay – Marine Region extends from the bay mouth to the area offshore from downtown San Diego. Tidal action has the greatest influence on circulation in this area where bay water is exchanged with sea water over a period of two to three days (Port of San Diego 2007). The North-Central Bay – Thermal Region runs from the north bay to Glorietta Bay (south of Coronado Island). In the Thermal Region, currents are mainly driven by surface heating (Port of San Diego 2007). The incoming tide brings cold ocean water from deeper areas, which is then replaced with warm bay surface water when the tide recedes. These tidal processes lead to strong vertical mixing (Port of San Diego 2007). The region between Glorietta Bay and Sweetwater Marsh is characterized as the South-Central Seasonally Hypersaline (i.e., higher salt content than seawater) Region. Here, variations in salinity due to warm-weather evaporation at the surface separate the water into upper and lower zones driven by density differences (Port of San Diego 2007). The South Bay estuarine region south of Sweetwater marsh receives occasional freshwater inflows from the Otay and Sweetwater Rivers (Port of San Diego 2007). Residence time of bay water in the estuarine region may be greater than 1 month (Port of San Diego 2007). Common salinity values for the bay range from 33.3 to 35.5 practical salinity units for the bay mouth and the south bay, respectively (Chadwick *et al.* 1999).

San Diego Bay has mixed diurnal/semi-diurnal tides, with the semi-diurnal component being dominant (Largier 1995). The interaction between these two types of tides is such that the higher high tide occurs before the lower low tide, creating the strongest currents on the larger ebb tide (Largier 1995). The tidal range (difference between MLLW and mean highest high water) is about 5.5 ft (Largier 1995). In general, tidal currents are strongest near the bay mouth, with maximum velocities of 1.6 to 3.3 ft per second (Largier 1995). Tidal current direction generally follows the center of the bay channel (Chadwick *et al.* 1999). Residence time for water in the bay increases from approximately five to 20 days in mid-bay to over 40 days in south bay (Chadwick *et al.* 1999). During an average tidal cycle, about 13 percent of the water in the bay mixes with ocean water and then moves back into the bay (Port of San Diego 2007). The complete exchange of all the water in the bay can take 10 to 100 days, depending on the amplitude of the tidal cycle (Port of San Diego 2007). Tidal flushing and mixing are important in maintaining water quality within the bay. The tidally-induced currents regulate salinity, moderate water temperature, and disperse pollutants (Port of San Diego 2007).

<u>Marine Water Quality</u>

San Diego Bay

Before the 1960s, San Diego Bay was one of the most polluted harbors in the world. This was due to over 70 years of discharge of raw sewage and industrial waste as the population of the City of San Diego increased and became a major harbor for the U.S. Navy and civilian commerce (Chadwick *et al.* 1999). In 1963, the City of San Diego constructed its Wastewater Treatment Plant on the west side of the Point Loma peninsula to properly treat sanitary sewage before ocean discharge via an offshore pipeline. Use of the treatment plant and elimination of industrial discharges in the 1970s resulted in rapid water quality improvements in the bay (Port of San Diego 2007).

Water quality is commonly assessed by measuring dissolved nutrients, dissolved oxygen, pH, turbidity, chlorophyll *a,* and coliform bacteria (Chadwick *et al.* 1999). Measured values for dissolved nutrients in San Diego bay such as phosphate and silicates range from 0.9 to 4 parts per million (ppm) for silicon and 0.02 to 0.3 ppm phosphorus in the winter, to 0.3 to 1.3 ppm for silicates and 0.2 ppm phosphorus in the summer (Chadwick *et al.* 1999). This variation is the result of inflow of these nutrients with winter runoff, and uptake by phytoplankton growth in the summer (Chadwick *et al.* 1999). Dissolved oxygen levels range from about 4 (summer) to 8 milliliters (ml) per liter (winter) (Chadwick *et al.* 1999). These oxygen levels are typically at or near atmospheric equilibrium levels. The pH of seawater in San Diego Bay is relatively uniform, ranging from about 7.9 to 8.1 throughout the bay and the year (Chadwick *et al.* 1999).

Turbidity is a measure of water clarity or murkiness, and can be caused by suspended sediments transported in runoff or increased algal/bacterial growth (TDI 2010). Turbidity can also be created by natural and man-made resuspension of bottom sediments. Bottom sediments are resuspended by the action of tides, winds, and movements of ships with drafts deeper than 22 ft in the shallow waters of the south bay around Naval Base San Diego (NBSD) (Chadwick *et al*. 1999). Increased turbidity reduces the amount of light available for plant growth underwater, so it can affect the entire ability of the Bay to support living organisms (TDI 2010). Turbidity in San Diego Bay varies, depending on the tides, seasons, and location within the Bay (TDI 2010). The monthly average for the northern portion of the bay varies from approximately 1.0 to 3.7 nephelometric turbidity units (NTU) (TDI 2012). The Basin Plan sets limits for allowable increases in turbidity over existing conditions (RWQCB 1994).

Chlorophyll *a* (a measure of the amount of phytoplankton present in the bay) ranges from 0.2 to 25 micrograms per liter (Chadwick *et al.* 1999). The highest values were measured in the south bay in winter, when runoff carries high levels of nutrients into the south bay. In summer, chlorophyll *a l*evels return to background levels of 1 to 2 micrograms per liter. These chlorophyll *a l*evels are generally much higher than those found in the adjacent open ocean. Before 1964, when untreated sewage was still being discharged into San Diego Bay, bacterial counts (fecal coliform) were as high as 82 per milliliter in the south bay (Chadwick *et al.* 1999). Since these discharges ended, bacterial counts typically remain below 10 per milliliter except during some winter storms. These levels are below federal limits for water contact, implying that the bay is generally safe for recreational use (Chadwick *et al.* 1999).

Current sources of pollution to the bay include underground dewatering, industries on the bay and upstream, marinas and anchorages, DoD and Department of Homeland Security (DHS) activities, materials used for underwater hull cleaning and vessel antifouling paints, and urban runoff (Chadwick *et al.* 1999). Additional pollution sources include creosote-treated wood pier pilings, which are a source of polycyclic aromatic hydrocarbons (PAHs), stormwater runoff from land used for industrial, commercial, and transportation purposes, bilge water discharge, and oil spills (Chadwick *et al.* 1999). Recent changes in Navy procedures have included replacing approximately half of the pier pilings with plastic, concrete, or untreated wood, and eliminating bilge water inputs (Chadwick *et al.* 1999). Overall, the levels of contamination in the water and sediment in San Diego Bay appear to be lower now than in decades past, including levels of some metals and PAHs (Port of San Diego 2007). However, copper concentrations remain routinely higher than federal and state limits for dissolved copper (Port of San Diego 2007).

Silver Strand Training Complex Sediment Beneficial Reuse Site

The beneficial reuse site is located offshore of SSTC beach, approximately 3 miles southeast of Zuniga Jetty along the Pacific Coast. The dredged sediment would be discharged in water of depths between -25 and -35 ft MLLW, within areas of approximate dimensions 2,800 ft long by 1,000 ft wide, approximately 64 acres (Figure 2-10).

The nearshore receiver site is within the Silver Strand Littoral Cell (Navy 2011). The Tijuana River historically delivered a steady supply of sand from the from the south, which was moved northward to the Silver Strand beaches by longshore currents (Navy 2011). Silver Strand Peninsula, a sand spit deposited by a northward-bound eddy of the coastal current on the west, separates San Diego Bay from the Pacific Ocean. Since the Tijuana River was dammed in 1937 the supply of sediment to the coastline has diminished by 70 percent (Navy 2011). Beaches south of Coronado (i.e., SSTC Beach) have become severely eroded by waves and wave-driven currents (Navy 2011, USACE 2012). The P-151 sediment reuse site is approximately 1,000 ft south of a site where the USACE proposed to discharge clean sediment from their San Diego Harbor Maintenance Dredging Project for beneficial reuse for beach replenishment (Figure 2-10) (USACE 2009, 2012).

Ocean water quality monitoring conducted by the City of San Diego indicates that water quality offshore of Silver Strand is generally good. Occasional water poor quality/elevated bacteria levels associated with heavy storm runoff and sewage spills caused multiple closures of neighboring Breakers Beach at NAS North Island and Silver Strand State Beach from 2004 through 2006 (Navy 2011). Natural conditions such as thermal stratification, upwelling, tides and currents; surface runoff and river discharges; as well as wastewater discharges affect ocean water quality offshore of the Silver Strand peninsula (Navy 2011). Dissolved oxygen ranges from 5.0 to 11.6 milligrams per liter (mg/L) throughout waters offshore of southern California. Ocean surface water dissolved oxygen was measured at 7.8 mg/L and 8.3 mg/L; dissolved oxygen measured at the bottom was 8.6 mg/L. The concentration of dissolved oxygen is generally higher in surface and nearshore waters as a result of continuous wave action and atmospheric mixing. Salinity has been fairly constant in Southern California waters, in the range of 32 to 34 parts per trillion, and tends to be homogeneous throughout the water column (Navy 2011). Pacific Ocean waters offshore of Silver Strand tend to have higher-than-average levels of total suspended solids (TSS, a measure of turbidity). In 2002, TSS offshore of Silver Strand was measured in the range of 11.5 to 23.2 mg/L in 2002 (Navy 2011). Silver Strand offshore waters typically have low levels of oil and grease. Above-average concentrations of semi-volatile organic compounds (i.e., PAHs) and some metals (aluminum, arsenic, chromium, copper, iron, manganese, and zinc) have been detected in sample from sediments collected offshore from the SSTC–North beach (Navy 2011). However, the detected contaminants are not at concentrations that pose a risk to public health or the environment (Navy 2011).

Surface Water Quality

Fuel Pier

Stormwater runoff from the fuel pier is regulated as an industrial discharge under NBPL's NPDES Permit (Permit No. CA 0109363 Order No. R9-2002-0002) (RWQCB 2002a). This permit prohibits the discharge of wastes including water contaminated with oils, fuels, lubricants, solvents, and oily bilge water (RWQCB 2002a). The NPDES permit states that the discharger (i.e., NBPL and the fuel pier) shall not cause pollution, contamination, or nuisance, and the discharge of wastes shall not cause or contribute to an exceedance of any applicable State or San Diego regional water quality objective or standard (RWQCB 2002a). The NPDES permit also regulates discharges from miscellaneous point source associated with the fuel pier: miscellaneous (potable water and fire system maintenance) (RWQCB 2002b).

To fulfill the requirements of the NBPL NPDES permit, NBPL has implemented a Stormwater Discharge Management Plan (NAVFAC Southwest 2009). This Plan includes Basewide and facility-specific Best Management Practices (BMPs) for preventing and minimizing contact of stormwater with potential pollutants that are present at the fuel pier. The Basewide BMPs include restricting access, regular cleaning and sweeping, controlling spills and reducing waste, avoiding hosing down the site, and regular inspection and maintenance of the storm drain system (NAVFAC Southwest 2009). The BMPs specific to operations at the fuel pier include: the pier perimeter where fueling operations take place has an 8-in high concrete containment berm; drainage ports in the pier deck are covered during fueling operations to prevent pollutants, in the event of a spill, from entering San Diego Bay; drip pans are used to contain leaking fluids from valves and piping until leaks are repaired; fill pipes are protected by berms from potential vehicle damage; spill kits are provided to mitigate liquid spills; and an oil containment boom surrounds the entire fuel pier (NAVFAC Southwest 2009). The floating boom is extended to surround vessels while they are berthed at the pier as well (Navy 2010a). To further minimize impacts of potential spills, additional absorbent booms, three boats to deploy them, and an oil skimmer boat are kept on the quay wall south of the fuel pier at all times (Navy 2010a). A vacuum truck is generally staged at the foot of the fuel pier as well (NAVFAC 2009). Implementation of the Basewide and site specific BMPs, and compliance with the NPDES permit ensure that ongoing fuel pier operations do not result in significant impacts to surface water. No NPDES permit violations were issued to NBPL DFSP at the fuel pier in the period from January 2004 through November 2010 (RWQCB 2011).

NMAWC Site

NMAWC is covered under NBPL's NPDES Permit but does not have any permitted industrial related discharges (NAVFAC Southwest 2012).

3.6.3 Environmental Consequences

3.6.3.1 Approach to Analysis

Water quality impacts are evaluated based on the potential for a substantial increase in turbidity, discharge of suspended sediments, or discharge of contaminants that exceeds federal or state water quality standards or objectives. Impacts to water resources would occur if implementation of the Proposed Action would cause major changes to bathymetry; alter or obstruct patterns of circulation in San Diego Bay; substantially degrade surface water, groundwater, or marine water quality or cause impairment to beneficial use.

3.6.3.2 Alternative 1 Pier Replacement and Associated Dredging

<u>Bathymetry and Circulation</u>

Pier Demolition

No dredging is needed near the fuel pier itself (only in the high spot in the turning basin) so there would be no changes to bathymetry at the existing pier site. A remnant soil mound (created by historical dredging of the bay floor adjacent to the fuel pier) lies beneath the existing fuel pier (Terra Costa Consulting Group, Inc. 2010). The height of the soil mound varies from approximately elevation -1 ft (MLLW) under the approach segment at the shoreline, to approximately elevation -8 ft (MLLW) near the in the center of the main pier, and -10 ft below the south segment and -20 ft beneath the north (Terra Costa Consulting Group, Inc. 2010). Sheet pile bulkheads that protrude 10 ft above the mudline would be left in place beneath the north and approach segments, which would preserve the soil mound beneath. Vessels berthing at the new fuel pier would be operating approximately 300 ft east of the old pier berthings, so the old sheet piles, pile stubs, and remnant bathymetry would not affect navigation uses.

Demolition of the existing fuel pier would the use of a vibratory hammer and/or jetting outside the least tern breeding season (1 April through 15 September). The pier piles would be pulled with a crane or clam shell dredge bucket used as a crane. Barges, tugs, and other vessels would move about the work area. All these operations would increase water movement in the area where the removal occurs, but the effect would be strictly limited to the duration of the demolition period and work area. As stated in Section 3.6.2.1, the primary mechanisms controlling circulation in San Diego bay are tidal currents and seasonal variations in temperature and salinity. Small-scale, localized increases in water movements would not be expected to have a significant effect on bay circulation. The sheet pile bulkheads would remain in place so the absence of the individual piles would represent a negligible change from existing conditions. Because water already circulates freely around the bulkheads and the individual pilings, this change would not have a significant impact to circulation in the Bay overall. Therefore, impacts to bathymetry and circulation associated with demolishing the existing fuel pier would not be significant.

Pier Construction

There would be no dredging or other changes to bathymetry at the proposed new pier construction site. Construction of the new fuel pier would require installation of approximately 554 structural and fender piles. The first 400 ft of the new pier approach segment would be constructed within 5 ft of the existing fuel pier approach. As such, this segment of the new pier would not represent a change from existing conditions with regard to circulation. The new pier approach segment would extend about 250 ft bayward (east) beyond the old pier, where the 1,100 ft-long berthing segment would be located. Throughout the new pier structure, pier pilings would be spaced 10 ft apart. This spacing would be wide enough so that the new pier would not form a barrier to local circulation. Construction of the new fuel pier would involve the use of barges, tugs, other vessels that would move about the work area, and jetting, a vibratory hammer and a diesel hammer to install the piles. These operations would increase water movement in the area where the construction occurs, but the effect would be strictly limited to the duration of the construction period and work area. Therefore, impacts to the bathymetry and circulation of the bay overall associated with pier construction would not be significant and existing patterns of circulation would continue.

Turning Basin

The sediments in the dredge footprint generally consist of a 0.5 to 1 ft layer of fine sand and silty sand (bay/beach deposits) overlying medium and coarse grained sand with shell fragments (Bay Point Formation) (Sampling and Analysis Report for Naval Base Point Loma Fuel Pier Replacement and Dredging [Navy Military Construction Project P-151] in Appendix D). The Bay Point Formation is native material that was deposited in the San Diego area near the end of the last ice age (more than 10,000 years ago) (USACE 2009). The bay/beach deposits are sediments transported by current movements in the Bay (USACE 2009).

The wedge-shaped high spot in the turning basin adjacent to the west of the navigation channel would be dredged to a depth of -40 ft MLLW, removing the bay/beach deposits and several feet of Bay Point Formation. Most of the area surrounding the dredge footprint is already deeper than -40 ft MLLW (see Figure 2-6) due to historical dredging. Reducing the high spot in the turning basin to a depth similar to existing surrounding depths would not be a major change to bathymetry. The dredging operations would temporarily increase water movement in the area where dredging is taking place, but the effect would be strictly limited to the duration of the dredging period and work area. The minor changes to bathymetry would not be sufficient to affect circulation patterns in the Bay. Therefore, dredging associated with Alternative 1 would not have a significant impact to bathymetry and circulation.

Silver Strand Training Complex Sediment Beneficial Reuse Site

Changes to the existing bathymetry of the beneficial reuse site should be expected as a result of the Proposed Action. Sediment deposited in the nearshore zone at the replenishment site would be gradually reworked by the forces of wave action, longshore currents, and seasonal storms into offshore sandbars and the natural beach profile. Placement of the dredged sediment at the receiver site would help remedy erosion at the SSTC beach. Therefore, it is anticipated that use of the dredge sediments for nearshore replenishment would be a beneficial impact.

Temporary Relocation of the Navy MMP

Temporary relocation of the Navy MMP would not involve dredging, filling, or other alteration of the bay bottom so there would be no changes to bathymetry at either the existing Navy MMP or proposed temporary relocation site. The Navy MMP marine mammal enclosures consist of floating walkways and enclosures (wide-mesh nets) anchored to concrete guide piles (Moffatt & Nichol-Blaylock [MNB] 2011). The guide pile spacing and floating walkways, and enclosures at the existing location permit free movement of water through this area. Removal of the floating walkways and enclosures would not affect circulation at the existing site; the guide piles would be left in place to re-anchor the floating facilities after the temporary relocation period.

Some guide piles and walkways are already in place at the NMAWC site. However, 32 of the existing guide piles would be removed and relocated, and 46 new guide piles and additional floating walkways would be installed. Guide piles are assumed to be required at a minimum of approximately 30 ft on centers along the floats; certain configurations could require additional guide piles between enclosures (MNB 2011). The Navy MMP activities while at the temporary NMAWC site would include housing and training the animals, and cleaning the animals' enclosures and Navy MMP vessels with potable water. Such activities would not involve alteration of the bay bottom, so there would be no effect on bathymetry. At the end of the 4-year temporary relocation period, the temporary guide piles would be removed. The piles would be extracted entirely or cut at the mudline, with no change to the bay bottom surface (i.e., no high spots that would pose a navigation hazard).

With respect to circulation, there would be minor, localized increases to circulation caused by vessel movement and in-water construction and demolition; these increases would cease when each particular activity ends. The temporary in-water facilities to be installed at NMAWC site - guide piles, floating walkways, and enclosures – would be similar to those already in place at the site. The only change from the existing condition would be the addition of the animal enclosures (wide-mesh floating nets). By their nature these in-water structures – guide piles spaced 30 ft apart, floating walkways and wide-mesh nets, would not create a barrier or diversion to water circulation. The Navy MMP in-water activities while at the temporary relocation site, as described in the preceding paragraph, would involve the use of high-pressure hoses for cleaning, and small boats for animal training. This equipment would not generate wakes or turbulence sufficient to affect the natural tidal-controlled flow of water in San Diego Bay. As described in the preceding paragraph, the Navy MMP marine mammal facilities would be removed from the NMAWC site after the 4-year temporary relocation period and the site would return to its existing condition i.e., the marina facilities consisting of guide piles and floating walkways. The physical changes to the NMAWC site and the activities that would occur there during the temporary relocation of the Navy MMP would not obstruct the flow of water or create artificial currents, so there would be no significant impact to circulation.

Therefore, as detailed in the preceding paragraphs, the proposed temporary relocation of the Navy MMP to the NMAWC site as described above would not have a significant impact to bathymetry and circulation.

Proposed Temporary Relocation of Everingham Brothers Bait Company Bait Barges

Temporary relocation of the bait barges does not involve dredging or other alteration of the bay bottom so there would be no changes to bathymetry at either the existing or the temporary relocation site. The bait fish are held in enclosures that have 1-in wide slots on the sides allowing sea water to flow through freely. Thus, temporary relocation of the bait barges to the would not have a significant impact to bathymetry and circulation.

In summary, limited dredging would occur in a portion of the existing turning basin, and pier piles would be installed in areas where piles already exist. Temporary relocation of the Everingham Brothers Bait Company Bait Barges would not involve alternation of the bay bottom or obstruct the free flow of water. For the reasons stated above (the dredging would level a high spot in the turning basin), piles would be spaced at a sufficient distance to allow free movement of water) implementation of Alternative 1 would not have a significant impact to bathymetry and circulation.

<u>Marine Water Quality</u>

Pier Demolition

The Navy would require the contractor to prepare and implement a comprehensive debris management plan that would address the types of construction and demolition debris, expected separation and retrieval methods, and disposal methods. The contractor would be required to use catch devices and sheeting to capture and contain debris and materials that may be produced by project activities. The selected contractor would be required to implement BMPs to meet USACE and RWQCB permit conditions. Accidental releases of debris to San Diego Bay would be prevented by placing floating booms around the site to provide a complete barrier to floating debris. Debris from work on demolition and construction barges would also be captured on-board the barges. All captured material would be swept and disposed of in accordance with the debris management plan.

Before demolition begins, the contents of each fuel pier pipeline would be pumped out and each pipeline would be disconnected from the fuel supply. All fuel dispensing ports would be sealed, and each pipeline would be flushed with high-pressure water. The water from flushing the pipelines would be treated at the NBPL DFSP Fuel Oil Reclamation (FOR) system. Sanitary sewage pipelines would also be flushed with high pressure water, which would be pumped to the NBPL sanitary sewer system for discharges. Flushing the pipelines would minimize accidental release of pipeline residue during demolition activities.

The contractor would coordinate their activities with Navy FLC DFSP Fuel Pier personnel to avoid potential accidents. The Navy maintains detailed plans to prevent fuel spills at DFSP Point Loma and to respond in the event spills do occur. State regulations mandate that the operator of a bulk fuel facility such as NBPL must prepare an Integrated Contingency Plan (ICP) in accordance with the guidelines of 40 CFR 112.7. The Navy has prepared an ICP for the fuel facility at Point Loma, which was last updated in 2009. The ICP is DFSP Point Loma's in-depth response plan that addresses all aspects of an oil spill response, including organization, assessment, recommended cleanup methods, environmental considerations, establishment of priorities, training, preventive maintenance, and other required items. The current ICP complies with the requirements of federal and state regulatory agencies overseeing DFSP Point Loma, including the USEPA, USCG, CSLC, and California Office of Spill Prevention and Response. The NBPL Emergency Response Action Plan and the "Red Plan" form the first 26 pages of the ICP and are followed for immediate action in the event of an oil or hazardous substance release.

Per the NBPL Emergency Response Action Plan (a subsection of the ICP), any petroleum release or petroleum sheen observed on the water surface would be reported to National Response Center and other agencies as required. Booms and other spill containment equipment kept on hand would be immediately deployed, the source of the release would be determined and secured, and cleanup measures appropriate to the nature and extent of the spill would be implemented (Red Plan-pages 1-3.). These procedures would minimize the potential for contaminants related to project activities to enter or spread in marine waters.

Vessel movement associated with demolition activities, jetting, and extraction of the existing piers would cause disturbance of bottom sediments and increased turbidity as a result of sediment resuspension. To limit sediment disturbance and turbidity, the sheet pile bulkheads would be left in place beneath the north and approach segments. Increased turbidity due to demolition would be localized to the fuel pier area and would return to background conditions within an hour after the pile removal or installation activity ends (AMEC Earth & Environmental, Inc. [AMEC] 2008).

Sediment Quality

Testing at the P-151 fuel pier project area and the proposed NMAWC temporary Space and Naval Warfare Systems Center (SSC) MMP relocation footprint was conducted by the Navy in January 2013 to investigate sediment quality, and evaluate the potential impacts from disturbance and suspension (NAVFAC Southwest 2013a). The sampling methodology and complete analytical results are presented in the Final Report *Naval Base Point Loma Fuel Pier and SSC Marine Mammal Relocation Area Sediment Quality Investigation San Diego Bay, San Diego, California Prepared for Naval Facilities Engineering Command Southwest by Tierra Data, Inc., March 2013* ([NAVFAC Southwest 2013a] available upon request from the NBPL Public Affairs Officer). Information within this subsection is summarized from this document.

Within each project footprints, sediment samples were collected from three separate locations. For analytical purposes, the three samples from the fuel pier area were combined into one composite and the three samples from the proposed NMAWC footprint were combined into a second composite.

The two lines of evidence necessary to assess the potential for impact to marine organisms are: (1) the physical properties of the sediment, and (2) the concentrations of contaminants in the sediment. The ability for the sediment to bind to contaminants is a function of size, with smaller particle sized diameters (less than 62.5 microns [µm]) (e.g., silts and clays) having a greater capacity to bind organic contaminants for transport. Increased concentrations of contaminants in sediment similarly increase the likelihood of binding, mobilization, and transport.

The sediments within the P-151 fuel pier project footprint and the NMAWC project footprint can be characterized as fine grain sand for both sites, with more than 60 percent of the size classes greater than 62.5 µm. As previously mentioned, larger particles sizes (greater than 62.5 µm) indicates a reduced potential for binding to contaminants. Further, under similar hydrographic conditions, larger grained particles mobilized generally fall out of suspension earlier, thereby limiting the spatial re-distribution of suspended material.

Results of the chemical analyses of sediments collected from the project areas were compared to NOAA effects range-low (ERL) and effects range-median (ERM) values. For the purposes of this EA, the NOAA effects-range values represent an established method for assessing the potential significance of elevated contaminants of concern, and therefore the potential to have adverse toxicological effects (NAVFAC Southwest 2013a). However, these NOAA guidelines should not be inferred as a compliance criterion (NAVFAC Southwest 2013a).

Analytical results from the composite of NMAWC sediments sample locations were below the corresponding ERL for all chemicals tested, including PAHs Metals, polychlorinated biphenyl (PCB) Aroclors, Organotins, Pesticides, and Petroleum Hydrocarbons (C6-C44). At the proposed NMAWC project footprint, only total PCB congeners (29 micrograms per kilogram [µg/kg]) was greater than ERL screening concentration (22.7 µg/kg), and significantly less than the established ERM of 180 µg/kg.

Analytical results from the composite of three samples from the fuel pier project footprint indicate that mercury, zinc, and total PAHs were above the ERL screening level. The concentration of Mercury was 0.429 µg/kg, above than the ERL of 0.15 µg/kg but well below the mercury ERM screening value of 0.71 µg/kg. The concentration of Zinc in the fuel pier area sample was 180 mg/kg compared to the ERL screening level of 150 mg/kg. Zinc is often found in sediments near areas of heavy vessel use, and the level detected in the fuel pier sediment sample is well below the ERM value of 410 mg/kg.

The concentration of total PAHs in the fuel pier project area composite sample was above the ERL screening level (4022 µg/kg) at 7500 µg/kg, but significantly less than the ERM of 44,792 µg/kg. PAHs are hydrophobic (partition poorly into water) and have the capacity to bioaccumulate in the fatty tissues in marine organisms. Ubiquitous near urban centers, elevated PAHs in and of themselves do not indicate a potential for impact. Many individual congeners and PCB aroclors were reported in the composite sediment sample from the fuel pier area at concentrations below the level of analytical detection, i.e., not detected. Similarly, while sediment in the fuel pier area may have concentrations of total PCBs above the ERL, the presence of these chemicals alone does not imply potential impairment, given that the majority of individual PCB congeners and aroclors were at or below analytical detection.

Two lines of evidence suggest that impacts to marine water quality and adjacent marine habitats during disturbance activities from the removal of the existing fuel pier, construction of the new fuel pier, and in-water construction to support the temporary relocation of the Navy MMP would not be significant. The physical and chemical composition of the sediment from the fuel pier and proposed NMAWC project footprint disturbance areas indicates larger grain size and low concentrations of contaminants. With the exception of slightly elevated Total PAHs, Mercury, and Zinc at the fuel pier site, and elevated Total PCBs at the NMAWC footprint, chemical concentrations were below ERL screening criteria and in many cases below the analytical limit of detection for organic and inorganic contaminants of concern. The results of the sediment study indicate that contaminant resuspension during project activities would have minimal effect on fish and EFH. Therefore, impacts would not be significant.

Pier Construction

Construction of the new fuel pier would require installation of approximately 554 new pier pilings using jetting, a vibratory hammer, and a pile driver with a diesel hammer. Pre-cast concrete and cast-in-place concrete deck slabs would be assembled and multiple pipelines and their fittings would be installed, as well as utilities. Increased turbidity due to pile installation would be localized to the fuel pier area and would return to background conditions within an hour after the pile removal or installation activity ends (AMEC 2008). The potential for construction-related materials and hazardous materials to enter San Diego Bay would be minimized through the use of catch devices and sheeting as described above, and the NBPL Emergency Response Action Plan. Therefore, impacts from pier construction would be not significant.

Turning Basin

Potential sources of impacts to marine water quality associated with dredging activities would include potential release of vessel and equipment fuels and hydraulic fluids, and increased turbidity as bottom sediments become resuspended in the water column during the dredging process.

A barge-mounted clamshell bucket dredge (or a hopper [hydraulic] dredge if available) would be used during dredging activities (MNB 2012a, 2012b). Dredging projects using any type of excavating equipment (clamshell, hopper dredge, or pipeline) generate short term turbidity. This type of dredging is common within San Diego Bay. For example, a hopper dredge project with equivalent characteristics occurred in November through December 2012 (see Section 4.1.1.6) in the entrance to the federal navigation channel, near the proposed fuel pier project dredge footprint.

Typical industry practices in dredging can be used to reduce turbidity, ranging from the type of clamshell dredge bucket used (open or closed), removing material by scooping it horizontally or vertically relative to the seabed, the speed of the bucket's ascent, and the amount of dredge material in each load. If there is a need for special measures, any of these variables can be modified. If there are no restrictions, the typical bucket for new (hard bottom) dredging would be a heavier bucket that takes vertical scoops out of the bottom and would be as full as the dredge operator could make it, which depends in part on the amount of cut.

Closed clamshell buckets (also known as environmental buckets) minimize impacts to water quality by preventing water and sediment from leaking out of the bottom of the bucket as it is raised to the surface; water can only escape through the top of the bucket. Normal clamshell buckets with teeth are usually needed for new (hard bottom) dredging; the closed buckets, however, have no teeth and are not effective for hard bottom dredging. Environmental buckets work best in maintenance dredging projects to dredge soft material. The proposed dredge footprint has not been previously dredged, so hard bottom conditions are likely to be encountered there.

Increased turbidity would cause impacts to water quality that would include temporary decreases in light penetration and levels of dissolved oxygen. Analysis of core samples taken from the proposed dredge footprint in the turning basin in November 2010 indicated that the dredge sediments are composed of approximately 14 percent fine-grained material (i.e., silt and clay) and 86 percent coarser material (sand), and low or no concentrations of contaminants detected for the suite of analyses tested (*Sampling and Analysis Report for Naval Base Point Loma Fuel Pier Replacement and Dredging* [Navy Military Construction Project P-151] in Appendix D). Sands tend to settle out quickly, and contaminants do not typically adhere to larger-grained material such as sand, so contaminants would not be anticipated in the dredged material (USACE 2008, 2009). The vast majority of sediments resuspended by dredging settle out of the water column near the dredge within one hour, and only a small fraction takes longer to resettle (USACE 2008).

Increases in turbidity would be minimal due to the physical characteristics (mainly sand) of the dredge sediments, and limited to the immediate vicinity of the operation. Decreases in levels of light penetration and dissolved oxygen would occur only within a few hundred feet of the dredging site, and end several hours from the cessation of dredging activities, making a permanent decline in aquatic primary productivity unlikely. Because the material to be dredged is mostly sand in which analytical testing did not indicate elevated levels of contaminants, it is unlikely that temporary turbidity associated with dredging would mobilize significant levels of dissolved-phase contaminants into the water column. Impacts to water quality due to increased turbidity, therefore, would not be significant.

As stated in Section 2.2.1.2 under Alternative 1, dredging could take place before, during, or shortly after pier demolition and construction. It is possible that some of the pile removal/installation activities could happen at the same time as dredging, although all dredging would occur outside the least tern breeding season (1 April through 15 September). At its closest point, the dredge footprint is about 1,200 ft from the existing fuel pier and 700 ft from the new fuel pier. The dredging schedule and plan would be designed to keep the dredge work as far as possible from the pier work to avoid concentrating the effects of increased turbidity in one area.

A Section 401 Water Quality Certification from the RWQCB would be obtained, as would a Section 404/Section 10 permit from the USACE; these permits would apply to all in-water components of the project (NAVFAC Southwest 2011).

Silver Strand Training Complex Sediment Beneficial Reuse Site

The SSTC sediment receiver site is illustrated on Figure 2-10. Sediment disposal impacts may include temporary increases in turbidity and TSS levels, as well as associated decreases in dissolved oxygen in the immediate vicinity of the disposal operation (USACE 2012). The proposed project's dredged sediments would constitute a small fraction of the amounts to be deposited by other previously approved users (USACE 2012), and would be similar to the existing nearshore sands at the site (see Table 2-10 in Section 2.2.1.5). Turbidity associated with disposal would be brief because the sediments consist mainly of sand, would rapidly settle and the relatively small percentage of fines (silt and clay) would be rapidly dispersed by waves and currents. Increases in turbidity would be minimal and restricted to the immediate vicinity of the disposal operation.

Sediment samples from the proposed dredge footprint were collected in November 2010 and tested in accordance with regulations contained in Title 40 CFR Parts 220-228. The sediment characterization report is included as Appendix D of this EA. The sediment characterization report was provided to USEPA and USACE for review and comment on potential sediment disposal options. Based upon the analytical results, the agencies determined that the sediments from the proposed dredge footprint are suitable for unconfined aquatic disposal for nearshore replenishment (refer to Appendix A) (USEPA 2011). As such, the dredged sediments would not present a risk of toxicity or bioaccumulation to marine organisms. Because increased turbidity would be minimal, and the dredge material would not present a risk of toxicity to the marine environment, impacts to marine water quality would not be significant. In addition, the detailed protocol used in the previous USACE channel dredge project would be followed to ensure that dredge disposal operations from the Proposed Action do not interfere with training operations at SSTC.

Temporary Relocation of the Navy MMP

The in-water construction activities associated with temporary relocation of the marine mammals would be the same as those for the replacement fuel pier; therefore, the potential temporary impacts would be the same, i.e., a short-term increase in turbidity, potential for dust and debris to fall into the Bay, potential releases of construction and vessel-related fuel and hazardous materials. However, the construction and demolition period associated with temporary relocation of the marine mammals is much shorter than that of the replacement fuel pier: approximately 90 days. The demolition period is similarly brief: 90 days to remove/rebuild the enclosures and transfer the animals to their current location; one week to remove the guide piles. Thus, the duration of the temporary impacts would be considerably shorter for this component of Alternative 1 than for the pier replacement effort. The potential for construction and demolition related materials and hazardous materials to enter San Diego Bay would be minimized through use of catch devices and sheeting as described above, and the NBPL Emergency Response Action Plan. Therefore, impacts from construction and demolition associated with temporary relocation of the Navy MMP would not be significant.

As noted above, sediment samples at the proposed NMAWC temporary Navy marine mammal relocation site were collected and analyzed in January 2013. The analytical results did not indicate elevated levels of contaminants, so it is unlikely that temporary turbidity associated with demolition/pile removal would mobilize significant levels of dissolved-phase contaminants into the water column. Impacts to water quality due to increased turbidity, therefore, would not be significant.

The San Diego Bay shoreline at Harbor Island (west basin), listed as an impaired water body on the CWA Section 303(d) list due to copper from an unknown source is about 600 ft east of the proposed temporary Navy MMP relocation site at NMAWC (SWRCB 2012). No additional input of pollutants at the Harbor Island shoreline is anticipated due to construction of the temporary MMP facilities. Navy MMP equipment and activities at NMAWC would not involve the use of copper-containing materials (SSC Pacific 2012a). Because the construction and operation of the temporary Navy marine mammal relocation facilities at NMAWC would not result in an increase in copper concentration in San Diego Bay waters, no significant impact to water quality relative to levels of copper at Harbor Island shoreline west basin would occur.

Water and Sediment Quality Investigation

During the MILCON P-151 draft EA comment period, public commenters raised concerns regarding sediment quality and regarding hydrodynamics at the proposed temporary Navy MMP relocation area at NMAWC (RA). In response, the Navy further studied these issues. A Water and Sediment Quality Investigation was conducted in support of the temporary relocation of the MMP to NMAWC. The findings and analytical results of this investigation are presented in *Final Report Naval Base Point Loma Fuel Pier and SSC Marine Mammal Relocation Area Water and Sediment Quality Investigation San Diego Bay, San Diego, California Prepared for Naval Facilities Engineering Command Southwest by Tierra Data, Inc., April 2013* (NAVFAC Southwest 2013b). This report is included in this EA as Appendix I.

To evaluate potential bacterial impacts to water quality associated with the temporary relocation of the Navy MMP to NMAWC, available water quality data was reviewed, additional field surveys were performed, and hydrodynamic modeling was conducted. The findings of the investigation concluded that once the marine mammals are moved to the proposed RA site indicator bacteria, fecal and total coliform, concentration values contributed by the marine mammals are not expected to result in increased frequency of exceedances of regulatory water quality objectives for indicator bacteria in waters designated for contact recreation (REC-1) beneficial uses. The frequency of exceedances is expected to primarily be dependent on external sources related to stormwater runoff and not the marine mammal inputs. In addition, the relocation of the marine mammals is not anticipated to increase the likelihood of algal blooms or adverse nutrient loading conditions.

Existing water quality data were reviewed and compared to the REC-1 fecal and total coliform bacteria water quality objectives provided in the San Diego RWQCB, San Diego Region Basin Plan (herein Basin Plan). The Basin Plan objectives for fecal coliform are: 1) shall not exceed 200 most probable number (MPN) per 100 ml for any 30 day logarithmic average (at least 5 samples), and 2) shall not exceed 400 MPN per 100 ml for more than 10 percent of samples during any 30 day period. The Basin Plan objectives for total coliform are: 1) no more than 20 percent samples at any sampling station, in a 30 day period, may exceed 1,000 organisms per 100 ml, and 2) no single sample, when verified by a repeat sample taken within 48 hours, shall exceed 10,000 organisms per 100 ml. Indicator bacteria data sets were obtained from the City of San Diego for outfalls discharging to the Naval Training Center (NTC) Channel and from the County of San Diego Environmental Health Department (SDCDEH) for receiving water data during dry season months near Spanish Landing. Data from the City (2008 to 2012) displayed elevated fecal and total coliform levels, whereas data from SDCDEH (2009 to 2012) rarely exceeded the REC-1 objectives, only one fecal and one total coliform sample during the period, and the logarithmic averages for fecal coliform were all below the 200 MPN/100ml objective. The City of San Diego data do not represent existing receiving water conditions, but rather provide information on a potential source of bacteria loading, urban runoff. SDCDEH data represent the existing receiving water conditions at Spanish Landing during dry season months.

In addition to the City of San Diego and SDCDEH data, bacteria sampling data from the Navy's MMP for the SSC Pacific marine mammals' existing location and the proposed temporary RA was reviewed. Water samples were collected monthly from January 2010 through November 2012 adjacent to the mammals' existing enclosures and the proposed NMAWC RA. With a few exceptions bacterial levels in the samples were below the San Diego Bay REC-1 water quality objectives for fecal coliform. The exceptions included four exceedances of the 400 MPN/100 ml objective at the proposed RA in 2010. However, there have been no exceedances at the RA since November 2010 (a period longer than 2 years) and no exceedances of the fecal coliform objectives have been recorded at the location of the existing enclosures. The monthly historical sampling data were also compared to the total coliform REC-1 water quality objectives for the existing enclosures and RA. With one exception in December 2010, all sample results were below total coliform objectives at the existing enclosures location. At the proposed temporary RA, there were seven exceedances of the total coliform objective from 2010 through 2012. Six of the seven exceedances occurred during the wet season and were likely associated with stormwater runoff.

In January 2013, receiving water samples were collected at the existing enclosures and at the proposed RA to establish existing water quality conditions and to evaluate the effects of dispersion and natural degradation of the bacteria from factors such as sunlight, salinity, and water temperature. Twelve water samples were collected in January 2013 100 ft away from the existing marine mammal enclosure locations, six during flood tide conditions and six during ebb tide conditions. The 100 ft distance represents the 100 ft security zone that is in place at the existing enclosures and would be established for the proposed temporary RA, thus, only San Diego Bay water outside the 100-ft zone would be accessible to the public for recreation. All sample results were below laboratory detection limits for both fecal and total coliform (less than 18 MPN/100 ml). These results indicate that with the effects of dispersion and natural degradation at the existing enclosure locations maintained bacteria levels below REC-1 water quality objectives. Natural degradation can substantially lower bacteria concentrations in the bay water and must be considered when evaluating impacts to water quality. Six water samples were also collected in January 2013 in the approximate locations where the SSC Pacific marine mammal enclosures would be placed at the proposed RA. The RA samples were collected during the same flood and ebb tide conditions on the same dates as the samples collected from the existing enclosures. A fecal coliform concentration of 68 MPN/100 ml and a total coliform concentration of 140 MPN/100 ml were detected in one of the proposed RA location ebb tide samples. Total and fecal coliform bacteria concentrations were reported as below laboratory detection limits (less than 18 MPN/100 ml) for all the other RA samples.

Hydrodynamic modeling of the existing SSC Pacific marine mammal enclosures and the proposed temporary RA was conducted using a Curvilinear Hydrodynamics in three dimensions (CH3D) model that was developed for San Diego Bay. The CH3D model results were used to identify comparative tidal flushing values between the existing enclosures and proposed RA, and to provide average fecal coliform and nutrient concentrations throughout the RA site based on projected loading from the proposed number of marine mammals (70 dolphins and 30 sea lions) that will be relocated. Model results indicate that although tidal flushing values averaged 3.38 times higher at the existing enclosure locations compared to the proposed RA, the indicator bacteria concentrations contributed by the marine mammals will not significantly increase exceedances of water quality objectives for indicator bacteria in REC-1 beneficial uses. Modeling was performed based on expected fecal coliform loading from dolphins and sea lions without accounting for natural bacteria degradation factors such as ultraviolet radiation from sunlight, salinity, and water temperature. Using the loading data from the Swimmer Interdiction Security System (SISS) Final EIS Naval Base Kitsap-Bangor (Navy 2009), the modeling results are based on the mean of the four modeled cells within the RA and are a best estimate of fecal coliform concentrations contributed by the marine mammals. Based on the hydrodynamic modeling, the relocation of the marine mammals to the RA would contribute on average 90 MPN/100 ml of fecal coliform to the existing conditions. Considering natural degradation factors were excluded from the modeling the predictions are likely a high estimate. To evaluate the accuracy of the model the model was run concurrently for the existing enclosures site. The modeling results predicted an average concentration of 5 MPN/100 ml at the existing enclosures, which compares favorably to concentrations recorded during the January 2013 sampling events.

Nutrient source loading examined by the hydrodynamic modeling using individual marine mammal species contributions and proposed animal relocation numbers reported that concentrations of both nitrogen and phosphorus would not cause exceedances to regulatory standards. Constraints on the results from physical and biological processes not accounted for during the modeling effort (plant uptake and nutrient recycling) place the reported values in the conservative context and are not anticipated to increase the likelihood of algal blooms or adverse nutrient loading conditions.

In summary, review of the existing available data for indicator bacteria indicate temporal variability of the fecal and total coliform concentrations at the existing enclosures and the RA. The results place into context the relatively low frequency in which REC-1 standards were exceeded at the RA location over a 34-month period. City of San Diego outfall data and the higher frequency of exceedances recorded during wet season months suggests that potential bacteria sources from storm events intermittently contribute to overall bacteria loading and may elevate the likelihood of exceedances. In addition, dry season data from the SDCDEH covering 2009 through 2012 only had one instance when REC-1 standards for indicator bacteria were exceeded further suggesting that stormwater runoff may be a primary driver for exceedances recorded at the RA.

Sampling conducted 100 ft from the existing enclosures for fecal and total coliform indicate that dispersion and natural degradation are significant factors in lowering bacteria concentrations and can be expected to reduce concentrations at the RA. These results compared favorably to predicted values from the hydrodynamic modeling that was used to predict average concentrations at the RA resulting from marine mammal contributions. The predicted average value (90 MPN/100ml) provides a relevant value to estimate fecal coliform concentrations at the RA. Based on a cumulative sum of the fecal coliform load contributed by the proposed marine mammal relocation and fecal coliform concentration existing conditions at the RA from the MMP data, no additional exceedances of the REC-1 standards would have occurred over the nearly 3 years of measures at the RA site between 2009 and 2012. Though the hydrodynamic modeling did not specifically address predicted total coliform concentration levels it is appropriate to assume the fecal coliform concentration estimates are an accurate surrogate for total coliform concentrations based on specific marine mammals as the source.

In summary, relocation of the Navy marine mammals to the proposed RA is not expected to result in additional exceedances of REC-1 standards for indicator bacteria, fecal and total coliform, and is not anticipated to increase the likelihood of algal blooms or adverse nutrient loading conditions. These conclusions are based on the conservative hydrodynamic modeling that does not consider natural degradation of the bacteria and physical and biological processes that would be expected to lower nutrient concentrations. For the bacteria concentrations natural degradation, along with dispersion, likely were significant factors in the non-detect values measured 100 ft from the existing enclosures. Similar affects can be expected at the 100 foot security zone that would be implemented at the RA. For this reason using the predicted values from the hydrodynamic model is conservative and further reinforces the conclusion that additional exceedances of the REC-1 standards are not expected. Therefore, based on this combined modeling and sampling data, and taking into account historical conditions, it is not anticipated that moving the marine mammals to the proposed RA will have significant water quality impacts at the 100 foot security barrier or beyond.

In the interest of validating the results of the Navy's investigation, monitoring would be conducted while the mammals are at the RA, and results would be submitted to the CCC Staff. If monitoring results indicate that water quality is impacted by this action more than currently anticipated, the Navy will employ adaptive management measures in consultation with CCC staff. Potential adaptive management measures include:

- 27 of the 30 sea lions would be housed in the enclosures furthest to the south, which receives higher tidal flushing, increasing natural degradation.
- Solid portions of sea lion scat would be scooped up and disposed of as solid waste prior to high pressure washing of the enclosures.
- Moving some of the mammals back to the existing enclosure locations during non-pile driving operations.
- Install ultraviolet treatment systems for the enclosure area to reduce bacteria loading.
- Install flushing system (diffusers/air bubblers) to increase tidal flushing/aeration action.
- Install Oloid ® floating aerators for mixing and increasing natural degradation.

Proposed Temporary Relocation of Everingham Brothers Bait Company Bait Barges

The bait fish are held in enclosures that have 1-in wide slots on the sides allowing sea water to flow through freely (Everingham Brothers Bait Company 2012). It is important to the health of the bait fish that they always stay in the water they live in normally (fresh sea water with the correct temperature, salinity, oxygen, etc.). Waste water from bathrooms on the barges goes into holding tanks that are pumped out once per week by a contractor (Everingham Brothers Bait Company 2012). The same practices would be followed at the temporary relocation site. As shown on Figure 2-2, both site options under consideration for temporary relocation of the bait barges are in open waters in San Diego Bay, outside the federal navigation channel. Like the fuel pier and the current bait barge location, both proposed temporary bait barge relocation option sites are located within the North Bay – Marine region, where tidal action has the greatest influence on circulation and bay water is exchanged with sea water over a period of 2 to 3 days (Port of San Diego 2007). Because the Everingham Brothers Bait Company operations are centered on maintaining the ambient water quality for the health of the bait fish, and do not involve waste water discharges, and due to natural tidal circulation through the North Bay-Marine Region, there would not be a significant impact to marine water quality associated with temporary relocation of the bait barges southeast of Harbor Island.

In summary, during demolition, construction, and dredging, protective measures would be implemented to minimize impacts to marine water quality. Protective measures for demolition and construction would include the NBPL Emergency Response Action Plan and the use of catch devices and sheeting. As a protective measure to minimize turbidity retention of the sheet pile beneath the existing fuel pier would be left in place. All in-water work would comply with the requirements of a Section 401 Water Quality Certification from the RWQCB and a Section 404/Section 10 permit from the USACE. It is not anticipated that bacteria loading from the marine mammals alone would exceed San Diego Basin Plan REC-1 water quality limits at the proposed RA 100 ft-security barrier; therefore, significant impacts to water quality would not occur. However, the REC-1 objective levels could be exceeded near NMAWC if external sources (i.e., bacteria from sources other than the Navy MMP) elevate background bacteria concentrations close enough to the threshold for the addition of the MMP concentration to exceed it. The greatest probability of additional exceedances would likely occur during the wet season and would likely be dependent on the frequency and magnitude of rainfall events and resulting stormwater input. The Everingham Brothers Bait Company bait barges would not affect bathymetry or circulation at the temporary relocation site or discharge waste water. The changes to water quality associated with demolition, construction, dredging, and temporary relocation of the Navy MMP and the Everingham Brothers Bait Company bait barges would be localized and short-term. For the reasons summarized in this paragraph and described in detail above in the preceding paragraphs, with implementation of Alternative 1 a significant impact to marine water quality would not occur. The use of dredge sediments for nearshore replenishment would help to restore natural bathymetry; therefore, this component of Alternative 1 would be a beneficial impact.

<u>Surface Water Quality</u>

The ROI for surface water quality is the fuel pier, the current location of the Navy marine mammal enclosures, and NMAWC. Potential surface water quality impacts associated with Alternative 1 include spills and releases of construction-related hazardous and non-hazardous materials, construction materials such as dry and liquid concrete, and turbidity caused by runoff carrying soil and dust from shoreside construction/staging areas.

Pier Demolition and Pier Construction

A stormwater management system would be required for the new pier (Navy 2010b). All stormwater runoff would be managed in accordance with current NBPL NPDES Permit requirements (NAVFAC Southwest 2011). The proposed new pier deck design is such that all rainfall accumulating on the lower deck as well as rainfall from the 85th percentile storm event accumulating on the upper deck of the new pier would be collected on the pier and sent to the FOR receipt tank for treatment (Burns and McDonnell 2012). The upper deck would be equipped with underflow scuppers that would permit a portion of the runoff from large storm events to discharge to the bay. The underflow design would prevent surface sheen and floating fuel from being discharged to the bay and also capture the "first flush" of runoff from a storm to be sent to the FOR Receipt Tank. All runoff from the fuel containment areas and the lower deck would be piped to the FOR system for processing (Burns and McDonnell 2012).

Upon completion of the new fuel pier, the NBPL Storm Water Discharge Management Plan and the fuel pier BMPs would be reviewed, and revised/updated as needed to incorporate changes resulting from the changes to the fuel pier structure and/or operations. The NBPL Storm Water Discharge Management Plan and Basewide BMPs for preventing and minimizing contact of potential pollutants with stormwater would continue to be followed, including: restricting access, regular cleaning and sweeping, controlling spills and reducing waste, avoiding hosing down the site, and regular inspection and maintenance of the storm drain system (NAVFAC Southwest 2009b). All BMPs specific to the fuel pier would also be followed. Implementation of the BMPs and compliance with NPDES permit requirements would ensure that no significant water quality impacts would occur as a result of operations at the new fuel pier.

A 12-in diameter stormwater outfall is located immediately north of the existing pier abutment. This outfall discharges stormwater runoff from the paved area directly west of the existing pier (Burns and McDonnell 2012). The existing discharge point penetrates the vertical wall portion of the existing pier abutment and discharges on to the riprap located along the shoreline north of the existing fuel pier. The existing stormwater outfall would be removed (Burns and McDonnell 2012). A new storm sewer system consisting of four grated area inlets, 12-in reinforced concrete pipe, and a single outfall point would replace the existing system (Burns and McDonnell 2012). The existing outfall would be relocated from the north side of the existing pier to the north side of the new pier (Burns and McDonnell 2012). No changes in impervious areas contributing to the storm sewer system are anticipated. Replacement and re-routing of the existing stormwater outfall would continue to provide drainage for the paved area west of the existing pier, thus, the proposed pier replacement would not have a significant impact to the existing surface water drainage pattern in the area immediately adjacent to the pier.

Temporary Relocation of the Navy MMP

The existing NBPL NPDES permit addresses the following discharges associated with the Navy MMP in its current location: potable and seawater discharges from cleaning the mammal enclosures (the floating enclosures and the nets suspended in the water below), potable water from rinsing small boat interiors and engines, and seawater discharges from above ground shipboard pool simulators. The same permit conditions would apply to the Navy MMP at the proposed temporary relocation site at NMAWC (SSC Pacific 2012b).

In summary, standard operating procedures and BMPs would be followed to reduce impacts to surface water to a less than significant level. The new fuel pier would have stormwater management capabilities that would comply with current NPDES Permit requirements. Basewide and site-specific BMPs to prevent impacts to surface water would be followed at the new fuel pier. Therefore, implementation of Alternative 1 would not have a significant impact to surface water quality and beneficial water uses within the bay. Improved stormwater management capabilities for the fuel pier would be a beneficial impact to surface water quality.

3.6.3.3 Alternative 2 Delayed Dredging Alternative

Under Alternative 2, the same project components would be implemented as described under Alternative 1. Under this Alternative, dredging would be done years after the pier replacement effort is completed. Thus under Alternative 2, there would be no potential intermittent overlap of increased turbidity associated with demolition and construction due to dredging activities.

Under Alternative 2, during demolition, construction, and dredging, the same protective measures would be implemented to minimize impacts to marine water quality that would be used for Alternative 1: retention of the existing sheet pile, the use of catch devices and sheeting, and the NBPL Emergency Response Action Plan. All in-water work would comply with the requirements of a Section 401 Water Quality Certification from the RWQCB and a Section 404/Section 10 permit from the USACE. Changes to bacteria and nutrient levels in the bay waters near NMAWC associated with proposed temporary relocation of the Navy MMP would be the same as under Alternative 1. The Everingham Brothers Bait Company bait barges would not affect bathymetry or circulation at the selected temporary relocation site or discharge waste water. As with Alternative 1, demolition, construction, and dredging would not have significant impacts to bathymetry and circulation. Therefore, implementation of Alternative 2 would not have a significant impact to marine water quality, surface water quality, and beneficial water uses within the bay. As with Alternative 1, improved stormwater management capabilities for the proposed new fuel pier, and the reuse of dredge sediments for nearshore replenishment are anticipated to be beneficial impacts.

3.6.3.4 Mitigation Measures

Implementation of Alternative 1 or Alternative 2 would not result in significant impacts to water resources; therefore, no mitigation measures are proposed.

3.6.3.5 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, temporary relocation of the Everingham Brothers Bait Company bait barges, demolition and replacement of the existing fuel pier, dredging of the turning basin and beneficial re-use of dredge sediments for nearshore replenishment would not occur. No changes to existing water resources would occur. Therefore, implementation of the No-Action Alternative would not have a significant impact to water resources.

3.7 HAZARDOUS MATERIALS AND WASTES

3.7.1 Definition of Resource

The terms *"hazardous materials"* and *"hazardous waste"* are defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA [42 19 USC § 6901 *et seq.*]). In general, hazardous materials include substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health or the environment when released into the environment. Hazardous wastes are regulated under RCRA and defined as any solid, liquid, contained gaseous, or semisolid waste, or any combination of wastes that either exhibit one or more of the hazardous characteristics of ignitability, corrosivity, toxicity, or reactivity, or are listed as a hazardous waste under 40 CFR Part 261. Petroleum products include petroleum-based fuels, oils, and their wastes.

Hazardous waste issues may also include the presence of asbestos and lead-based paint (LBP) in structures and exposure to contaminated sites. Asbestos was once widely used in building construction as a fire retardant and noise barrier, but was linked to several diseases. Since the 1970s its use has been restricted by federal regulation under the Clean Air Act (CAA) (e.g., Asbestos National Emission Standards for Hazardous Air Pollutants) rules, and the Toxic Substances Control Act (e.g., Asbestos Ban and Phaseout) asbestos rules. Friable (brittle) asbestos becomes hazardous when fibers become airborne and are inhaled. Lead, which was used as an additive and pigment in paints for many years before 1978, has been associated with central nervous system disorders, particularly among children and other sensitive populations. Exposure to lead is usually through inhalation during renovation and demolition activities or through ingestion of paint chips or lead-contaminated drinking water. Contaminated sites are locations that have been rendered unsafe due to the presence of hazardous wastes. To facilitate the investigation and cleanup of contaminated sites at military installations, the DoD has developed the Installation Restoration (IR) Program. The IR Program is the process by which contaminated sites and facilities are identified and characterized, and existing contamination is contained, removed, and disposed of to allow for the future beneficial use of the property.

Hazardous materials and wastes are also controlled under the California Code of Regulations (CCR) and these regulations are implemented by the California Department of Toxic Substances Control and the local Certified Unified Program Agency. San Diego County, Department of Environmental Health (DEH) acts as the Certified Unified Program Agent under authorization from the California Environmental Protection Agency to implement state environmental requirements. The U.S. Navy is required to comply with these acts and all DoD requirements, as well as management plans specific to NBPL.

Emergency Planning Community Right-to-Know Act (EPCRA)

The EPCRA (42 USC § 11001 *et seq.*) includes four major provisions:

1) Emergency planning (Section 301-303)
2) Emergency release notification (Section 304)
3) Hazardous chemical storage reporting requirements (Sections 311-312)
4) Toxic chemical release inventory (Section 313)

Section 311 requires facilities that have Material Safety Data Sheets (MSDS) for chemicals held above certain quantities to submit either copies of their MSDS or a list of MSDS chemicals to the Local Emergency Planning Committee and local fire department. Facilities that need to report under EPCRA Section 311 must also submit an annual inventory report (Tier I or Tier II form) for the same chemicals. This inventory report must be submitted to the State Emergency Response Commission and local fire department by 1 March each year. The information submitted under Sections 311 and 312 are available to the public from Local Emergency Planning Committees and State Emergency Response Commissions. In California, the chemical storage reporting thresholds under the California Health and Safety Code Chapter 6.95 are 55 gallons, 500 pounds, and 200 cubic ft of a compressed gas. Otherwise, the federal threshold limits are 500 pounds for extremely hazardous substances and 10,000 pounds for all other hazardous substances. Any hazardous materials and wastes generated during construction and operation would be subject to installation-wide EPCRA reporting.

3.7.2 Affected Environment

The ROI of potential effects associated with hazardous materials and hazardous wastes for the Proposed Action is NBPL and San Diego Bay. This section describes the presence of hazardous materials and wastes within the proposed project locations.

3.7.2.1 MWR Marina at NMAWC (Site Proposed for Temporary Navy MMP Relocation)

Small volumes of lubricating oil, gasoline, and various marina boat maintenance materials are currently stored and used at the MWR marina piers at NMAWC. Hazardous wastes at the marinas comprise small volumes of oily rags and marina boat maintenance wastes (NAVFAC Southwest 2011a). These wastes are properly managed in accordance with the Waste Management Plan (WMP) for the San Diego Metro Area (an environmental reference document to support overall hazardous waste management by NRSW military and civilian personnel that also establishes an effective management program for hazardous waste compliance according to federal, state, and local regulations [NRSW 2007]) and disposed of via a licensed contractor.

3.7.2.2 Everingham Brothers Bait Company Bait Barges

The bait barges have a total of three diesel storage tanks: one 1,500-gallon tank and two 240 gallon (Everingham Brothers Bait Company 2012). The storage tanks contain fuel for a generator that powers pumps, lights, and other equipment. The barges have rooms that are specially built as containment structures for the tanks and are capable of capturing the tank contents in the event of a leak. The Everingham Brothers' own vessels refill the barge fuel tanks (Everingham Brothers Bait Company 2012). The connections for the fuel transfer hose are inside the delivering vessel and the bait barges' storage tank rooms, to prevent spills during refueling. Personnel from Navy Environmental inspect the barges from time to time. The company is working to reduce the hours of generator operation on the barges by using light-emitting diode lights, a rechargeable diesel-powered battery, and planned installation of a vertical access wind turbine with a power storage battery (Everingham Brothers Bait Company 2012).

Hazardous materials such as fresh oil, waste oil, and paint on the bait barges are handled and stored according to the Navy's requirements, applicable state, and county regulations (Everingham Brothers Bait Company 2012). Evergreen Environmental Services (Evergreen Oil, Inc.) removes hazardous waste from the barges (Everingham Brothers Bait Company 2012). All the company's barges and vessels have onboard and follow a policy book for hazardous materials training that was developed by a hazardous materials consultant according to applicable state and county regulations (Everingham Brothers Bait Company 2012). All

Everingham Brothers barge and boat personnel are trained according to this policy book. All the barges and skiffs have spill kits on board (Everingham Brothers Bait Company 2012).

Although the majority of the paints and other materials used for repairing the bait receivers are kept on the repair vessel, the barges have a dedicated paint locker room designed and constructed for containment purposes. Wastes from the maintenance operations are properly stored on the barges until they are removed by Evergreen Environmental Services for proper disposal.

3.7.2.3 Proposed Temporary Bait Barge Relocation Sites Options 4A and 6A

As shown on Figure 2-2, both proposed temporary relocation Options (4A and 6A) for the bait barges are in open waters in San Diego Bay, outside the federal navigation channel where no vessels are currently anchored. Aside from fuel in vessels that pass through these two areas, there are no hazardous materials, hazardous wastes, or petroleum products at either of proposed temporary relocation sites.

3.7.2.4 NBPL Fuel Pier Bulk Fuel Pipelines

The pipelines on the existing fuel pier contain a total static volume of approximately 26,040 gallons of fluids comprising fuels, lubricating oil, and contaminated petroleum product (CPP, a mixture of fuel and water) (MNB 2010). The bulk fuel pipelines and fuel transfer operations at the existing fuel pier are regulated by multiple federal and state agencies. Some of these include the following (agency name is in bold, legislative title is in italics):

- **USEPA:** 40 CFR Part 112, *Oil Pollution Prevention and Response; Non-Transportation-Related Facilities*
- **USEPA**: 40 CFR Part 300, *The National Oil and Hazardous Substances Pollution Contingency Plan,* (National Contingency Plan)
- **USEPA**: 40 CFR Part 302, *CERCLA*
- **USEPA**: 40 CFR Part 355, *EPCRA*
- **USEPA**:, 40 CFR Part 264, Subpart D, *RCRA*
- **USEPA**: 40 CFR Part 68, *Chemical Accident Prevention Provisions*
- **USEPA:** Public Law 101-380 (33 USC 2701 et seq.;104 Stat. 484) Oil Pollution Act
- **Occupational Safety and Health Administration**, 29 CFR 1910.38(a), *Employee Emergency Plans and Fire Prevention Plans*, 1910.120, *Hazardous Waste Operations and Emergency Response,* and 1910.165, *Employee Alarm*
- **The Pipeline and Hazardous Material Safety Administration (U.S. Department of Transportation [USDOT]):** Direct Final Rule as Amended, 49 CFR Part 194, *Response Plans for On Shore Oil Pipelines*
- **The Pipeline and Hazardous Material Safety Administration (USDOT):** 49 CFR, Part 195 Transportation of Hazardous Liquids by Pipeline
- **State of California, Office of Oil Spill Prevention and Response** Title 14 CCR Sections 815-820, *Oil Spill Contingency Plans*

- **USCG:** 33 CFR Part 154, *Facilities Transferring Oil or Hazardous Material in Bulk*
- **CSLC** CCR: Title 2, Division 3, Chapter 1 *Marine Terminal Oil Pipelines*
- **CSLC** CCR: Title 24, Part 2, Vol.1, *Chapter 31F MOTEMS*

The fuel pier pipelines were constructed and are maintained in compliance with the applicable federal and state regulations, which specify measures for preventing and containing leaks and spills. Secondary containment structures have been installed where required or appropriate on the fuel pier (NAVFAC 2009). In addition to the 8-in curbing around the pier deck, concrete curbing is installed around the valves and risers and at the loading stations. Spill kits and absorbent materials are located on the pier for response to a spill (NAVFAC 2009). Pipelines, manifolds, valves, loading arms, hoses, containment pits, and other safety equipment such as fire protection or control equipment, lighting, emergency shutdown switches, and the communication systems are inspected weekly and before and after any vessel transfer operation (NAVFAC 2009). The fuel loading arms and supporting piping systems are routinely inspected along with other equipment on the fuel pier (NAVFAC 2009). The pipelines are pressure-tested in accordance with CSLC requirements (Shaw Environmental, Inc. 2007).

The safety and health of all fuel pier personnel, customers, and protection of the environment are of primary importance to the Navy Regional Fuel Officer and Fuel Director. NBPL DFSP has a safety and health program that conforms to the best practices in industry. The program embodies fostering proper attitudes within the workforce and is focused on safety practices, accident prevention, and insuring that mechanical and physical equipment required for personal safety and health are maintained to the highest possible standards. NBPL DFSP subscribes to and emphasizes risk management as the cornerstone of its safety program (Navy 2012a). As such NBPL DFSP utilizes a documented process by which the steps/procedures required to accomplish a work activity are outlined; the actual or potential hazards of each step are identified and measured; and its workforce are charged with eliminating or controlling those hazards (Navy 2012a).

Regarding fuel pier operations, standard operating procedures for Barge Operations, for Lube Oil Operations, for Pipeline Operations, for Ship Operations, for Small Craft Operations, and for Truck Loading Operations are in place and periodically updated (Navy 2012a). NBPL DFSP's preventative maintenance work plans also include safety plans that discuss the principal steps, potential safety and health hazards, and recommended controls. In the event of an accident or spill, NBPL implements the NBPL Emergency Response Action Plan. The Fuels Department holds daily, weekly and quarterly safety stand downs using the following guiding safety principles (Navy 2012a):

- **General Safety Requirements:** Present an overview of the safety and health program, risk management, hazard analysis, hazard assessment, general safety practices, housekeeping and hygiene rules, and first aid.
- **Emergency Safety Requirements:** Outline emergency response training requirements and safe practices applicable to all emergencies. Describes the type of communications devices available and outlines practices for effective emergency communication.

- **Training:** Detail training programs are required for operating personnel working at NBPL DFSP as well as guidelines for maintaining public awareness regarding the facility.

Operations at the fuel pier meet all USCG requirements in 33 CFR Part 154 (NAVFAC 2009). Fuel transfer equipment meets or exceeds industry and regulatory standards (NAVFAC 2009). Loading arms and transfer hoses are marked and pressure tested as required. The communications equipment is maintained on the pier and between persons-in-charge by two-way radios during any fuel transfer operation (NAVFAC 2009). Fire suppression equipment (extinguishers, hydrants, monitors) and personnel safety equipment (first-aid kit, emergency eye wash/shower, life ring, etc.) is available on the pier. Control systems and alarms are located at each loading station (NAVFAC 2009). The piping is controlled with an automated fuel handling supervisory control and data acquisition system that provides alarms as well as graphically depicts pressures, flows, and quantities to and from the tanks. During each fueling evolution on the fuel pier, a safety supervisor and an observer known as a "hose watch" monitor product flow and can manually shut down the systems in an emergency (NAVFAC Southwest 2010a).

The CSLC provides regulatory oversight for the fueling operations and is notified of each fueling evolution for a ship capable of storing 90,000 gallons or more fuel (Navy 2010a). Inspectors from CSLC are present at fueling evolutions on the fuel pier 50 times per year on average (Navy 2010a). U.S. Customs inspections occur on average 2-4 times per year.

The volume of CPP off-loaded can vary from around 50,000 gallons to 150,000 gallons depending on the vessel (Navy 2010a). The USCG conducts inspections to insure that NBPL DFSP is in compliance with its USCG Certificate of Adequacy to receive CPP from ships, which documents the type of waste the facility may receive, the waste transfer rate, and the storage capacity of the facility. CPP is pumped from vessels berthed at the fuel pier into a 4,000 gallon aboveground storage tank onshore and then to the NBPL DFSP FOR system where petroleum products are separated from the water (Navy 2011). Oil recovered at the FOR system is recycled via a hazardous waste contractor, and water is discharged to the sanitary sewer system (NAVFAC Southwest 2009).

Because DFSP Point Loma is a bulk fuel storage and transfer facility, Defense Energy Support Center, U.S. Navy policy, and government regulations require that a contingency plan is in place to respond to oil and hazardous substance spills (NAVFAC 2009). The ICP for Oil and Hazardous Substance Spill Prevention and Response NBPL serves as the single operational document used for responding to any spill occurring at NBPL (NAVFAC 2009). In the event of a spill or release of oil or hazardous material at the fuel pier, the procedures discussed in the Emergency Response Action Plan, and particularly the Red Plan sections of the ICP are followed to contain the release and properly dispose of any spilled materials in compliance with CCR Title 14 (NAVFAC 2009). The Emergency Response Action Plan and the Red Plan include specific measures such as securing pumps and closing valves, blocking drains, and deploying booms (NAVFAC 2009). Additional booms are deployed as quickly as possible to prevent the spill from moving into the bay or affecting sensitive areas (NAVFAC 2009). Additional military and civilian contractor personnel and equipment are mobilized as needed to expedite cleanup operations, and procedures are reviewed to address the cause of the spill and prevent its recurrence (NAVFAC 2009).

3.7.2.5 NBPL Fuel Pier other Hazardous Materials/Waste

Hazardous Materials

No hazardous materials other than fuel are present on the fuel pier. Routine maintenance of the metal bollards and pipe risers involves the use of limited quantities of paint that are stored shoreside in the Fleet Logistics Center (FLC) hazardous materials locker (NAVFAC Southwest 2010b). Paint is brought out to the pier for use, then returned to the locker when painting is completed (NAVFAC Southwest 2010b).

Hazardous Wastes

Hazardous wastes aboard NBPL are managed according to Chief of Naval Operations Instructions (OPNAVINST) 5090.1C *Environmental and Natural Resources Program Manual* and the WMP for the San Diego Metro Area (NRSW 2007). The guidance in the WMP ensures that Navy commands and contractors manage hazardous waste in accordance with requirements specified in federal, state and local laws and regulations including Title 40, CFR, Title 22, CCR, California Health and Safety Code, and San Diego County Code of Regulatory Ordinances. The WMP contains instructions for hazardous waste minimization, waste characterization, use of proper containers and storage practices, inspection, and disposal via a licensed hazardous waste contractor (NRSW 2007).

The Defense Reutilization and Marketing Office (DRMO) through its contractors manages, stores, ships, and disposes of hazardous materials associated with all DoD installations and operations. DRMO maintains all hazardous materials documentation. DRMO also contracts with licensed firms for proper disposal of these materials at permitted facilities.

Hazardous wastes generated at the fuel pier comprise oiled boom, rags, and absorbent materials (NAVFAC Southwest 2010a). These wastes are taken to the 90-day storage facility behind located behind Building 75 (about 400 ft northwest of the fuel pier access gate), and are properly managed in accordance with the WMP. Hazardous wastes at the fuel pier are covered under County of San Diego DEH Unified Program Facility Permit #HK 57-180134 USN-Fleet and Industrial Supply Center Point Loma Bayside (i.e., FLC Fuel Facility NBPL) and under NBPL's USEPA large quantity hazardous waste generator permit (County of San Diego 2002, NAVFAC Southwest 2010b). A facility is classified a “large quantity” generator of hazardous waste if it produces one kilogram [2.2 pounds] or more per month of acutely hazardous waste). The DEH conducts annual inspections of the fuel pier hazardous waste management operations and facilities (County of San Diego 2008, Navy 2010a).

3.7.2.6 IR Program and RCRA Facility Assessment Program Sites

The DoD established the IR Program to identify and clean up areas at military facilities that have been affected by past use of hazardous materials and disposal of hazardous waste (NRSW 2005). Cleanup of the IR Program sites is legislated through CERCLA (commonly known as

"Superfund") that primarily addresses contamination resulting from past disposal practices (NRSW 2005). Thirty-nine sites at NBPL Point Loma Complex are being investigated/cleaned up under the IR and Munitions Response Programs. Active remediation is ongoing at Fleet and Industrial Supply Center IR Site 4 near the proposed project site (about 700 ft west of the existing fuel pier shoreline abutment). Soil within Site 4 was contaminated with hydrocarbons from oily sludge cleaned from the bottoms of the tanks that was placed over the site throughout the years to minimize erosion and control dust. Onsite soil remediation with low temperature thermal desorption was completed in December 2011, and cleanup of a contaminated groundwater plume is underway (NAVFAC Southwest 2012). Cleanup has been completed and regulatory closure has been issued for 21 of the 39 NBPL IR and Munitions Response sites (NAVFAC Southwest 2012). Two closed shoreside IR sites (Sites 3 and 22) are within 500 ft of the proposed fuel pier replacement site (CH2MHill Kleinfelder 2012). Two closed shoreside IR sites (Sites 2 and 5) are within 500 ft of the proposed Navy MMP relocation facilities at NMAWC (CH2MHill Kleinfelder 2012).

Twenty-seven aboveground and underground storage tank (UST) sites have been identified at NBPL. Regulatory closure has been issued for 23 of the tank sites and cleanup activities are ongoing at four sites (CH2MHill Kleinfelder 2012). RCRA establishes requirements for current hazardous waste handling practices, as well as for investigation and cleanup of existing hazardous waste handling facilities (CH2MHill Kleinfelder 2012). Fifty-four sites were evaluated under the RCRA programs, and investigation/cleanup activities are ongoing at 12 of those sites. Regulatory closure has been issued for 42 RCRA sites (CH2MHill Kleinfelder 2012). The proposed project sites at NMAWC and the fuel pier are not identified as IR or RCRA program sites.

3.7.2.7 County of San Diego Unauthorized Release Sites and SWRCB Underground Storage Tank Sites

The County of San Diego and the SWRCB oversee investigation and cleanup of sites where releases of petroleum products and/or hazardous wastes from storage tanks have taken place. There are no such sites at the onshore areas immediately adjacent to the existing fuel pier and the location proposed for the replacement pier (County of San Diego 2011, SWRCB 2011a). There are three release sites onshore in the vicinity of the fuel pier where cleanup has been completed. Overfills resulted in the releases of CPP from two USTs shoreside on the south side of the existing fuel pier (Tanks 115A and 115B) (Navy 2012b). The release was cleaned up and there was no soil contamination (Navy 2011). The two tanks were taken out of service, filled in place with concrete slurry under SWRCB oversight in 1997 and the case is closed (Navy 2012b, RWQCB 2005, SWRCB 2011a). Cleanup is also completed, and the case is closed for SWRCB Tank Site Building 113 located approximately 75 ft south of the existing fuel pier (SWRCB 2011a). At NMAWC, cleanup is completed, and the case was closed in 2000, for a release that occurred in 1996 at Pier 619 (SRWCB 2011b).

3.7.2.8 California SWRCB Sediment Toxic Hotspots

The SWRCB has identified toxic hotspots as locations in enclosed bays, estuaries, or the ocean where pollutants have accumulated in the water or sediment to levels that: (1) may pose a hazard to aquatic life, wildlife, fisheries, or human health; (2) may impact beneficial uses; or (3) exceed SWRCB or RWQCB-adopted water quality or sediment quality objectives (SWRCB 2003). Under the Bay Protection program, all designated hotspots require corrective action, management action, or delisting (SWRCB 2008). The proposed P-151 project locations (comprising the temporary Navy marine mammal relocation site at NMAWC, the fuel pier, the dredge footprint, and bait barge relocation sites [4A and 6A]) are neither sediment cleanup sites nor an SWRCB-identified toxic hotspot (SWRCB 2008). Neither of the proposed bait barge relocation sites is identified as a CERCLA or RCRA cleanup site (SWRCB 2012).

3.7.2.9 Public Health and Safety

Explosives Safety Quantity Distances (ESQD) Arcs

ESQD arcs are calculated for all locations where explosives are handled and stored to minimize the risk of serious personal injury, loss of life, and property damage associated with the presence of military explosives (DoD 2004). The safety distance from the explosives storage area (size of the arc) depends on the quantities and types of explosives present at that location (DoD 2004). No habitable development may occur within an ESQD arc (NAVFAC 2001). The piers at NMAWC are not approved for explosives storage and handling so there are no ESQD arcs at or near the proposed Navy MMP temporary relocation site (NBSD 2012). There are no ESQD arcs associated with the existing fuel pier or for piers and facilities in the area (NAVFAC Southwest 2010c).

Discarded Military Munitions (DMM)

DMM are unfired military munitions that have been abandoned, discarded, or improperly disposed of and are still capable of functioning (e.g., items found with their cartridges). The Navy is evaluating portions of San Diego Bay under its Munitions Response Program Site 100 – San Diego Bay Primary Ship Channels (also known as UX100, Munitions San Diego Bay Channel) (NAVFAC Southwest 2010d). Four Areas of Concern surrounding the existing fuel where historical records or other evidence suggested the potential presence of DMM were investigated using a remotely-operated underwater camera, sonar, and a magnetometer. The magnetometer data showed the presence of unknown metallic items within portions of the footprint of the proposed new fuel pier (NAVFAC Southwest 2013a).

3.7.2.10 Solid Waste

The ROI for solid waste is San Diego County. In general terms, solid waste refers to garbage, refuse, sludge, and other discarded solid materials resulting from residential activities, and industrial and commercial operations, including construction and demolition (C & D) debris. The City of San Diego uses innovative engineering, waste reduction, and recycling programs to help extend the working life of the only active, City-run landfill, Miramar Landfill, which was originally scheduled to close as early as 1995 (City of San Diego 2011). Almost 910,000 tons of waste are disposed annually at the Miramar Landfill (City of San Diego 2011). At this rate, the Miramar Landfill will likely be filled to capacity and closed by 2019 (City of San Diego 2011).

To support the City of San Diego in reaching its solid waste diversion goals (i.e., 50 percent of 1990 baseline as required by the California Integrated Waste Management Act Division 30), the

U.S. Navy and U.S. Marine Corps (USMC) agreed to limit the amount of waste sent annually to Miramar Landfill from U.S. Navy and USMC installations in San Diego County to 10.8 percent of the City's annual baseline disposal figure (NRSW 2000). To that end, NRSW has established an extensive recycling program. The NRSW Sustainable Solid Waste Program diverts cans, bottles, plastics, cardboard, and C & D waste from landfilling to the maximum extent possible (Navy Compass 2010).

Solid waste generated at the NMAWC marinas consists of a small volume of domestic trash from marina staff and boat owners (NAVFAC Southwest 2011a). Non-hazardous solid waste associated with the existing fuel pier operations consists of paper and other domestic-type trash from the Control House Building 110. These materials are included with solid waste collected and recycled from NBPL as part of the NRSW Sustainable Solid Waste Program (Navy 2011).

NRSW Instruction 11350.1A (Regional C & D Debris Landfill Diversion) requires that all construction projects submit a solid waste management plan during the project planning phase that must include the types and quantities of waste expected to be generated, actions that would be taken to divert at least 54 percent (in 2012, increasing by 2 percent each year until 60 percent is reached in 2015) of the C & D waste stream from landfilling, a list of the specific waste materials that would be salvaged for resale, reuse, or recycling, and identification and justification for materials that cannot be reused/recycled. While the project is ongoing, the contractor must submit monthly solid waste reports that include the waste tonnages recycled and landfilled (NRSW 2006). The Sustainable Solid Waste program uses a database to track reuse opportunities for recycling materials resulting from construction projects, and to track solid waste diversion for every project. As of 2011, Navy construction projects in the San Diego area are required to divert a minimum of 52 percent of C & D waste from landfill disposal (NAVFAC Southwest 2011b). In the period from 2009 through 2010, 80 percent of the C & D waste resulting from NRSW construction projects was diverted from landfill disposal (NRSW 2010).

Solid waste aboard the Everingham Brothers Bait Company bait barges comprises domestic trash, and dry paint cans and wood waste from repairing the bait receivers (Everingham Brothers Bait Company 2012). All solid waste aboard the barges is contained in commercial-size dumpsters (Everingham Brothers Bait Company 2012). When the dumpsters are full, the Everingham Brothers Bait Company vessels offload the dumpsters from the barges and transport them to the company's onshore property to be taken to Miramar Landfill by a licensed solid waste hauler (Everingham Brothers Bait Company 2012).

3.7.3 Environmental Consequences

3.7.3.1 Approach to Analysis

Federal, DoD, and U.S. Navy regulations govern the storage, disposal, and transportation of hazardous materials, hazardous wastes, and non-hazardous solid wastes. These laws and specifications were established to protect human health and the environment from potential impacts. The significance of impacts associated with hazardous materials and wastes is based on the toxicity of the substance, the quantity of the substance involved, the risk of exposure, and the method of disposal. Impacts are considered significant if the storage, use, transportation, or disposal of these substances increase human health risks or environmental exposure. The ROI for hazardous materials and wastes is NBPL, the City of San Diego, and San Diego Bay.

3.7.3.2 Alternative 1 Pier Replacement and Associated Dredging

Temporary Navy MMP Relocation Site at NMAWC

Under Alternative 1, before construction begins to modify the NMAWC site for temporary use by the Navy MMP, all hazardous materials and wastes associated with marina activities would be removed and properly recycled or disposed per the WMP. Navy MMP activities at the NMAWC site would not involve the use of hazardous materials, or generate hazardous waste (NAVFAC Southwest 2011a). As stated above in Section 3.7.2.9, the piers at NMAWC are not approved for explosives storage and handling (NBSD 2012). The temporary relocation of marine mammals maintained by the Navy's EOD Mobile Unit 1 would not result in explosives handling at NMAWC.

Temporary Relocation of Everingham Brothers Bait Company Bait Barges

Under Alternative 1, the two bait barges would temporarily relocate to either proposed relocation site Options 4A or 6A (see Figure 2-2). As stated in Section 3.7.2.2, the barges have diesel storage tanks and hazardous materials/waste storage on board. Everingham Brothers' personnel are trained in proper management procedures and the fuels and hazardous materials/wastes are stored and handled according to applicable state and county regulations (Everingham Brothers Bait Company 2012). Under Alternative 1, Everingham Brothers Bait Company would continue to manage fuel, hazardous materials, and hazardous waste according to applicable state and county regulations while at the temporary relocation site (Everingham Brothers Bait Company 2012). There are no CERCLA or RCRA sites identified at the proposed temporary relocation sites. Therefore, temporary relocation of the bait barges would not have a significant impact with respect to hazardous materials or wastes at either of the proposed temporary relocation sites Option (4A or 6A).

Fuel Pier Demolition and Construction

Hazardous materials associated with proposed demolition and construction activities would include universal wastes, LBP on bollards and striping on the pier deck, coal-tar coating on the steel superstructure of the original pier segment, oily waste water from cleaning pipelines, treated wood waste, fuel and hydraulic fluid contained in heavy equipment, vehicles and vessels performing the overall demolition and construction tasks, and paints to be used on deck infrastructure and deck striping. Potential asbestos-containing material (ACM) could be revealed when demolition exposes previously hidden structural components. Any hazardous materials and wastes generated during construction would be subject to installation-wide EPCRA 312 and 313 reporting requirements.

Impacts of accidental spills from demolition and construction debris would be minimized. The Navy would require demolition and construction contractors to prepare and implement a comprehensive debris management plan to address types of debris expected, separation, and retrieval methods. Catch devices and sheeting would be used to capture and contain debris, and floating booms would be placed around the work site to confine any potential release to a minimal area. Contractors would be required to have booms and other spill containment equipment on their work vessels and work site(s) at the fuel pier, additional to the spill containment equipment that is always present at the fuel pier.

Contractors involved with construction and demolition for all components of Alternative 1 would be subject to all federal, state, and San Diego County requirements for hazardous materials and hazardous waste management, and would be required to follow the requirements of the WMP (NRSW 2007). Section 5 of the WMP includes emergency procedures to be followed upon discovery of any spill or release either in or outside the work area that meets or exceeds these criteria:

- Any spilled substance that is greater than five gallons in total volume.
- Spilled substance(s) that enters a storm drain, sewer system, or body of water (bay).
- The spill is not easily contained or controlled.
- Spills that threaten human health, safety or the environment.

The emergency procedures include:

- Notify the federal fire department, and the Installation Environmental Office and Safety Office;
- Limit access of personnel to where the spill or release occurred;
- Identify the substance released;
- If safe, prevent the spill from spreading, cover or dike any nearby floor, storm, or sewer drains (NRSW 2007).

Building Materials Falling Under the Universal Waste Rule (UWR). Building materials falling under the UWR visually identified at the fuel pier include high-intensity mercury vapor lights, mercury vapor light ballasts, and the fuel pipes. Before pier demolition, the building materials falling under the UWR would be properly characterized, containerized removed and properly recycled or disposed of by a licensed contractor, as per the requirements of the NRSW Waste Management Plan San Diego Metro Area (Hazardous Waste Guidance for Mercury-Containing Waste) (NRSW 2007).

Coal Tar. Elevated concentrations of PAHs were detected in samples of coal tar coating on portions of the original (i.e., 1908) fuel pier steel superstructure. After the steel superstructure is disassembled and taken onshore, the Navy would characterize the coating and determine proper management and disposal for the superstructure according to all applicable federal and state regulations (NRSW 2007).

LBP Removal. LBP abatement would be performed by trained, state- certified and licensed lead paint removal contractors. The licensed contractors would be required to prepare and implement a site-specific health and safety plan that complies with California Occupational Safety and Health Administration regulations for air monitoring, engineering and work practices controls of lead emissions, signage, and personal protective equipment (PPE) such as face masks, respirators, and protective clothing. During the removal of LBP, work containment would be erected to capture and filter all contaminated air during lead removal and cleanup.

All removed LBP materials/residue would be captured and properly containerized. The contractor would be required to use catch devices and sheeting in the work area to ensure that LBP paint chips, flakes, or dust would not enter San Diego Bay. All waste would be properly stored while waiting for proper disposal per federal and state requirements. After testing is completed, the waste stream would be properly characterized for disposal as hazardous waste, excluded recycled waste, or landfill waste, as per the requirements of the NRSW Waste Management Plan San Diego Metro Area (Hazardous Waste Guidance for Construction Debris Containing Lead-based Paint) (NRSW 2007). After all bulk waste has been removed from the containment, all surfaces would be wiped down with a damp rag to remove dust. No compressed air blowing would be allowed, only vacuuming and wiping would be allowed for final cleanup.

ACM Removal. Based on the analytical results of the bulk samples collected during the 2009 survey by Ninyo and Moore, ACMs are not believed to be present at the fuel pier. Because limited-destructive sampling techniques were used in the 2009 Ninyo and Moore survey, it is possible that suspect ACMs may be found during demolition of the fuel pier. In the event that suspect ACMs are encountered, samples of suspect materials would be collected for laboratory analysis, and all activities that may disturb the materials would cease until laboratory analytical results are reviewed. Any work involving the disturbance of materials containing asbestos would be performed using appropriate work practices, and be conducted by, and under the supervision of, properly trained, experienced, and certified personnel.

If determined to be present, asbestos abatement would be performed by properly trained and licensed abatement contractors. All ACM and debris would be removed using wet methods. Asbestos barrier tape would be place around the individual sites of removal. Wearing appropriate personal protective equipment, the contractor personnel would thoroughly wet the area, and then prepare for abatement by setting up containment bags along the perimeter of the ACM area. The ACM would be cut to sections of a manageable size, and the sections would be placed in double-polyethylene-lined, closed container. The San Diego County Air Pollution Control District (SDCAPCD) would be notified in writing of the planned removal of friable (brittle) ACM per regulations. If more than 260 linear feet (lf) of asbestos were found, an asbestos abatement permit would be filed with SDAPCD in coordination with the NBPL Asbestos Program Manager. The latest applicable requirements of federal, state, and local regulations governing removal and disposal of ACM would be complied with.

Treated wood waste. The demolition phase would potentially generate treated wood waste in the form of potentially creosote-treated timber pilings supporting the caissons of the approach and north segments of the pier. Navy representatives have met with Miramar Landfill environmental personnel, provided waste determinations and a policy statement specifying how NRSW will manage various types of treated woods as either non-hazardous special waste or hazardous waste (NRSW 2007). Timber pier piling have been analyzed and classified as non-hazardous and may be transported to a municipal landfill as special waste using the criteria specified in the WMP (NRSW 2007). The Navy would submit the appropriate disposal request, manifest, or other pertinent documentation for proper waste determination to the appropriate municipal landfill authority for review (NRSW 2007).

DMM. The Proposed Action includes replacing the existing fuel pier with a double-deck pier in a similar location, but slightly different project footprint. The Proposed Action also includes a dredging component to ensure safe navigation of vessels to the new fuel pier. From 1919 to 1974, the NBPL fuel pier was used for ammunitions transfer as well as fueling (Navy 2012c). While no handling of ammunition currently occurs at the fuel pier, historical loading and unloading of ammunition from ships pierside may have contributed to the potential for DMM within the fuel pier construction footprint (NAVFAC Southwest 2013b). Magnetometer scans of portions of the project footprint identified magnetic anomalies in the marine sediment (NAVFAC Southwest 2013b). It has not been determined what the magnetic anomalies are at this time, thus from a conservative safety stance, DMM should not be ruled out (NAVFAC Southwest 2013b). Many metallic objects other than DMM (such as anchor chain, ship parts, metal pipes, cables, tools, rebar, debris etc.) impart magnetic signals (NAVFAC Southwest 2013b). Further, underwater conditions interfere with the magnetic and acoustic sensors used to detect and characterize metal objects underwater or buried in sediment.

Construction of the new fuel pier requires pile driving for the installation of approximately 300 36-in to 48-in diameter steel piles needed to meet the seismic and structural requirements of the new pier plus approximately 255 – 16- and 24-in piles for the fendering system. Ground disturbing operations, including dredging, that have the potential for physical contact in areas known or suspected to contain potential discarded military munitions require development of an Explosive Safety Submission Determination Request (ESS DR) for review by the Navy's explosive safety division. An ESS DR is a document that details how explosives safety is evaluated to ensure protection of personnel and Navy assets in the event of unintentional detonation from potential discarded military munitions. The construction contractor would draft an ESS DR to support construction and pile driving for the new Fuel Pier footprint. The ESS DR document is required to be reviewed and coordinated with the Navy Project Manager and the Explosives Safety Officer before submittal to Naval Ordnance Safety and Security Activity (NOSSA) for their approval prior to the start of fieldwork. It should be noted that the approximate water depth (40 to 50 ft) where pile driving would take place would act as a safety shield from fragmentation or blast overpressure and therefore exclusion zones and engineering controls to protect the pile driving rig operators would not be necessary(NAVFAC Southwest 2013b). However, as stated previously, a vibratory hammer and/or jetting may be used to loosen existing piles before extraction with a crane (Section 2.2.1.2) and steel piles would be driven initially with a vibratory pile driver, and then finished as necessary with an impact pile drive (Section 2.2.1.3).

NBPL has consulted with NOSSA regarding the dredging component of the Proposed Action (NAVFAC Southwest 2013b) and has received their concurrence on the ESS DR submitted for pre-construction activities. Historical records and instrument survey data associate the potential presence of DMM with the fuel pier footprint, not the dredge footprint (NAVFAC Southwest 2013b). Therefore, the potential presence of DMM in the dredge footprint is considered to be low, and it was determined that an ESS is not necessary for the dredging component of the Proposed Action (NAVFAC Southwest 2013b). However, in accordance with Navy policy, the dredged sediments from the proposed project would be screened with a 12-in square grid to remove potential DMM and debris (NAVFAC Southwest 2013b). If DMM were encountered during project activities, the Navy would evacuate the area, and conduct an emergency response by NRSW EOD Mobile Unit 3 Detachment as needed. EOD Mobile Unit 3 Detachment is dispatched from the Southwest Regional Operations Center in coordination with the cognizant Explosive Safety Officer when response is required or requested (NAVFAC Southwest 2013b).

In summary, the proposed project would be required to prepare and follow a Navy-approved ESS DR that details how Navy explosives safety standards would be evaluated and employed to ensure protection of personnel and Navy assets in the event of unintentional detonation during project activities. The water depths in the project areas where pile driving and dredging would take place would absorb the shock waves and fragmentation of an accidental detonation. The dredged sediments would be screened to remove potential DMM, and NRSW EOD Mobile Unit 3 Detachment would respond if needed. With the protective effect of the pile-driving site, water depths and use of the above-referenced safety plans and procedures there would be no significant impact from DMM.

ESQD Arcs. There are no ESQD arcs associated with the NMAWC temporary Navy marine mammal relocation site, the existing fuel pier, or for piers and facilities in the area (NAVFAC Southwest 2010c). Extending the fuel pier about 200 ft to the east would not interfere with ESQD arcs at other surrounding piers or onshore, or increase explosive hazards for surrounding facilities. No inhabited buildings would be constructed as part of Alternative 1 (Navy 2010b), so there would be no significant impact with respect to ESQD.

<u>IR Program and RCRA Facility Assessment Sites</u>

No IRP or RCRA facility assessment sites would be disturbed by project activities at the proposed Navy marine mammal temporary relocation site or the fuel pier project site, nor would investigation/cleanup of such sites be affected. Closed IR Site 22 is located near the base of the existing fuel pier. This IR site consists of an abandoned diesel pipeline that was partially removed and partially abandoned in place. The site was issued regulatory closure in 2007. There is no known impact from closed IR Site 22 to the proposed fuel pier demolition and construction site (NAVFAC Southwest 2011c). Contaminated soil or groundwater associated with open IR Site 4 is not anticipated to be encountered in the fuel pier project (NAVFAC Southwest 2012). Therefore, with implementation of Alternative 1 there would be no significant impacts relative to IR Program and RCRA sites.

<u>County of San Diego Unauthorized Release Sites and SWRCB Underground Storage Tank Sites</u>

There are no unauthorized release sites at the fuel pier project site or the marine mammal temporary relocation site at NMAWC. Cleanup has been completed, and No Further Action Status assigned, for several sites near the fuel pier (RWQCB 2005, SWRCB 2011a). Cleanup has also been completed, and the case is closed, for a release at Pier 619 (Navy marine mammal temporary relocation site) (SWRCB 2011b). Implementation of Alternative 1 would not have a significant impact with respect to these closed sites. In the event that suspect contaminated soil and/or groundwater is encountered, it would be analyzed and the Navy would consult with regulatory agencies to develop an appropriate course of action regarding further evaluation and potential remediation.

Bulk Fuel Pipelines

The Navy would work with contractors to establish a safety buffer zone between the underwater fuel pipelines to NAS North Island and the demolition/construction work zone and dredge footprint, and would ensure that all contractors' equipment and vessels remain outside the buffer zone during demolition, construction, and dredging. The contractor would coordinate their activities with Navy FLC DFSP Fuel Pier personnel to avoid potential accidents.

Before the fuel pier is demolished, all fuel, lubricating oil, and CPP inside the pipelines on the fuel pier would be pumped out. The fuel and lubricating oil lines would then be disconnected from the fuel supply system. All the lines, including the CPP line, would be flushed with high-pressure water from the fuel pier's existing water supply lines. The cleaning water would be pumped through the CPP pipeline for treatment at the NBPL DFSP FOR system. After the cleaning water was pumped out of the CPP pipeline, the fuel pier segment of the fuel CPP piping system would be cut and capped.

In the event of an accidental spill of oil or hazardous substance at Naval Base Point Loma, the Emergency Response Action Plan, and in particular the Red Plan (these two plans comprise the first 26 pages of the ICP) would be followed for immediate action:

1) Stop the product flow – Stop transfers, secure pumps, and close valves
2) Warn personnel – Sound alarms, enforce safety and security actions
3) Shut off ignition sources – Motors, electric circuits, and open flames
4) Contain the spill – Secure valves, block drains, and deploy boom
5) Notify authorities – Ensure the Command Duty Officer is called and the (federal) fire department is advised if the situation warrants

The NBPL Emergency Response Action Plan specifically calls out two external agencies that must be notified of reportable spills: the National Response Center and California Emergency Management Agency. The emergency response procedures would minimize potential effects of accidental spills. Reportable spills are publicly available on the California Emergency Management Agency website at http://w3.calema1212.ca.gov/operational/malhaz.nsf/$defaultview.

The pipelines on the new fuel pier would be constructed according to applicable federal and state regulations for pipelines and marine bulk fuel transfer facilities. These regulations include specifications for pipeline design, construction, pressure testing, corrosion control, operation and maintenance, and qualifications of operator personnel (49 CFR Subtitle Part 195 Subparts A-H; CCR California Government Codes Section 51010-51019.1). The USCG and CSLC would continue to inspect fuel pier operations while the existing fuel pier remains in use during the first phase of construction, and would inspect the new pipelines when they are complete (NAVFAC Southwest 2011d). Under Alternative 1, the pipelines on the new fuel pier would hold a total of 49,000 gallons, an increase of 22,960 gallons (approximately 88 percent) from the existing pipeline capacity of 26,040 gallons (Burns and McDonnell 2012). However, compliance with applicable regulations and regular inspections from DFSP personnel, USCG, and CSLC would minimize potential risk of releases of fuel or CPP from the new pipelines.

The oily water pipeline for the new fuel pier would be designed and tested in accordance with the requirements of CCR Title 22, Chapter 15- *Interim Status Standards for Owners and Operators of Hazardous Waste Transfer, Treatment, Storage, and Disposal Facilities, Article 10 Tank Systems* and the applicable guideline standards in the American Petroleum Institute *Standard 650 Welded Tanks for Oil Storage* (NAVFAC Southwest 2011d). Compliance with these regulations and standards would ensure that the oily water pipeline is compatible with the materials it contains, is structurally sound, and is pressure-tested and certified by an independent professional engineer before use (CCR Chapter 15, Article 10, and Section 66265.192). NBPL would also be required to submit to DEH certification from a professional engineer before the line could be used (NAVFAC Southwest 2011d). The new oily water pipeline would be designed and constructed in compliance with all applicable federal, state, and county regulations, including applicable MOTEMS and USCG requirements (NAVFAC Southwest 2011d). The new fuel pier oily water pipeline would be operated in accordance with USCG and SCLC requirements, and inspections by these agencies would continue. CPP (i.e., oily water) would be piped to the onshore DFSP FOR system for processing.

Other Hazardous Materials and Hazardous Wastes

As stated in Section 3.7.2.5, hazardous waste generated by fuel pier operations (used absorbents and oily rags) is taken to the 90-day storage facility behind Building 75, i.e., outside the fuel pier demolition and construction area, and the contractors' laydown area. Because the hazardous waste storage facility is outside the areas involved with the construction project, project activities would not affect hazardous waste management with respect to fuel pier operations. No hazardous materials would be present on the new fuel pier (other than the bulk fuels, lubricating oils, and CPP in the pipelines, described above). Hazardous waste generated at the new fuel pier would be stored at the facility behind Building 75, managed according to federal, state and county regulations, and be recycled/disposed of appropriately per the Waste Management Plan, by licensed contractors through the DRMO. Any hazardous wastes generated during operation of the new fuel pier would be subject to installation-wide EPCRA 312 and 313 reporting requirements. The SDCDEH would continue their regulatory oversight of hazardous waste activities at the new fuel pier.

Through the use of the preventive measures described above (proper management of hazardous materials and waste during construction and operation of the new fuel pier; compliance with regulations for pipeline construction and operational safety; use of the spill control and minimization procedures described in the Emergency Response Action Plan in the event of an accidental release), no increase in human health risk or environmental exposure to hazardous materials or hazardous wastes would result from implementation of Alternative 1. Therefore, implementation of Alternative 1 would not have a significant impact with respect to the use, storage, or disposal of hazardous materials or hazardous wastes.

Solid Waste

The ROI for solid waste includes NBPL, NRSW, and regional landfills including Miramar, Otay, and Sycamore Canyon Landfills. Implementation of Alternative 1 would have a significant impact with respect to solid waste if disproportionate volume of available regional landfill capacity were consumed by C & D waste resulting from the project.

As part of the project design, the contractor would be required to perform an Opportunity Assessment to verify the types and quantities of materials on the project that can be reused/recycled, identify procedures intended for a recycling, reuse, or salvage program, and prepare a solid waste management plan (NRSW 2006). A minimum of 52 percent of project waste would be required to be diverted from landfill disposal, and all concrete demolition debris would be crushed for reuse on site or hauled to local recycling facilities (NAVFAC Southwest 2011b).

Before construction would begin to prepare the NMAWC site for relocation of the Navy marine mammals, any domestic trash remaining at Building 606 and Piers 607, 548, and 619 would be removed and properly recycled/disposed per the NRSW Sustainable Solid Waste Program. The floating enclosures and walkways from the existing Navy marine mammal location would be transferred to the temporary location, and then transferred back when the construction/demolition component of Alternative 1 is complete. The guide piles would be sold to other marinas for reuse after removal from the NMAWC site. Thus, the temporary marine mammal relocation component of Alternative 1 is not anticipated to generate C & D waste.

There would be no change to the types and volume of solid waste associated with the Everingham Brothers Bait Company bait barges during the temporary relocation periods (Everingham Brothers Bait Company 2012). While at the temporary relocation site, the Everingham Brothers Bait Company would continue to contain all solid waste aboard the barges in dumpsters, and transport the waste onshore for landfill disposal. Because temporary relocation of the bait barges would represent no change from existing conditions with respect to solid waste types, volumes, or management, this component of Alternative 1 would not have a significant solid waste impact.

During demolition activities, the contractor would be required to submit monthly diversion summary reports and weight tickets from recyclers to the NAVFAC Construction and Demolition Debris Manager to prove that materials are being diverted according to the project solid waste management plan. The contractor would only be allowed to dispose of the volume of non-recyclable C & D waste as designated in the project solid waste management plan at Miramar Landfill. This would ensure that solid waste associated with the proposed project is reused/recycled to the maximum extent possible, minimizing use of regional landfill capacity for the C & D waste resulting from the proposed project (NRSW 2006).

In summary, through adherence to NRSW recycling and waste minimization requirements, reuse of the construction materials required for the Navy marine mammal temporary relocation component, implementation of Alternative 1 would have not have a significant impact to solid waste and regional landfill capacity.

3.7.3.3 Alternative 2 Delayed Dredging Alternative

Under Alternative 2, the same project components would occur as for Alternative 1. As with Alternative 1, the guide piles from the temporary Navy marine mammal relocation site would be sold for reuse at another marina. While at the selected temporary relocation site (Option 4A or 6A), the Everingham Brothers Bait Company would continue to manage fuels, hazardous materials, and hazardous waste according to applicable Federal, state and county regulations and to contain all solid waste for onshore landfill disposal. Proposed demolition of the existing fuel pier and construction of the replacement fuel pier would involve the same types and volumes of hazardous and non-hazardous materials and wastes as under Alternative 1. The same protective plans and procedures would be used for Alternative 1 to minimize impacts from hazardous materials, hazardous wastes, DMM, and C & D waste would be used for Alternative 2. Therefore, implementation of Alternative 2 would not have a significant impact with respect to hazardous materials and wastes and solid waste.

3.7.3.4 Mitigation Measures

Implementation of Alternative 1 or Alternative 2 would not have significant hazardous materials or waste impacts; therefore, no mitigation measures are proposed.

3.7.3.5 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, temporary relocation of the Everingham Bait Brothers Company bait barges, demolition, and replacement of the existing fuel pier, and associated dredging of the turning basin would not occur. Fueling operations would continue at the existing fuel pier. There would be no change from the existing conditions. Therefore, implementation of the No-Action Alternative would not have a significant impact with respect to hazardous materials and wastes.

3.8 AIRBORNE NOISE

This section provides information on airborne noise, including characterization of existing noise conditions and sensitive receptors in the general vicinity of the proposed project. Underwater noise is discussed in Section 3.2*, Fisheries,* Section 3.3, *Birds,* and Section 3.4, *Marine Mammals.* No site-specific noise data are available for this project, but information is available for the general San Diego Bay area.

3.8.1 Definition of Resource

Noise is defined as unwanted sound that interferes with normal activities or otherwise diminishes the quality of the environment. It may be intermittent or continuous, steady or impulsive, stationary or transient. There is wide diversity in responses to noise that vary not only according to the type of noise and the characteristics of the sound source, but also according to the sensitivity and expectations of the receptor, time of day, and distance between the noise source (e.g., a bulldozer) and the receptor (e.g., a person or animal).

Noise levels are measured in dB, and represented on a logarithmic scale of about 20 to 120 dB. On this scale, everyday noises range from 30 dB for a quiet room to 100 dB for a loud power lawn mower at close range. At a constant level of 70 dB, noise can be irritating and disruptive to speech; at louder levels, hearing losses can occur. A difference of 3 dB represents a doubling of sound levels in terms of energy. However, because of how we hear, it is necessary to have a 10-dB increase to be perceived as a doubling in sound. Noise measurements are usually on an "A-weighted" scale that filters out very low and very high frequencies to replicate human sensitivity. It is common to add the "A" to identify that the measurement has been made with this filtering process (A-weighted decibel measurement, or dBA).

Because noise levels vary widely during the day, it is customary to record multiple noise levels over a stated period, such as 24 hours, and then calculate the average noise level. Time-averaged noise levels form the basis for land use compatibility guidelines. For instance, the term Day-Night Average Sound Level (Ldn) is used to describe the average noise level during a 24-hour day with a penalty of 10 dBA added to nighttime sound levels (10 P.M. to 7 A.M.). Community Noise Equivalent Levels (CNEL) add a 5 dBA penalty for noise events that occur in the evening (7:00 P.M. to 10:00 P.M.), as well as a 10 dBA penalty for noise events at night (10:00 P.M. to 7:00 A.M.). Shorter measurement durations (typically 1 hour) are described as Energy Equivalent Levels (Leq) indicating the total energy contained by the sound over a given sample period. The Leq for 1 hour is the energy average noise level during the hour; specifically, the average noise based on the energy content (acoustic energy) of the sound. It can be thought of as the level of a continuous noise that has the same energy content as the fluctuating noise level. The Leq for a 24-hour period (Leq24) is the Ldn/CNEL without the penalties.

Airborne sound can be transmitted into the water. However, the amount of acoustic energy directly transmitted from a source is limited due to reflection (sound wave bouncing back) and refraction (sound wave bending away from the original path). Sound transmission in shallow water is also influenced by reflection losses from the bottom and the surface, refraction from sound speed gradients, reflection, and refraction from shallow bottom layers, and scattering from rough surfaces. Underwater noise is discussed in Section 3.2*, Fisheries,* Section 3.3, *Birds,* and Section 3.4, *Marine Mammals*.

3.8.2 Affected Environment

Land use compatibility with differing noise levels is regulated at the local level, although the federal government has established suggested land use compatibility criteria for different noise zones (Federal Interagency Committee on Urban Noise [FICUN] 1980). Based on the 1980 FICUN Land Use Guidelines (Table 2), residential areas and schools are considered compatible where the Ldn is up to 65 dBA; outdoor recreational activities such as fishing and golfing are compatible with noise levels up to 70 dBA; and parks are compatible with noise levels up to 75 dBA (FICUN 1980).

The City of San Diego has an exterior noise level standard of 65 dBA CNEL for noise-sensitive land uses (e.g., residential areas, hospitals, childcare facilities, schools). This standard protects sensitive land uses such as these from high noise levels and guides the City's future planning decisions (City of San Diego 2007). The City of San Diego construction noise ordinance places a restriction of an average sound level (Leq) of 75 dBA or less during the 12-hour period from 7 A.M. to 7 P.M. (City of San Diego 2010). The ordinance also limits construction activity outside of these hours and during certain days (i.e., Sundays and major holidays) where it may create an excessive impact on neighboring sites (City of San Diego 2010).

For listeners with normal hearing and fluency in the language, complete sentence intelligibility can be achieved when the signal-to-noise ratio (i.e., the difference between the speech level and the level of the interfering noise) is in the range of 15 to 18 dBA (Lazarus 1990). The American National Standard Institute (ANSI) recommends at least a 15-dBA signal-to-noise ratio in classrooms, to ensure that children with hearing impairments and language disabilities are able to enjoy high speech intelligibility (ANSI 2002). As such, provided that the average adult male or female voice registers a minimum of 50 dBA in the rear of the classroom, the ANSI standard requires that the continuous background noise level indoors must not exceed a Leq of 35 dBA (assumed to apply for the duration of school hours).

The City of San Diego noise ordinances specify separate noise limits for ambient noise and construction noise levels (City of San Diego 2010). Therefore, in this EA the proposed project construction noise is analyzed independently of ambient noise levels at the project site and the surrounding area.

3.8.2.1 NMAWC

The NMAWC lies outside of the 65-dBA noise contours generated by aircraft activity at San Diego International Airport and NAS North Island (City of San Diego 2007). The primary noise sources at the project site include vessel traffic in the channel, vehicular traffic on North Harbor Drive, and air traffic associated with NAS North Island, the USCG Air Station, and San Diego International Airport.

Sensitive receptors near the proposed Navy MMP relocation site include two preschools, a Navy Child Development Center, and a high school. The nearest residential area is Navy family housing located 0.25 mi away on Tattnal Way and the Harbor Island Marina is located across the channel from NMAWC.

3.8.2.2 NBPL Fuel Pier

The proposed project site lies outside the 65-dBA noise contours generated by aircraft activity at San Diego International Airport and NAS North Island (City of San Diego 2007). Nearby ambient sources include vessel traffic in the channel, vehicular traffic, and air traffic associated with NAS North Island, the USCG Air Station, and San Diego International Airport.

The NBPL waterfront area where the project site is located is an industrial area, where ambient (i.e., background) noise levels are typically higher than in residential areas. Common daytime outdoor ambient sound levels for industrial areas range up to 67 dBA (Engineering Toolbox.com 2010). Although the project site is on Navy property and not subject to municipal requirements, for comparison, the City of San Diego allows ambient noise levels up to 75 dBA in industrial areas (City of San Diego 2007).

Sensitive receptors within NBPL boundaries include the NBPL Child Development Center (CDC), located at Building 377 on Myers Road about 0.7 mi west of the fuel pier, and a cluster of dormitories for NBPL submarine base personnel on Kerrick Road near Ballast Point about 1 mi to the south of the fuel pier.

The nearest sensitive receptor outside the NBPL boundary is the suburban residential neighborhood (La Playa) that borders NBPL to the north. Typical ambient noise levels range from 50 to 65 dBA CNEL in suburban to urban areas, and 65 to 75 dBA CNEL in downtown urban areas (USEPA 1974). Vehicle traffic on the roadways that provide the main access to the Point Loma peninsula (Rosecrans Street and Catalina Boulevard) is the main source of ambient noise in the residential neighborhood (Navy 2007). When there is no major construction activity occurring at NBPL DFSP Point Loma, noise is not intrusive or loud (Navy 2007). Also audible are periodic aircraft from San Diego International Airport, and military aircraft on NAS North Island. Noise from trucks, along with periodic construction in the area, also contributes to the ambient sound levels. Noise from these sources and NBPL DFSP operational activities are typical and not significant (Navy 2007). The City of San Diego exterior and construction noise ordinances apply at the NBPL property boundary, which is approximately 0.5 mi north of the fuel pier.

3.8.3 Environmental Consequences

3.8.3.1 Approach to Analysis

The primary factor considered in determining the significance of noise effects includes the extent or degree to which implementation of Alternative 1 or Alternative 2 would affect baseline noise environments. The primary issue of concern with regard to noise is the potential for impacts to humans and wildlife. Significant noise impacts would occur if implementation of Alternative 1 or Alternative 2 would directly or indirectly do one or both of the following:

- Increase ambient outdoor CNEL levels at noise-sensitive land uses beyond the 65-dBA CNEL land use compatibility standard for residential, education, and health care land uses.
- Establish noise-sensitive land use (residential, educational, and health care uses) in areas exposed to outdoor ambient noise levels that are higher than the 65-dBA land use compatibility standard.

Both of these criteria represent effects from long-term noise exposure once construction is complete. For this EA, less stringent guidelines are applied to temporary noise sources that are restricted to daytime hours (such as most construction and demolition activities) unless they affect noise-sensitive land uses and result in CNEL levels more than 10 dBA above the respective land use compatibility criteria. Noise levels exceeding the City of San Diego's construction noise limit of 75 dBA Leq between the hours of 7 A.M. and 7 P.M. would be considered significant.

The significance of noise impacts on marine biological resources is considered in Section 3.4 and depends on the sensitivity of the resource and magnitude of impact, considering any applicable thresholds for injury or disturbance. Consultation with the NMFS would ensure that appropriate measures are implemented to reduce impacts below a level of significance.

3.8.3.2 Alternative 1 Pier Replacement and Associated Dredging

Alternative 1 would consist of two overall phases with several components within each phase. Noise generating activities during Phase 1 include the relocation of the Navy MMP to NMAWC, Project Indicator Pile and Temporary Mooring Dolphin, Approach Pier construction, and North Pier construction. Construction of the new south pier and demolition of the existing approach pier comprise Phase 2. Temporary relocation of the bait barges and amendments to the Regulated Navigation Zones would not involve noise-generating activities, so these two project components are not addressed in detail for noise impacts. Project activities that involve demolition and construction would occur during the daylight hours on weekdays using standard equipment ranging from trucks and cranes to pile drivers, all of which would create noise. To assess potential impacts of this noise, estimated on-site equipment usage was modeled using the Federal Highway Administration's Roadway Construction Noise Model (RCNM) (USDOT 2008) (Appendix F). Since the City of San Diego noise ordinances contain specific stipulations for construction noise, the project-related noise assessment focuses on the output of the RCNM model. The results calculated by the model are conservative. Noise levels in the model originated from data developed by the USEPA, and were refined using an "acoustical usage factor" to estimate the fraction of time each piece of construction equipment would be operating at full power (i.e., its loudest condition) during the project (USDOT 2008).

The RCNM calculates acoustic sound levels at identified receptor points, and reports maximum sound level (Lmax) and Leq at those points. Under the Proposed Action, noise-generating activities at the NMAWC site would potentially affect receptors near the NMAWC site and pier construction would affect receptors near the fuel pier. For each portion of the project, noise levels at the sensitive receptors are relative to the noise generated at the center of the construction activities and scheduled timeframe for that particular episode of construction.

<u>NMAWC Site</u>

Temporary Relocation of the Navy MMP

Before the pier replacement activities begin, the Navy MMP would be temporarily relocated to the NMAWC. Pile driving would be the dominant noise producer for the MMP portion of the project. Activities associated with the Navy MMP construction would involve a pile driver, crane, and a workboat. Other light construction equipment usage and pile-driving activities would occur during the 90-day NMAWC construction period. Only 32 repositioned and 46 new piles would be required for the proposed temporary Navy MMP facilities at NMAWC under Alternative 1 (Section 2.2.1.1). Although the piles would be small concrete piles and use smaller pile-driving equipment than used for the larger steel piles planned for the fuel pier, the calculation for this analysis used the default pile-driver noise levels in RCNM, resulting in a higher estimated noise level than would likely be produced for driving the concrete piles. The timeframe window for this portion would be between September 2013 and February 2014. Table 3.8-1 shows calculated noise levels at various representative receptors near the proposed temporary Navy MMP relocation site. All of the residential receptors would be below the 75-dBA San Diego weekday construction ordinance limit.

Table 3.8-1. Proposed Navy Temporary MMP Relocation NMAWC Site Airborne Outdoor Construction Noise Levels at Representative Receptor Points

Receptor Point	*Distance Miles (km)*	*Outdoor Construction-Related Noise (dBA Leq)*
Harbor Island West Marina	0.1 (0.17)	73.2
Fun House Preschool	0.45 (0.73)	60.8
Patrick Wade CDC (Navy family housing area north of Rosecrans Street)	0.42 (0.67)	61.5
Baypoint Preschool	0.40 (0.65)	61.9
High Tech High School	0.5 (0.8)	60.1
Tattnal Way (residential)	0.25 (0.4)	66.0

Notes: The City of San Diego Daytime Weekday Construction Ordinance Limit is 75 dBA (Leq).
CDC = Child Development Center.
Source: City of San Diego 2010.

At the Patrick Wade CDC, outdoor noise levels would be 61.4 dBA. Sound attenuation inside a building reduces noise levels by 15 to 25 dBA with windows open and closed, respectively. With windows closed, there would be a 25-dBA reduction in noise levels, so noise levels inside the preschools, high school, and Patrick Wade CDC would be very close to the indoor classroom criteria level of 35 dBA for effective hearing. These levels likely would be further attenuated because there are a number of two-story buildings between the schools and the proposed temporary Navy MMP relocation site, and all of the schools are located upwind from the MMP location. For these reasons, including that a more conservative noise level was used in the calculations, and that pile driving would be intermittent during the school day (the classroom criteria is for continuous noise levels), these construction noise levels would be considered acceptable. Considering that the noise impacts would be very short term lasting only a few days, the noise impacts associated with construction of the proposed temporary Navy MMP relocation site would not be considered significant.

<u>NBPL Fuel Pier Location</u>

Construction of the proposed replacement fuel pier would involve the demolition of the existing pier and installation of indicator and temporary mooring dolphin piles; approach pier construction; north pier construction; and south pier construction. Demolition and construction of the fuel pier would involve typical construction equipment including: impact pile driver; vibratory pile driver; tug boats; work boats; hydraulic rams; fork lift; ,excavators;, front end loaders; concrete crushing equipment; delivery trucks; and other miscellaneous equipment.

The impact pile driver is the dominant noise producer of all of the construction equipment that would be used at the NBPL site. Steel wall, concrete, and fiberglass piles would be used in this component of the project. The impact pile driver would be needed for all three types of piles (MNB 2011). The vibratory hammer would drive the steel wall piles to the majority of the required depth, and the embedment would be completed with the impact hammer. The concrete piles would be first jetted, then driven the last few feet with the impact hammer. The fiberglass fender piles would not be embedded as deeply as the other two pile types, so they would be driven for the entire length with the impact hammer (MNB 2012).

The second loudest piece of equipment that would be used for the proposed construction at the NBPL site is the vibratory pile driver; however, it would not operate at the same time as the impact pile driver. The project construction schedule calls for four pile driving episodes: Indicator Pile Driving; Approach Pier Construction; North Pier Construction; and South Pier Construction. Each episode would be separated by 6.5 months of work with no pile driving (i.e., the least tern breeding season). This would help to minimize acute noise impacts. Demolition work would not involve impact pile driving but would take place at the same time as the earlier portions of the construction. The noise associated with pile driving would be temporary and would only occur during daylight hours (a normal workday is 9.5 hours) (MNB 2011).

Fuel Pier Demolition, Indicator Piles and Temporary Mooring Dolphin Installation

Multiple pieces of construction equipment would be used to demolish the existing pier and install indicator piles and temporary mooring dolphin including cranes, wheel loaders, tugboats, and work boats. By far, the impact pile driver is the loudest piece of equipment planned for the project. At the source, i.e., within 50 ft, of pile driving equipment RCNM uses an Lmax of 101.3 dBA and the noise level diminishes as the distance from the noise source increases. Two types of piles would be used for indicator piles, 36- or 48-in diameter steel piles (MNB 2011).

During this portion of the project, the datum for noise calculations was assumed to be in the area of the new pier alignment. The proposed schedule for the pile driving is in March of 2014. Two sensitive receptors landside of the site have been identified: the residential neighborhood of La Playa north of NBPL and the CDC at Building 377 inside NBPL. Both are approximately 0.5 mi away from the proposed project site. These points are areas with land uses that could be sensitive to elevated noise levels.

Potential noise levels from construction activities during the approach pier construction at the two sensitive receptor areas are listed in Table 3.8-2. Model results indicate that noise levels at the La Playa neighborhood would be less than the City of San Diego 75 dBA construction noise limit. Consistent with the RCNM methodology used for this assessment, the ambient noise and construction noise are not added as a cumulative level for comparisons to the noise ordinance. At the NBPL CDC, outdoor noise levels would be 60.6 dBA. Sound attenuation inside a building reduces noise levels by 15 to 25 dBA with windows open and closed, respectively. The classroom criterion for recommended indoor noise levels is 35 dBA. With windows closed during pile driving operations, the classroom criteria (60.6 dBA - 25 dBA = 35.6 dBA) for effective hearing would be slightly exceeded; however, the limit assumes continual noise throughout the school day but impact pile driving would occur intermittently throughout the school day. Although not quantifiable without actual in situ noise measurements, the relatively new NBPL CDC building itself may provide greater than 25 dBA reduction in noise levels. The design and construction materials of modern buildings often have much better sound attenuation than older structures.

Table 3.8-2. Indicator Piles and Mooring Dolphin Airborne Outdoor Construction Noise Levels at Representative Receptor Points

Receptor Point	*Distance Miles (km)*	*Construction-Related Noise (dBA Leq)*
La Playa	0.48 (0.78)	61.0
CDC NBPL (Building 377)	0.45 (0.50)	60.6

Noise from demolition activities without pile driving for the North Pier was calculated to be 58.1 dBA measured from the center of the pier to the base boundary at La Playa at 0.47 mi (0.76 km). The CDC is approximately the same distance of 0.47 mi (0.76 km).

Approach Pier Construction

Pile-driving and multiple pieces of other construction equipment would be used to construct the approach pier including cranes, wheel loaders, tug boats, and work boats. The impact pile driver is the loudest piece of equipment planned for the project. At the source, i.e., within 50 ft of pile driving equipment, RCNM uses an Lmax of 101.3 dBA and the noise level diminishes as the distance from the noise source increases. Two sizes of piles would be used for abutment (24 piles) and structural piles (105 piles): 36- or 48-in diameter steel piles (MNB 2011). Fiberglass piles (21 piles) would be used for fender piles.

During this portion of the project, the datum for noise calculations was assumed to be in the center of the new approach pier alignment. The proposed schedule for this portion of the project would start after the 2014 least tern breeding season in mid-September and continue until mid-November. Similar to the previously mentioned indicator pile driving component of this project, potential sensitive receptors would be the neighborhood of La Playa and the NBPL CDC (Building 377). Both are approximately a half mile away from the project site, but La Playa is just off-base to the north and the CDC is on-base to the west. These points represent areas with land uses that could be sensitive to elevated noise levels.

Potential noise levels from construction activities during the approach pier construction at the two sensitive receptors are listed in Table 3.8-3. Model results indicate that noise levels at the residential receptor points would be less than the City of San Diego 75 dBA construction noise limit. Consistent with the RCNM methodology used for this assessment, the ambient noise and construction noise are not added as a cumulative level for comparisons to the noise ordinance. At the CDC, outdoor noise levels would be 62.9 dBA. Sound attenuation inside a building reduces noise levels by 15 to 25 dBA with windows open and closed, respectively. The classroom criterion for recommended indoor noise levels is 35 dBA. With windows closed during pile driving operations, the classroom criteria (63.2 dBA - 25 dBA = 38.2 dBA) for effective hearing would be slightly exceeded; however, the limit assumes continual noise throughout the school day but impact pile driving would occur intermittently throughout the school day. Although not quantifiable without actual in situ noise measurements, the relatively new NBPL CDC building itself may reduce interior noise levels to below 35 dB. The design and construction materials of modern buildings often have much better sound attenuation than older structures.

Table 3.8-3. Approach Pier Airborne Outdoor Construction Noise Levels at Representative Receptor Points

Receptor Point	*Distance Miles (km)*	*Construction-Related Noise (dBA Leq)*	
		With Pile Driving	*Without Pile Driving*
La Playa neighborhood	0.47 (0.73)	62.3	57.7
CDC NBPL (Building 377)	0.42 (0.68)	63.2	58.6

North Pier Construction

Pile-driving and multiple pieces of other construction equipment would be used to construct the north pier including cranes, wheel loaders, tug boats, and work boats. By far, the impact pile driver is the loudest piece of equipment planned for the project. Two sizes of steel piles would be used for structural piles (93 piles) and mooring dolphin piles (16 piles): 36- or 48-in diameter steel piles (MNB 2011). Concrete primary fender piles (88 piles) and fiberglass secondary fender piles (25 piles) would be used also be driven.

During this portion of the project, the datum for noise calculations was assumed to be in the center of the new approach pier alignment. The proposed schedule for pile driving the steel structural and mooring dolphin piles portion of the project would start after the pile driving of the piles for the approach pier in mid-November 2014 and continue through mid-January 2015. Construction without pile driving would continue through the least tern breeding season and pile driving the concrete and fiberglass fender piles would start in mid-September 2015. Similar to the previously mentioned indicator pile driving component of this project, potential sensitive receptors would be the neighborhood of La Playa and the CDC.

Potential noise levels from construction activities during the approach pier construction at the two sensitive receptors are listed in Table 3.8-4. Model results indicate that noise levels at the residential receptor points would be less than the City of San Diego 75 dBA construction noise limit. Consistent with the RCNM methodology used for this assessment, the ambient noise and construction noise are not added as a cumulative level for comparisons to the noise ordinance. At the CDC, outdoor noise levels would be 62.9 dBA. Sound attenuation inside a building reduces noise levels by 15 to 25 dBA with windows open and closed, respectively. The classroom criterion for recommended indoor noise levels is 35 dBA. With windows closed during pile driving operations, the classroom criteria (61.4 dBA - 25 dBA = 36.4 dBA) for effective hearing would be slightly exceeded; however, the limit assumes continual noise throughout the school day but impact pile driving would occur intermittently throughout the school day. Although not quantifiable without actual in situ noise measurements, the relatively new NBPL CDC building itself may provide greater than 25 dBA reduction in noise levels. The design and construction materials of modern buildings often have much better sound attenuation than older structures.

Table 3.8-4. North Pier Airborne Outdoor Construction Noise Levels at Representative Receptor Points

Receptor Point	*Distance Miles (km)*	*Construction-Related Noise (dBA Leq)*	
		With Pile Driving	*Without Pile Driving*
La Playa	0.47 (0.73)	61.7	56.7
CDC NBPL (Building 377)	0.42 (0.68)	61.4	56.4

South Pier Construction/Existing Pier Demolition

During this phase of the project, piles for south berthing pier and mooring dolphins would be driven and demolition of the existing pier would be completed. Once the mooring dolphin piles are driven, the pile driver would be moved shore-side to drive abutment piles where the existing pier meets the shore. The impact pile driver is the loudest piece of equipment planned for the project. Two sizes of steel piles would be used for the berthing/mooring dolphin piles (17 piles) and for the abutment piles (13 piles): 36- or 48-in diameter steel piles (MNB 2011).

The primary datum for noise calculations for this portion of the project was assumed to be in the center of the dolphin piles, with a secondary location at the shoreline for the abutment piles. The proposed schedule for pile driving the mooring dolphin piles and abutment piles portion of the project would start in mid-September 2016 and continue until completion around the end of September 2016. Demolition without pile driving would start in June 2016 and continue through November 2016. Similar to the previously mentioned indicator pile driving component of this project, potential sensitive receptors would be the neighborhood of La Playa and the NBPL CDC.

Potential noise levels from construction activities during the mooring dolphin construction at the two sensitive receptors are listed in Table 3.8-5. Model results indicate that noise levels at the residential receptor points would be less than the City of San Diego 75 dBA construction noise limit. Consistent with the RCNM methodology used for this assessment, the ambient noise and construction noise are not added as a cumulative level for comparisons to the noise ordinance. At the CDC, outdoor noise levels would be 62.9 dBA. Sound attenuation inside a building reduces noise levels by 15 to 25 dBA with windows open and closed, respectively. The classroom criterion for recommended indoor noise levels is 35 dBA. With windows closed during pile driving operations, the classroom criteria (for dolphin installation: 61.8 dBA - 25 dBA = 36.8 dBA and for abutment piles: 63.0 dBA – 25 dBA = 38 dBA) for effective hearing would be slightly exceeded; however, the limit assumes continual noise throughout the school day but impact pile driving would intermittently throughout the school day. Although not quantifiable without actual in situ noise measurements, the relatively new NBPL CDC building itself may provide greater than 25 dBA reduction in noise levels. The design and construction materials of modern buildings often have much better sound attenuation than older structures.

Table 3.8-5. South Pier Dolphin Installation and Existing Pier Demolition Airborne Outdoor Construction Noise Levels at Representative Receptor Points

Dolphin Installation		
Receptor Point	*Distance Miles (km)*	*Construction-Related Noise (dBA Leq)*
La Playa	0.60 (0.97)	59.1
CDC NBPL (Building 377)	0.42 (0.68)	61.8
Abutment Piles		
Receptor Point	*Distance Miles (km)*	*Construction-Related Noise (dBA Leq)*
La Playa	0.46 (0.74)	61.4
CDC NBPL (Building 377)	0.38 (0.62)	63.0

Demolition of the existing approach pier and south pier would occur during this phase of the project and the approximate centroid of the pier area was used for the distance datum for these noise calculations. Noise levels for demolition activities at La Playa and the NBPL CDC are shown in Table 3.8-6.

Table 3.8-6. Existing Pier Airborne Outdoor Demolition Noise Levels at Representative Receptor Points

Receptor Point	*Distance Miles (km)*	*Construction-Related Noise (dBA Leq)*
La Playa	0.52 (0.83)	56.8
CDC NBPL (Building 377)	0.40 (0.64)	59.0

Dredging

Mechanical dredging of the high spot in the turning basin would produce noise from the dredging equipment, tugboats, and barges, and associated human activity. No blasting would take place. The portions of the turning basin that would be dredged are adjacent to the federal channel. Noise levels associated with dredging the turning basin would therefore be comparable to those that occur during the periodic maintenance dredging of the channel by USACE. Dredging operations would take place on weekdays during daylight hours for approximately 3 months. Noise levels from dredging would be 87 dBA at 50 ft (15 m) dropping to 61 dBA at 1,000 ft (305 m) and to 55 dBA at 2,000 ft (610 m) from the source (USDOT 2008). At its closest, the proposed dredge footprint is about 0.5 mile away (approximately 2,600 ft) away from shore (see Figure1-2). The outdoor airborne noise levels associated with dredging operations that could be heard ashore in the La Playa neighborhood would be less than the City of San Diego construction noise limit of 75 dBA for residential areas. Therefore, there would be no significant noise impact associated with the dredging component of Alternative 1.

Barges transporting the dredged material to a nearshore replenishment site would also be a source of noise associated with the dredging operations. The sediment transport barges would join with existing vessel traffic in the federal channel and noise levels would be comparable to ambient levels. Any additional noise resulting from the sediment transport barges would be short-term (up to 3 months), so impacts from transporting the dredge material to a nearshore replenishment site would not be significant.

In summary, noise modeling indicates that the noise associated with the proposed demolition, construction and dredging activities would not exceed City of San Diego construction airborne outdoor noise limits for residential areas (75 dB A-weighted) which apply at the boundaries of NBPL and NMAWC. Modeling also indicates that the indoor airborne noise levels at educational facilities in the areas surrounding the proposed NBPL and NMAWC project components would be slightly greater than the classroom criteria levels for effective hearing with windows closed (35 dB A-weighted). However, because the pile driving would be intermittent rather than continual, the noise levels would be considered acceptable. The following BMPs could be used to attenuate noise further levels if a greater reduction in noise levels is desired: noise monitoring for classroom criteria; acoustic blankets around the pile driver; or use of pile cushions could be used to reduce noise levels.

The demolition, construction, and dredging noise generated under Alternative 1 would be generally consistent with the industrial waterfront nature of NBPL and would not permanently alter the overall noise environment. Therefore, with implementation of Alternative 1 there would not be a significant noise impact.

3.8.3.3 Alternative 2 Delayed Dredging Alternative

Under Alternative 2, the same project components and activities would occur as under Alternative 1. The noise impacts associated with demolition, construction, and dredging activities would be the same as those discussed under Alternative 1, i.e., the City of San Diego construction noise ordinance limits would not be exceeded and classroom criteria for effective hearing would be slightly exceeded, but the classroom noise levels would be considered acceptable because the noise would be intermittent throughout the school day. Under Alternative 2, dredging would take place years after construction is completed, so noise from dredging would occur in the absence of other project-related noise. However, the demolition, construction, and dredging noise generated under this Alternative would be generally consistent with the industrial waterfront nature of NBPL and would not permanently alter the overall noise environment. Therefore, implementation of Alternative 2 would not have a significant noise impact.

3.8.3.4 Mitigation Measures

Implementation of Alternative 1 or Alternative 2 would not result in significant airborne noise impacts; therefore, no mitigation measures are proposed.

3.8.3.5 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, temporary relocation of the Everingham Bait Brothers Company bait barges, demolition, and replacement of the existing fuel pier, and associated dredging of high spots in the turning basin would not occur. Industrial activities currently being conducted in the area would continue, and the area's acoustical environment would remain unchanged. Therefore, implementation of the No-Action Alternative would not have a significant noise impact.

3.9 AIR QUALITY

3.9.1 Definition of Resource

Air quality is defined by ambient air concentrations of specific pollutants that have been determined to be of concern with respect to the health and welfare of the general public by the USEPA. The USEPA has established National Ambient Air Quality Standards (NAAQS) for these pollutants. The seven major pollutants of concern, called "criteria pollutants," are carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), suspended particulate matter less than or equal to 10 microns in diameter (PM_{10}), fine particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), and lead (Pb). Primary NAAQS are established to protect public health. Secondary NAAQS may also be established to avoid other adverse impacts to the public welfare such as odors or visibility effects. Areas that violate a federal air quality standard are designated as nonattainment areas.

Ambient air quality refers to the atmospheric concentration of a specific compound (amount of pollutants in a specified volume of air) that occurs at a particular geographic location. The ambient air quality levels measured at a particular location are determined by the interactions of emissions, meteorology, and chemistry. Emission considerations include the types, amounts, and locations of pollutants emitted into the atmosphere. Meteorological considerations include wind and precipitation patterns affecting the distribution, dilution, and removal of pollutant emissions. Chemical reactions can transform pollutant emissions into other chemical substances. Ambient air quality data are generally reported as a mass per unit volume (e.g., micrograms per cubic meter [$\mu g/m^3$] of air) or as a volume fraction (e.g., parts per million [ppm] by volume).

Pollutant emissions typically refer to the amount of pollutants or pollutant precursors introduced into the atmosphere by a source or group of sources. Pollutant emissions contribute to the ambient air concentrations of criteria pollutants, either by directly affecting the pollutant concentrations measured in the ambient air or by interacting in the atmosphere to form criteria pollutants. Primary pollutants, such as CO, SO_2, Pb, and some particulates, are emitted directly into the atmosphere from emission sources. Secondary pollutants, such as O_3, NO_2, and some particulates, are formed through atmospheric chemical reactions that are influenced by meteorology, ultraviolet light, and other atmospheric processes. PM_{10} and $PM_{2.5}$ are generated as primary pollutants by various mechanical processes (for example, abrasion, erosion, mixing, or atomization) or combustion processes. However, fine particulate matter (PM_{10} and $PM_{2.5}$) can also be formed as secondary pollutants through chemical reactions or by gaseous pollutants condensing into fine aerosols. In general, emissions that are considered "precursors" to secondary pollutants in the atmosphere (such as Reactive Organic Gases [ROG] and oxides of nitrogen [NO_x], which are considered precursors for O_3), are the pollutants for which emissions are evaluated to control the level of O_3 in the ambient air.

The State of California has identified four additional pollutants for ambient air quality standards: visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. The California Air Resources Board (CARB) has also established the more stringent California Ambient Air Quality Standards (CAAQS). Areas within California in which ambient air concentrations of a pollutant are higher than the state and/or federal standard are considered to be nonattainment for that pollutant. Table 3.9-1 details both the federal and state ambient air quality standards.

Table 3.9-1. Ambient Air Quality Standards

Pollutant	*Averaging Time*	*NAAQS[1]*		*CAAQS*
		Primary	*Secondary*	*Concentration*
Ozone (O_3)	1-Hour	-	Same as Primary Standard	0.09 ppm (180 $\mu g/m^3$)
	8-Hour	0.075 (147 $\mu g/m^3$) ppm		0.070 ppm (137 $\mu g/m^3$)
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	None	9.0 ppm (10 mg/m^3)
	1-Hour	35 ppm (40 mg/m^3)		20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual Average	0.053 ppm (100 $\mu g/m^3$)	Same as Primary Standard	0.030 ppm (56 $\mu g/m^3$)
	1-Hour	0.100 ppm (188 $\mu g/m^3$)		0.18 ppm (338 $\mu g/m^3$)
Sulfur Dioxide (SO_2)	24-Hour	-	-	0.04 ppm (105 $\mu g/m^3$)
	3-Hour	-	0.5 ppm (1300 $\mu g/m^3$)	-
	1-Hour	75 ppb (196 $\mu g/m^3$)	-	0.25 ppm (655 $\mu g/m^3$)
Respirable Particulate Matter (PM_{10})	24-Hour	150 $\mu g/m^3$	Same as Primary Standard	50 $\mu g/m^3$
	Annual Arithmetic Mean	-		20 $\mu g/m^3$
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	35 $\mu g/m^3$	Same as Primary Standard	-
	Annual Arithmetic Mean	12 $\mu g/m^3$		12 $\mu g/m^3$
Lead (Pb)	30-Day Average	-	-	1.5 $\mu g/m^3$
	Calendar Quarter	1.5 $\mu g/m^3$	Same as Primary Standard	-
3-Month Rolling Average	Rolling 3-month Average	0.15 $\mu g/m^3$		
Hydrogen Sulfide (HS)	1-Hour	No Federal Standards		0.03 ppm (42 $\mu g/m^3$)
Sulfates (SO_4)	24-Hour			25 $\mu g/m^3$
Visibility Reducing Particles	8-Hour (10 am to 6 pm, Pacific			In sufficient amount to produce an extinction coefficient of 0.23 per

Pollutant	Averaging Time	NAAQS1		CAAQS
		Primary	Secondary	Concentration
	Standard Time)			kilometer due to particles when the relative humidity is less than 70 percent.
Vinyl chloride[2]	24 Hour			0.01 ppm (26 μg/m^3)

Notes: [1] NAAQS (other than O_3, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. For NO_2, to attain the national standard, the 3-year average of the 98th percentile of the 1-hour maximum daily concentration must not exceed 100 ppb.
[2] The CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
μg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter.
Source: CARB 2012, USEPA 2012.

Toxic air pollutants, also called hazardous air pollutants (HAPs), are a class of pollutants that do not have ambient air quality standards but are examined on an individual basis when there is a source of these pollutants. The State of California has identified particulate emissions from diesel engines as a toxic air pollutant.

3.9.2 Affected Environment

NBPL is located within San Diego County and are under the jurisdiction of the SDCAPCD. The SDCAPCD is the agency responsible for the administration of federal and state air quality laws, regulations, and policies in the San Diego Air Basin (SDAB), which is contiguous with San Diego County.

On 15 April 2004, the SDAB was designated a basic nonattainment area for the 8-hour NAAQS for O_3, and on 15 July 2005, the 1-hour NAAQS for O_3 was rescinded. The USEPA was challenged on their justification for "basic" nonattainment designations and published proposed for all "basic" nonattainment areas for the 8-hour NAAQS for O_3. The SDAB is currently classified as a marginal nonattainment area for the 8-hour O_3 NAAQS (volatile organic compounds [VOCs] and NO_x are precursors to the formation of O_3). In 1994, the SDAB attained the standard for CO; the air basin is considered a maintenance area for CO and has been subject to a maintenance plan. The SDAB is currently in attainment for the NAAQS for all other criteria pollutants. The SDAB is currently classified as a nonattainment area under the CAAQS for O_3, PM_{10}, and $PM_{2.5}$.

The SDCAPCD operates a network of ambient air monitoring stations throughout San Diego County. The purpose of the monitoring stations is to measure ambient concentrations of the pollutants and determine whether the ambient air quality meets the CAAQS and the NAAQS. The nearest ambient monitoring station to the project site is located in downtown San Diego, California.

3.9.2.1 Region of Influence

Specifically identifying the ROI for air quality requires knowledge of the type of pollutant, emission rates of the pollutant source, proximity to other emission sources, and local and regional meteorology. The ROI for the NBPL Fuel Pier is defined by the SDAB. For inert pollutants (all pollutants other than O_3 and its precursors), the ROI is generally limited to a few miles downwind from the source. However, for a photochemical pollutant such as O_3, the ROI may extend much farther downwind. O_3 is a secondary pollutant that is formed in the atmosphere by photochemical reactions of previously emitted pollutants, or precursors (ROG and NO_x). The maximum effect on O_3 levels from precursors tends to occur several hours after the time of emission during periods of high solar load and may occur many miles from the source. O_3 and O_3 precursors transported from other regions can also combine with local emissions to produce high local O_3 concentrations

3.9.2.2 Federal Requirements

Under NEPA, air quality impacts must be evaluated and assessed with regard to the significance of their impacts. NEPA is applicable to areas that are within the United States Territory, typically defined as within 12 nautical miles of shore and on land. In addition to NEPA, the CAA, General Conformity, and New Source Review (NSR) are applicable to analyses of impacts to air quality. These federal requirements are discussed in the following sections.

3.9.2.3 Clean Air Act

The USEPA is the agency responsible for enforcing the CAA of 1970 and its 1977 and 1990 amendments. The purpose of the CAA is to establish NAAQS, which classify areas as to their attainment status relative to NAAQS; develop schedules and strategies to meet the NAAQS; and to regulate emissions of criteria pollutants and air toxics to protect public health and welfare. Under the CAA, individual states are allowed to adopt ambient air quality standards and other regulations, provided they are at least as stringent as federal standards. The CAA Amendments established new deadlines for achievement of NAAQS, dependent upon the severity of nonattainment.

The USEPA requires each state to prepare a State Implementation Plan (SIP), which describes how that state will achieve compliance with NAAQS. A SIP is a compilation of goals, strategies, schedules, and enforcement actions that will lead the state into compliance with all federal air quality standards. Each change to a compliance schedule or plan must be incorporated into the SIP. In California, the SIP consists of separate elements for each air basin, depending upon the attainment status of the particular air basin.

The CAA Amendments also require that states develop an operating permit program that would require permits for all major sources of pollutants. The program would be designed to reduce criteria pollutant emissions and control emissions of HAPs by establishing control technology guidelines for various classes of emission sources. Under the CAA, state and/or local agencies may be delegated authority to administer the requirements of the CAA, including requirements to obtain permits to operate stationary sources on Navy installations. Section

3.9.2.7 discusses the local permitting requirements for equipment that is subject to these requirements.

3.9.2.4 General Conformity

Under 40 CFR Part 93 and the provisions of Part 51, Subchapter C, Chapter I, Title 40, Appendix W of the CFR, of the CAA as amended, federal agencies are required to demonstrate that federal actions conform with the applicable SIP. In order to ensure that federal activities do not hamper local efforts to control air pollution, Section 176(c) of the CAA, 42 USC 7506(c) prohibits federal agencies, departments, or instrumentalities from engaging in, supporting, providing financial assistance for, licensing, permitting or approving any action which does not conform to an approved SIP or federal implementation plan.

The USEPA general conformity rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The emission thresholds that trigger requirements of the conformity rule are called *de minimis* levels. Table 3.9-2 identifies the federal nonattainment pollutants and the relevant *de minimis* emission thresholds.

In order to demonstrate conformity with the CAA, a project must clearly demonstrate that it does not cause or contribute to any new violation of any standard in any area; increase the frequency or severity of any existing violation of any standard in any area; or delay timely attainment of any standard, any required interim emission reductions, or other milestones in any area. A conformity applicability analysis is required for each of the nonattainment pollutants or its precursor emissions.

Compliance with the conformity rule can be demonstrated in several ways. Compliance is presumed if the net increase in direct and indirect emissions from a federal action would be less than the relevant *de minimis* level. The Proposed Action must also demonstrate that its net emission increase is not regionally significant, where regionally significant is defined as 10 percent of basin-wide emissions. If net emissions exceed the relevant *de minimis* value, or if a project is regionally significant, a formal conformity determination process must be followed.

3.9.2.5 Greenhouse Gases

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. These emissions occur from natural processes and human activities. The most significant of the human activities emitting GHGs is the burning of fossil fuels. The accumulation of GHGs in the atmosphere regulates the earth's temperature. Scientific evidence indicates a trend of increasing global temperature over the past century correlating with an increase in GHG emissions from human activities.

The most common GHGs emitted from natural processes and human activities include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Examples of GHGs created and emitted primarily through human activities include fluorinated gases (hydrofluorocarbons and perfluorocarbons) and sulfur hexafluoride. Each GHG is assigned a global warming potential that is the ability of a gas or aerosol to trap heat in the atmosphere. The global warming potential scale is standardized to CO_2, which has a value of one. For example, CH_4 has a global warming potential of 21, which means that it has a global warming effect 21 times greater than CO_2 on an equal-mass basis. CO_2 is the dominant gas in terms of quantities of total GHG emissions, although other GHGs have a higher global warming potential than CO_2. Total GHG emissions from a source are often reported as a CO_2 equivalent (CO_2e). The CO_2e is calculated by multiplying the emissions of each GHG by its global warming potential and adding the results together to produce a single, combined emission rate representing all GHGs.

Federal agencies are addressing emissions of GHGs by mandating GHG reductions in federal laws and EOs, most recently EO 13423, *Strengthening Federal Environment, Energy, and Transportation Management* and EO 13514, *Energy Efficient Standby Power Devices*. Several states have passed GHG related laws as a means to reduce statewide levels of GHG emissions. In particular, the California Global Warming Solutions Act of 2006 (Assembly Bill 32) directs the State of California to reduce statewide GHG emissions to 1990 levels by the year 2020.

In an effort to reduce energy consumption, reduce dependence on petroleum, and increase the use of renewable energy resources in accordance with goals set by EO 13423 and the Energy Policy Act of 2005, the "*Navy or Marine Corps*" has implemented a number of renewable energy projects. The types of projects currently in operation within military installations include thermal and photovoltaic solar energy systems, geothermal power plants, and wind energy generators.

The potential effects of GHG emissions are by nature global and cumulative, and it is impractical to attribute climate change to individual projects. Therefore, the impact of GHG emissions associated with this project is discussed in the context of cumulative impacts in Section 4.3.9.2 of this EA.

3.9.2.6 New Source Review

A NSR is required when a source has the potential to emit any pollutant regulated under the CAA in amounts equal to or exceeding specified major source thresholds (100 or 250 tons per year), predicated on the source's industrial category. A major modification to the source also triggers a NSR. Any new or modified stationary emission source requires construction and operating permits from the SDCAPCD. Through the SDCAPCD's permitting process, all stationary sources are reviewed and are subject to a NSR process. The NSR process ensures that factors such as the availability of emission offsets and their ability to reduce emissions are addressed and conform with the SIP.

3.9.2.7 Local Requirements

In San Diego County, the SDCAPCD is the agency responsible for the administration of federal and state air quality laws, regulations, and policies. Included in the SDCAPCD's tasks are monitoring of air pollution, preparation of the SIP for the SDAB, and the promulgation of rules and regulations. The SIP includes strategies and tactics to be used to attain the federal O_3 standard within San Diego County. The SIP elements are taken from the Regional Air Quality Strategy and the SDCAPCD plan for attaining the state O_3 standard, which is more stringent than the federal standard. The SDCAPCD's rules and regulations include procedures and requirements to control the emission of pollutants and to prevent adverse impacts.

These regulations require that facilities constructing, altering, or replacing stationary equipment that may emit air pollutants obtain an Authority to Construct permit. Further, SDCAPCD regulations require stationary sources of air pollutants to obtain and maintain Permits to Operate for all stationary sources subject to the requirements of Regulation II. The Navy must submit applications to the SDCAPCD for their review and approval. The SDCAPCD is responsible for the review of applications and for the approval and issuance of these permits. Once a permit is issued, the Navy is responsible for compliance with the conditions specified in the permit, and is responsible for quantification of emissions associated with the permitted unit. The SDCAPCD does not have quantitative emissions limits for construction activities, nor for long-term emissions that may result from increased vehicle use or other mobile sources.

3.9.2.8 Current Best Management Practices

The Navy currently has a comprehensive air quality management program to comply with all federal, state, and local requirements. BMPs that are part of the Navy's air quality program are implemented at NBPL. Equipment is maintained and meets applicable emission standards (such as smog certification for on-road vehicles) in accordance with state requirements. The Navy would require equipment such as dredging equipment to obtain the necessary air permits to operate within the SDAB.

3.9.3 Environmental Consequences

This resource section focuses on activities that have the potential to result in an impact to the ambient air quality. Emissions from construction activities associated with the NBPL Pier 180 replacement project could affect air quality. Air quality impacts from proposed construction activities would occur from (1) combustion emissions due to the use of fossil fuel-powered equipment, and (2) fugitive dust emissions (PM_{10}) during construction activities including demolition. Due to the nature of the project, earthmoving and grading would not be required; dredging activities would not generate fugitive dust, as the marine sediments that would be dredged are wet.

3.9.3.1 Approach to Analysis

The air quality analysis is based on estimates of emissions from combustion of fossil fuels in heavy construction equipment and vehicles. A list of estimated equipment required for construction activities, including support boats and tugboats, heavy construction equipment, truck trips, and workforce estimates, are provided in Appendix H, along with the emission calculations for all activities. It is assumed that all construction activities would be completed over the course of a 4-year period starting in August 2013 and ending in January 2017.

Operational emissions would primarily be from mobile sources associated with the use of the pier, including Navy marine vessels and ground vehicles that would service the pier. Because the purpose of the project is to replace the aging, seismically deficient, and obsolete pier with a new pier that would improve safety and fuel receipt and delivery capabilities, the Alternative 1 is designed to serve existing needs and would not result in increases in mobile source emissions. Therefore, this analysis focuses on construction activities required to replace the pier.

Emissions Evaluation Methodology

The methodology for estimating construction emissions involves quantifying the number and type of heavy construction equipment, truck trips, worker trips, and marine vessels that would be used for the NBPL Pier 180 replacement.

Emissions from heavy construction equipment were estimated based on emission factors for specific equipment from the CARB's OFFROAD emission model, which provides emission factors for offroad equipment. Emission factors developed by the South Coast Air Quality Management District (2007) were used. Emissions were estimated by multiplying the number of each type of equipment by the hours per day, days per year, and emission factor in pounds per day. Emissions from the pile driving hammer were calculated based on the Delmag D12 hammer, assuming the hammer would use 0.95 gallons of diesel fuel per hour (Delmag 2012).

Emissions from the dredge involved in the construction project were calculated based on the engine specification for the dredge. It was assumed that the main dredge engine would be 2,935 horsepower (hp), with the auxiliary engine rated at 550 hp and the spud winch at 250 hp. It was assumed the engines would meet Tier 2 emission standards. Emissions were calculated by multiplying the emission factor for the dredge times the amount of time the dredge would be used.

Emissions from ground vehicles (worker vehicles and truck trips) involved in construction of the NBPL Fuel Pier include combustion emissions from delivery vehicles such as trucks, and emissions from the construction workforce traveling to and from the site. Emissions associated with ground vehicles were estimated based on emission factors for specific equipment, or for ground vehicles, from the CARB's Emission Factors 2011 model (CARB 2011), which provides emission factors for on-road vehicles. Emissions were estimated by multiplying the number of each type of vehicle times the estimated mileage traveled per day, and the number of days for each phase of construction.

Marine vessels would be involved in the construction of the NBPL Pier during demolition of the existing pier and construction of the new pier. The methodology for estimating marine vessel emissions involves evaluating the type of activity, the number of hours of activity, the type of propulsion engine, and the type of generator used onboard for each type of vessel. Emission factors were obtained from the USEPA (USEPA 2000).

Operational emissions would primarily be from mobile sources associated with the use of the pier, including Navy marine vessels and ground vehicles that would service the pier. Because the purpose of the Proposed Action is to replace the aging, seismically deficient, and obsolete pier with a new pier that would improve safety and fuel receipt and delivery capabilities, the Proposed Action is designed to serve existing needs and would not result in increases in mobile source emissions. Therefore, this analysis focuses on construction activities required to replace the pier.

Baseline Emissions

The emissions baseline levels provide a basis for evaluating potential emission increases associated with the Proposed Action and alternatives. For the purpose of evaluating operational emissions associated with the Proposed Action and alternatives, it was assumed that the operation of the Fuel Pier would not be altered with replacement of the pier. Accordingly, there would be no net change in operational emissions.

3.9.3.2 Alternative 1 Pier Replacement and Associated Dredging

As discussed in Chapter 2, construction of the new fuel pier would take place concurrently with demolition of the old pier. The project would be constructed in two main phases. Implementation of Alternative 1 would include the following activities:

Phase 1 – Fuel Pier Construction:

- Temporary Relocation of the Navy MMP to NMAWC
- Project Indicator Pile Program
- Temporary Mooring Dolphin
- North Segment Demolition
- Access Pier Construction
- North Pier Construction
- Mooring Dolphins

Phase 2 – South Pier Construction:

- South Pier Construction
- South Pier and Access Pier Demolition

In addition to construction of the new fuel pier, dredging for the high spot in the turning basin would be conducted under Alternative 1. Dredging could occur any time before, during, or after the construction process. There would be no dredging during the least tern breeding season, 1 April to 15 September. For the purpose of calculating emissions associated with dredging, it was assumed that dredging would be concurrent with fuel pier construction, and could occur during the maximum activity years of 2014 and 2015.

Table 3.9-2 presents a summary of the emissions associated with construction activities under Alternative 1. Emission calculations are provided in Appendix G.

Table 3.9-2. Construction Emissions for NBPL Fuel Pier Replacement with Evaluation of Conformity –Alternative 1

Construction Year	Emissions (tons/year)					
	CO^1	$VOCs^2$	$NOx^{2,3}$	SOx^3	$PM_{10}{}^3$	$PM_{2.5}{}^3$
2013	2.69	0.24	1.50	0.00	0.07	0.05
2014	15.63	3.04	39.70	0.05	1.17	1.03
2015	22.84	14.27	44.89	0.07	1.90	1.63
2016	14.24	9.75	35.52	0.05	1.26	1.10
de minimis Threshold/ Major Source Threshold[4]	100	100	100	100	100	100
Exceeds Threshold?	No	No	No	No	No	No

Notes: (1) SDAB is considered a maintenance area for the CO NAAQS.

(2) SDAB is currently classified as a marginal nonattainment area for the 8-hour O_3 NAAQS; VOCs and NOx are precursors to the formation of O_3.

(3) SDAB is in attainment of the NAAQS for NOx, SOx, PM_{10}, and $PM_{2.5}$.

(4) *de minimis* thresholds are developed from the General Conformity Rule for nonattainment and maintenance pollutants; NAAQS attainment pollutants (i.e., SOx, PM_{10}, and $PM_{2.5}$) are evaluated based on SDCAPCD major source thresholds.

Sources: USEPA 2012, SDCAPCD 2012.

As shown in Table 3.9-2, emissions would be below *de minimis* thresholds. Therefore, implementation of Alternative 1 would not have a significant impact to air quality.

General Conformity Applicability Analysis

The estimated construction emissions associated with Alternative 1 would be below the *de minimis* threshold levels for CAA conformity. Therefore, Alternative 1 would conform to the SDAB SIP and would not trigger a conformity determination under Section 176(c) of the CAA. The Navy has prepared a Record of Non-Applicability (RONA) for CAA conformity (Refer to Appendix G).

Hazardous Air Pollutants

As discussed above, the USEPA has listed 188 substances that are regulated under Section 112 of the CAA, and the State of California has identified additional substances that are regulated under state and local air toxics rule. Minor amounts of HAPs are emitted from the combustion of fossil fuels in construction equipment and vehicles. The amounts that would be emitted are small in comparison with the emissions of criteria pollutants; emission factors for most HAPs from combustion sources are roughly three or more orders of magnitude lower than emission factors for criteria pollutants.

Because the majority of activities occur in restricted areas where no sensitive receptors (i.e., residents, schools, hospitals, etc.) are located, no health effects would be anticipated from emissions of HAPs. Therefore, implementation of Alternative 1 would not have a significant impact to air quality.

3.9.3.3 Alternative 2 Delayed Dredging Alternative

As discussed in Chapter 2, implementation of Alternative 2 would involve the same construction activities described under Alternative 1, except that dredging would take place years after construction of the fuel pier and demolition of the existing pier are completed. Under this alternative, emissions associated with dredging would not occur during construction of the pier.

Table 3.9-3 presents a summary of the emissions associated with construction activities under Alternative 2. Emission calculations are provided in Appendix G.

Table 3.9-3. Construction Emissions for NBPL Fuel Pier Replacement with Evaluation of Conformity – Alternative 2

Construction Year	*Emissions (tons/year)*					
	CO[1]	*VOCs*[2]	*NOx*[2,3]	*SOx*[3]	*PM_{10}*[3]	*$PM_{2.5}$*[3]
2013	2.69	0.24	1.50	0.00	0.07	0.05
2014	14.32	2.67	34.78	0.05	1.02	0.88
2015	21.53	13.89	39.97	0.07	1.75	1.50
2016	12.94	9.38	30.60	0.05	1.11	0.97
Dredging	1.31	0.37	4.92	0.00	0.15	0.13
de minimis Threshold/ Major Source Threshold[4]	100	100	100	100	100	100
Exceeds Threshold?	No	No	No	No	No	No

Notes: (1) SDAB is considered a maintenance area for the CO NAAQS.

(2) SDAB is currently classified as a marginal nonattainment area for the 8-hour O_3 NAAQS; VOCs and NOx are precursors to the formation of O_3.

(3) SDAB is in attainment of the NAAQS for NOx, SOx, PM_{10}, and $PM_{2.5}$.

(4) *de minimis* thresholds are developed from the General Conformity Rule for nonattainment and maintenance pollutants; NAAQS attainment pollutants (i.e., SOx, PM_{10}, and $PM_{2.5}$) are evaluated based on SDCAPCD major source thresholds.

Sources: USEPA 2012, SDCAPCD 2012.

As shown in Table 3.9-3, emissions would be below *de minimis* thresholds. Therefore, implementation of Alternative 2 would not have a significant impact to air quality.

3.9.3.4 Proposed Mitigation Measures

Implementation of Alternative 1 or Alternative 2 would not have significant air quality impacts; therefore, no mitigation measures are proposed. However, current BMPs, implemented as part of the Navy's air quality management program and practices, would continue to be implemented for operations of the NPBL Fuel Pier. All necessary construction or operationally-related permits would be authorized by the SDCAPCD before project implementation occurs.

3.9.3.5 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, temporary relocation of the Everingham Bait Brothers Company bait barges, demolition, and replacement of the existing fuel pier, and associated dredging of the turning basin would not occur. As a result, no construction emissions would result from implementation of the No-Action

Alternative. With no construction emissions, the No-Action Alternative is exempt from the General Conformity Rule. Therefore, implementation of the No-Action Alternative would not have a significant impact to air quality.

3.10 TRANSPORTATION AND CIRCULATION

3.10.1 Definition of Resource

Transportation and circulation refer to the operational characteristics of a transportation network, including the network's capacity to accommodate the additional demand resulting from a proposed project. Networks may encompass many different types of facilities that serve a variety of transportation modes, such as vehicular traffic, public transit, and non-motorized travel. Because the primary effect of the Proposed Action on transportation and circulation would involve vehicular traffic, this analysis focuses on the street network that provides access to and from NBPL.

Roadway operating conditions and the adequacy of existing roadway systems to accommodate vehicle use are described in terms of average daily traffic (ADT) volumes and level of service (LOS) ratings. LOS is a method used to rate the performance of streets, intersections, and other highway facilities. Developed by the Transportation Research Board, and documented in various editions of the Highway Capacity Manual (Transportation Research Board 2010) since 1950, LOS rates performance on a scale of A to F, with LOS A reflecting free flowing conditions and LOS F representing heavily congested conditions. Table 3.10-1 summarizes the general traffic conditions associated with each LOS rating.

Table 3.10-1. Traffic Conditions Associated with LOS Ratings

LOS Rating	*Description of Traffic Conditions*
A	Traffic flows freely, with little or no restrictions to vehicle maneuvers within the traffic stream.
B	Reasonably free-flowing conditions, with slight restrictions to vehicle maneuvers within the traffic stream.
C	Traffic speed approaches free-flowing conditions, but freedom to maneuver within the traffic stream noticeably restricted.
D	Traffic speed begins to be reduced, and freedom to maneuver is seriously limited due to a high concentration of traffic.
E	Unpredictable traffic flow, with virtually no usable gaps in the traffic stream to accommodate vehicle maneuvers.
F	Unstable flow resulting in delays and the formation of queues in locations where traffic demand exceeds roadway capacity.

Source: Transportation Research Board 2010, Chapters 11 and 14.

Traffic analysis is guided by procedures and standards established by the federal, state, regional or local agency having jurisdiction over the transportation facilities that comprise the ROI. The Proposed Action and the surrounding street network are located within the City of San Diego; therefore, City of San Diego procedures are incorporated into this analysis.

The City of San Diego Traffic Impact Study Manual (City of San Diego 1998) establishes LOS criteria for roadway segments based on their physical characteristics (e.g., the number of lanes, the presence of a median, adjacent land uses, etc.) and ADT thresholds assigned to each LOS grade (City of San Diego 1998). For example, a four-lane major arterial roadway would have LOS A with an ADT of 15,000 vehicles, and LOS D at 35,000 vehicles per day. The City of San Diego considers LOS D to be the minimum acceptable LOS; LOS E and F are considered unacceptable.

3.10.2 Affected Environment

The ROI for this analysis includes the roadways in the NBPL and NMAWC areas. Roadway access to the Point Loma peninsula and NBPL is limited. There is no immediate freeway access. Two City of San Diego streets, Rosecrans Street and Catalina Boulevard/Cabrillo Memorial Drive, are the main routes leading to the Point Loma peninsula and NBPL. NBPL has access gates on both Rosecrans Street (Rosecrans Gate) and Cabrillo Memorial Drive (McClelland Gate). Due to the volume of traffic on Rosecrans Street, many NBPL workers enter via the McClelland Gate (NAVFAC Southwest 2011).

NMAWC is also accessed by way of city streets. The routes directly leading to NMAWC are North Harbor Drive and Nimitz Boulevard; Rosecrans Street via Nimitz Boulevard is also an option. The NMAWC main gate is on North Harbor Drive, at the intersection with Laning Road (see Figure 2-1).

3.10.2.1 Existing Conditions

Rosecrans Street is the major arterial roadway that connects Point Loma to the Mission Valley community, and regional transportation facilities, including Interstate (I)-5, I-8, the Old Town Transit Center, and other land uses. Rosecrans Street is approximately 5 mi long, extending from Taylor Street near I-5 southwest down the peninsula past the proposed project area, where it transitions into Fort Rosecrans Boulevard. The morning traffic peak on Rosecrans Street typically occurs between 4:00 and 6:30 A.M. This peak period is substantially earlier than traditional peak commuting periods, which typically begin after 7:00 A.M. (City of San Diego 2010). Afternoon commute volumes begin to peak at 3:00 P.M. and can continue well into the typical evening commute period after 6:00 P.M. The posted 30 to 35 mi per hour speed limits are often exceeded during off-peak hours (City of San Diego 2010).

The capacities of Rosecrans Street are defined as 40,000 vehicles per day for the four lane sections; 45,000 vehicles per day for the five lane sections; and 50,000 vehicles per day for the six lane sections. In addition, the southernmost segment of Rosecrans Street, from Talbot Street to NBPL, is defined as a two-lane major arterial, which has a capacity of 27,000 vehicles per day (City of San Diego 2010). Existing ADT volumes were obtained from the Rosecrans Corridor Mobility Study (City of San Diego 2010), supplemented where appropriate by more updated traffic data obtained from the SANDAG website (SANDAG 2012), and with 24-hour traffic counts conducted in May 2012 (see Appendix H). Table 3.10-2 presents existing LOS within the ROI. As shown in this table, all segments within the ROI are characterized by acceptable LOS D or better conditions.

Table 3.10-2. Level of Service for ROI Roadway Segments, Existing Conditions

Roadway Segment	*Street Classification* (a)	*LOS E Capacity* (b)	*Existing*		
			ADT (c)	*V/C* (d)	*LOS* (e)
Rosecrans Street					
From Nimitz Bl. To N. Harbor Dr.	4 Lane Major Arterial	40,000	33,300	0.83	D
From N. Harbor Dr. to Canon St.	4 Lane Major Arterial	40,000	34,400	0.86	D
From Canon St. to Talbot St. (f)	2 Lane Major Arterial	27,000	15,200	0.56	C
From Talbot St. to Kellogg St. (f)	2 Lane Major Arterial	27,000	10,500	0.39	A
Nimitz Boulevard					
From N. Harbor Dr. to Rosecrans St.	4 Lane Major Arterial	40,000	12,020	0.30	A
Canon Street					
From Rosecrans St. to Locust St.	2 Lane Collector	15,000	12,870	0.86	D
Laning Road					
From N. Harbor Dr. to Decatur Rd.	2 Lane Collector	15,000	6,532	0.44	B
Catalina Boulevard					
From Canon St. to Mills St.	4 Lane Collector	30,000	15,100	0.50	C
Cabrillo Memorial Drive					
From Mills St. to McClelland Rd.	2 Lane Collector	15,000	8,303	0.55	C

Notes:

Bold values segments operating at LOS E or F.

LOS = Level of Service; ADT = Average Daily Traffic volume; V/C = volume divided by capacity; Bl. = Boulevard; N. = North; Dr. = Drive; St. = Street

(a) Street classifications and LOS E Capacities for 2-lane Major Arterials were taken from the Rosecrans Corridor Mobility Study (City of San Diego 2010)

(b) LOS E Capacity obtained from City of San Diego Traffic Impact Study Manual (City of San Diego 1998)

(c) Average Daily Traffic (ADT) volumes obtained from San Diego Association of Governments Average Weekday Traffic Volumes (SANDAG 2012), from the Rosecrans Corridor Mobility Study (City of San Diego 2010), and from 24-hour counts conducted in May 2012 (Appendix I)

(d) ADT divided by LOS E Capacity

(e) City of San Diego Traffic Impact Study Manual, Table 2 (City of San Diego 1998)

(f) LOS E Capacity obtained from Rosecrans Corridor Mobility Study (City of San Diego 2010)

3.10.3 Environmental Consequences

3.10.3.1 Approach to Analysis

For the purpose of this analysis, the proposed project would result in significant impacts to transportation and circulation if it would:

- Exceed City of San Diego significance criteria on segments characterized by LOS E or LOS F conditions.

The following evaluation is based on past traffic analyses and available traffic data. Limited traffic data collection was conducted in instances where no recent traffic data was available (i.e., Laning Road north of North Harbor Drive, and Cabrillo Memorial Drive north of McClelland Road).

3.10.3.2 Alternative 1 Pier Replacement and Associated Dredging

NMAWC Site

Complete relocation of the Navy MMP would take place before any demolition or construction begins for the fuel pier replacement, so there would be no potential overlap of construction traffic for the two project components. Nearly all the construction materials involved in the Navy MMP component would arrive via water (pilings would be delivered via barge; floating enclosures and walkways would be towed by small boats), so negligible construction traffic on roadways in the ROI is anticipated. The number of construction workers needed during the NMAWC pile installation period is expected to be minimal and not anticipated to result in a significant increase in traffic.

Approximately 204 Navy MMP personnel would be stationed at the NMAWC site along with the animals during temporary relocation period. Many of these workers likely already commute into NBPL via North Harbor Drive, Nimitz Boulevard, and/or Rosecrans Street. Temporarily transferring the MMP personnel to NMAWC would redistribute existing traffic volumes, resulting in a reduction in traffic on Rosecrans Street and other roadways within the ROI. For example, inbound trips approaching from the east via North Harbor Drive would make a left turn at the Laning Road intersection in order to access NMAWC. Diversion of trips traveling along this route would reduce traffic on North Harbor Drive and Rosecrans Street. Traffic approaching from the east on Rosecrans Street would turn left onto Laning Road and continue southward on Laning Road, past North Harbor Drive, into the NMAWC site. Although traffic would be added to a segment of Laning Road, the diversion of trips would reduce traffic volumes further to the west and south, in the vicinity of NBPL.

At the end of the temporary relocation period, the enclosures and walkways would be towed back to their original locations, and the Navy MMP workers would resume their former commuting pattern. The guide piles would be transported from the NMAWC site by barge, so there would be no demolition truck traffic. As with construction, the time period to remove the guide piles would be short, and a minimal number of workers would be needed.

Fuel Pier Replacement

Under Alternative 1, demolition of the existing fuel pier would begin in 2014. It is anticipated that the proposed fuel pier replacement effort would require approximately 100 workers per day making one trip each to the site and home, i.e., 200 vehicle trips added daily to Rosecrans Street. It is estimated that overland transport of construction materials and demolition debris would add, on-average, approximately 96 trucks per day, for a daily total of about 296 vehicle trips associated with the P-151 project. In addition, for the duration of the construction/demolition period, approximately 204 Navy MMP personnel (or 408 trips) would be transferred to NMAWC. Accordingly, there would be a net reduction in traffic volumes on Rosecrans Street near NBPL.

When the construction period ends in 2017, traffic levels would return to baseline conditions. There would be no change to the number of workers employed at the new fuel pier (Navy 2012). These workers could be directed to travel to the fuel pier via Catalina Boulevard/Cabrillo

Monument Drive and the McClelland Gate to remove trips from Rosecrans Street. Operations at the new fuel pier would not result in any additional vehicle traffic to the pier (Navy 2010).

Temporary Relocation of Everingham Brothers Bait Company Bait Barges

The bait barges would be towed from their current location to the selected temporary relocation site (4A or 6A, Figure 2-2). The Navy would coordinate with the USCG to issue a Notice to Mariners for moving the bait barges to and from the temporary relocation site. Therefore, temporary relocation of the bait barges would not have a significant impact on marine traffic and circulation.

Demolition and Construction Potential Impacts to Vessel Traffic

Proposed demolition and construction activities would take place inside an existing restricted navigation zone (Security Zone) that is off-limits to civilian vessels (see Figure 2-5). Therefore, significant impacts to civilian vessel traffic would not occur.

Sediment Dredging and Disposal

This project component would occur entirely in-water. Dredged material would be transported to the beneficial reuse site periodically via barge or the hopper dredge vessel. Dredging would take place outside the federal channel. The number of vessels needed would be as follows:

- Hopper dredge - two (one dredge vessel and one assisting tug). The dredge vessel itself would transport the sediment to the reuse site.
- Clamshell dredge – six (one dredge vessel, two sediment barges, and three assisting tugs. However, there would likely be only the dredge vessel, one barge and two tugs in the project area at any given time because the second barge and its tug would be traveling to or from the SSTC beneficial reuse site.

All vessels involved with the project would follow all applicable navigation regulations and procedures. An increase of two or six vessels west of the navigation channel near the fuel pier for a period of less than 90 days would not obstruct large/commercial vessel traffic in the navigation channel. There would still be open water east of the channel for small vessel navigation. The periodic round trip movement of two vessels (the hopper or sediment barge and its assisting tug) from the proposed dredge site to the SSTC beneficial reuse site would be a minimal addition to vessel traffic in the channel and along the coast south of Point Loma. The Navy would coordinate the USCG to issue a Notice to Mariners to advise civilian vessels of the presence of the dredging vessels. Therefore, there would be no significant impacts to vehicular or vessel traffic associated with this component of Alternative 1.

Amendments to Existing Navigation Zones

The Navy has coordinated with the USCG to amend the existing Security Zone to the east of the fuel pier. Appropriate amendments of this designated zone would establish new boundaries for Navy operational areas associated with the proposed new fuel pier that would be approximately 250 ft east of the existing Security Zone boundary. There would be approximately 700 ft of open water between the amended Security Zone Boundary and the federal channel, so the impact to civilian vessel traffic would not be significant.

Baseline and Baseline Plus Project Traffic Conditions

The Baseline condition represents the estimated future traffic conditions that would exist when project construction begins (i.e., 2013). Baseline ADT volumes were estimated assuming an annual growth rate of two percent per year. This factor is consistent with the approach taken in the P-401 Traffic Impact Study (Shaw Environmental & Infrastructure 2007)[2]. It should be noted that this is a conservative approach, as the P-401 traffic report was prepared before the national economic downturn that began in 2008, and assumed future traffic growth based on pre-recession development trends[3]. Table 3.10-3 presents volumes and LOS for ROI street segments under Baseline conditions. As shown in this table, estimated future traffic growth would cause two segments of Rosecrans Street and one segment of Canon Street to deteriorate from LOS D to LOS E.

Table 3.10-4 summarizes the assignment of traffic volumes to the ROI for the following categories of project-related traffic during construction:

1) Construction employees: 100 workers, one inbound and one outbound trip = 200 trips
2) Construction trucks: 48 trucks, one trip inbound and one outbound trip = 96 trips
3) Relocated Navy MMP personnel: 204 employees, one inbound and one outbound trip = 408 trips (relocated)

The additional and relocated trips associated with Alternative 1 were assigned in accordance with the P-401 Traffic Impact Study (for construction employees and trucks), and likely travel routes (for relocated trips). As shown in Table 3.10-4, Alternative 1 would result in relatively minor traffic increases on Nimitz Boulevard (96 daily trips) and Laning Road (204 daily trips). Alternative 1 would not increase traffic volumes on Canon Street, Catalina Boulevard, or Cabrillo Memorial Drive. During project construction, there would be a net reduction in traffic on Rosecrans Street due to the temporary relocation of MMP personnel. The construction-related impacts under Alternative 1 are presented in Table 3.10-3. As shown in this table, Alternative 1 would not have any substantial effect, i.e., the LOS on roadways in the project area does not decrease with the addition of project construction traffic.

If it is desired to further reduce traffic volumes on Rosecrans Street during construction, trucks going to and from the fuel pier construction area could be staged or queued at the Navy's truck inspection site on Cabrillo Memorial Drive. Staged/queued trucks would enter and leave NBPL and the fuel pier construction site via the McClelland Gate. For informational purposes, the volumes, LOS, and significance of impact associated with this optional minimization measure are also presented in Table 3.10-3. As shown in this table, the redistribution of truck traffic resulting from the optional minimization measure would not cause any significant traffic impact.

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[2] Because of the general similarity of the P-401 project to the proposed project (i.e., construction activities at NBPL), assumptions regarding background traffic growth and truck traffic distribution contained in this EA were developed based upon the P-401 Traffic Impact Study.

[3] For example, instead of increasing, the ADT volume on Rosecrans Street from Nimitz Boulevard to North Harbor Drive *decreased* by 8.7 percent from 2008 to 2010 (SANDAG 2012).

Table 3.10-3. Level of Service for ROI Roadway Segments, Baseline and Baseline Plus Project Conditions (Construction)

Roadway Segment	*Street Classification* [(a)]	*LOS E Capacity* [(b)]	*Baseline*			*Baseline Plus Project*			*Effect*	
			ADT [(c)]	*V/C* [(d)]	*LOS* [(e)]	*ADT* [(c)]	*V/C* [(d)]	*LOS* [(e)]	*Δ in V/C* [(g)]	*Substantial?* [(h)]
Alternative 1										
Rosecrans Street										
From Nimitz Bl. To N. Harbor Dr.	4 Lane Major Arterial	40,000	35,338	0.88	**E**	35,190	0.88	**E**	(0.004)	NO
From N. Harbor Dr. to Canon St.	4 Lane Major Arterial	40,000	36,506	0.91	**E**	36,394	0.91	**E**	(0.003)	NO
From Canon St. to Talbot St. [(f)]	2 Lane Major Arterial	27,000	16,130	0.60	C	16,018	0.59	C	(0.004)	NO
From Talbot St. to Kellogg St. [(f)]	2 Lane Major Arterial	27,000	11,143	0.41	A	11,031	0.41	A	(0.004)	NO
Nimitz Boulevard										
From N. Harbor Dr. to Rosecrans St.	4 Lane Major Arterial	40,000	13,011	0.33	A	13,107	0.33	A	0.002	NO
Canon Street										
From Rosecrans St. to Locust St.	2 Lane Collector	15,000	13,931	0.93	**E**	13,931	0.93	**E**	-	NO
Laning Road										
From N. Harbor Dr. to Decatur Rd.	2 Lane Collector	15,000	6,663	0.44	B	6,867	0.46	B	0.014	NO
Catalina Boulevard										
From Canon St. to Mills St.	4 Lane Collector	30,000	16,345	0.54	C	16,345	0.54	C	-	NO
Cabrillo Memorial Drive										
From Mills St. to McClelland Rd.	2 Lane Collector	15,000	8,469	0.56	C	8,469	0.56	C	-	NO
Alternative 1, with Optional Minimization Measure [(i)]										
Rosecrans Street										
From Nimitz Bl. To N. Harbor Dr.	4 Lane Major Arterial	40,000	35,338	0.88	**E**	35,190	0.88	**E**	(0.004)	NO
From N. Harbor Dr. to Canon St.	4 Lane Major Arterial	40,000	36,506	0.91	**E**	36,394	0.91	**E**	(0.003)	NO
From Canon St. to Talbot St. [(f)]	2 Lane Major Arterial	27,000	16,130	0.60	C	15,922	0.59	C	(0.008)	NO
From Talbot St. to Kellogg St. [(f)]	2 Lane Major Arterial	27,000	11,143	0.41	A	10,935	0.40	A	(0.008)	NO
Nimitz Boulevard										
From N. Harbor Dr. to Rosecrans St.	4 Lane Major Arterial	40,000	13,011	0.33	A	13,107	0.33	A	0.002	NO
Canon Street										
From Rosecrans St. to Locust St.	2 Lane Collector	15,000	13,931	0.93	**E**	14,027	0.94	**E**	0.006	NO
Laning Road										
From N. Harbor Dr. to Decatur Rd.	2 Lane Collector	15,000	6,663	0.44	B	6,867	0.46	B	0.014	NO
Catalina Boulevard										
From Canon St. to Mills St.	4 Lane Collector	30,000	16,345	0.54	C	16,441	0.55	C	0.003	NO
Cabrillo Memorial Drive										
From Mills St. to McClelland Rd.	2 Lane Collector	15,000	8,469	0.56	C	8,565	0.57	C	0.006	NO

Notes:
Bold values indicate roadway segments operating at LOS E or F. **Bold and shaded** values indicate substantial project effect.
(a) Street classifications and LOS E Capacities for 2-lane Major Arterials were taken from the Rosecrans Corridor Mobility Study (City of San Diego 2010)
(b) LOS E Capacity obtained from City of San Diego Traffic Impact Study Manual (City of San Diego 1998)
(c) Baseline volumes factored by two percent per year to reflect future growth
(d) ADT divided by LOS E Capacity
(e) City of San Diego Traffic Impact Study Manual, Table 2 (City of San Diego 1998)
(f) LOS E Capacity obtained from Rosecrans Corridor Mobility Study (City of San Diego 2010)
(g) Baseline Plus Project V/C minus Baseline V/C
(h) City of San Diego Traffic Impact Study Manual, Table 5 (City of San Diego 1998)
(i) Staging and queuing of truck traffic at Navy's truck inspection site on Cabrillo Memorial Drive. Trip assignment is based on conservative assumption that all trucks would use this facility.

Table 3.10-4. Assignment of Project Traffic, Construction

Roadway Segment	*Construction Workers* (a)		*Construction Trucks* (d)		*MMP Personnel Relocation* (e)		*Net Traffic Assignment* (g)
	Distribution (b)	*Assignment* (c)	*Distribution* (b)	*Assignment* (c)	*Distribution* (b)	*Assignment* (f)	
Rosecrans Street							
From Nimitz Bl. To N. Harbor Dr.	82%	164	100%	96	-100%	-408	-148
From N. Harbor Dr. to Canon St.	100%	200	100%	96	-100%	-408	-112
From Canon St. to Talbot St. (f)	100%	200	100%	96	-100%	-408	-112
From Talbot St. to Kellogg St. (f)	100%	200	100%	96	-100%	-408	-112
Nimitz Boulevard							
From N. Harbor Dr. to Rosecrans St.	0%	0	100%	96	0%	0	96
Canon Street							
From Rosecrans St. to Locust St.	0%	0	0%	0	0%	0	0
Laning Road							
From N. Harbor Dr. to Decatur Rd.	0%	0	0%	0	50%	204	204
Catalina Boulevard							
From Canon St. to Mills St.	0%	0	0%	0	0%	0	0
Cabrillo Memorial Drive							
From Mills St. to McClelland Rd.	0%	0	0%	0	0%	0	0

Notes:

Bl. = Boulevard; N. = North; Dr. = Drive; St. = Street

(a) 100 workers, with one trip in and one trip out = 200 daily construction worker trips

(b) Percent of traffic on roadway segment, from P-401 Traffic Impact Study (Shaw Environmental & Infrastructure 2007)

(c) Number of trips for each category times distribution percentage

(d) 48 trucks, with one trip in and one trip out = 96 daily truck trips. A portion of construction truck traffic would be staged on Cabrillo Monument Dr. before entering NBPL via McClelland Gate. To provide a conservative analysis, 100 percent of construction truck traffic is assumed to enter the installation via this route.

(e) Temporary relocation from NBPL to NMAWC. 204 relocated MMP personnel, with one trip in and one trip out = 408 daily MMP personnel relocation trips. 50 percent of diversion trips assumed to divert to Laning Rd. from Rosecrans St. en route to NMAWC.

(f) Relocation would remove MMP personnel trips from Rosecrans Street, and add some traffic to Laning Road

(g) Combined traffic assignment for construction workers, construction trucks, NBPL diversion, and MMP personnel relocation.

In summary, implementation of Alternative 1 would not result in any change to baseline LOS on any roadway segment or intersection in the region of influence. Moreover, Alternative 1 would not cause a substantial traffic impact based on City of San Diego criteria. Therefore, implementation of Alternative 1 would not have a significant impact to transportation and circulation.

3.10.3.3 Alternative 2 Delayed Dredging Alternative

Under Alternative 2, the same project components would occur as for Alternative 1, except that with Alternative 2, dredging would occur years after the pier replacement effort is complete. Transportation and circulation impacts would be the same as described under Alternative 1. Therefore, implementation of Alternative 2 would not have a significant impact to transportation and circulation.

3.10.3.4 Mitigation Measures

Implementation of Alternative 1 or Alternative 2 would not have significant to transportation and circulation impacts; therefore, no mitigation measures are proposed.

3.10.3.5 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, temporary relocation of the Everingham Bait Brothers Company bait barges, demolition, and replacement of the existing fuel pier, and associated dredging of the high spot in the turning basin would not occur. Roadway and vessel traffic conditions would remain unchanged. Therefore, implementation of the No-Action Alternative would not have a significant impact to transportation and circulation.

3.11 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

3.11.1 Definition of Resource

Socioeconomics is a social science discipline that focuses on the attributes of human social and economic interactions within an area. Socioeconomic analyses typically address issues such as population demographics, business activity, employment and income, and environmental justice. Impacts to these fundamental socioeconomic components can also influence other systemic issues such as the availability and affordability of housing, the provision of public services (e.g., emergency services, education, health services, etc.), and the general quality of life in a community.

The primary focus of the socioeconomic analysis in this EA is on the net economic effect on employment, income, and business activity (measured by economic output) in San Diego County, related to the construction of the fuel pier and the relocation of the bait barges. The Proposed Action would involve no change in housing supply and only potentially small changes in population, demand for housing, and public services; therefore, these issues are not addressed.

In 1994, EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was issued to focus the attention of federal agencies on human health and environmental conditions in minority and low-income communities. In addition, EO 12898 aims to ensure that the environmental effects of federal actions do not fall disproportionately on low-income and minority populations. To support an evaluation of environmental justice issues, this section includes GIS maps identifying the presence of minority and low-income populations in the vicinity of the Proposed Action that could potentially be disproportionately affected.

3.11.2 Affected Environment

The ROI for socioeconomic impacts is defined as San Diego County. Socioeconomic data are provided in this section to establish baseline conditions. Data consist primarily of publicly-available information about San Diego County and, to provide perspective, the State of California and the United States.

3.11.2.1 Existing Conditions

Population Trends

Table 3.11-1 shows population in San Diego County, the State of California, and the United States from 1990 to 2010. In 2010 San Diego County had a population of 3,095,313, making it the second most populous county in California (behind Los Angeles County). Similar to the national and statewide trend, population growth in San Diego County has slowed since 1990, as population growth from 1990 to 2000 exceeded population growth from 2000 to 2010. Over the 20-year period from 1990 to 2010, San Diego County grew at a slower rate than California and the nation overall; however, in the more recent period, 2000 to 2010, population growth in San Diego County did exceed population growth in the nation overall.

Table 3.11-1. Population, 1990-2010

Location	*1990*	*2000*	*2010*	*Percent (%) Change 1990 - 2000*	*Percent (%) Change 2000 - 2010*	*Percent (%) Change 1990 - 2010*
San Diego County	2,498,016	2,813,833	3,095,313	12.6%	10.0%	23.9%
California	29,760,021	33,871,648	37,253,956	13.8%	10.0%	25.2%
USA	248,709,873	281,421,906	308,745,538	13.2%	9.7%	24.1%

Sources: United States Census Bureau (Census) 1990, 2000, 2010a.

Table 3.11-2 displays population projections, for 2020 and 2030, for San Diego County, the State of California, and the United States. From 2010 to 2020, population in San Diego County is expected to increase by 11.8 percent, exceeding population growth experienced from 2000 to 2010 (see Table 3.11-1). Population growth from 2020 to 2030 is expected to be greater in San Diego County and California than the nation overall (11.3 percent and 11 percent for San Diego and California respectively, compared to 7.3 percent for the nation). For the 20-year period from 2010 to 2030 population in San Diego County is expected to increase by 24.5 percent, slightly less than growth expected in California (25.6 percent) but greater than expected growth in the nation overall (16.1 percent). Projections suggest that by 2030 there will be 3.85 million residents of San Diego County (24.5 percent more than measured in the 2010 Census).

Table 3.11-2. Population, 2010 and Population Projections, 2020-2030

Location	*2010*	*2020*	*2030*	*Percent (%) Change 2010 - 2020*	*Percent (%) Change 2020 - 2030*	*Percent (%) Change 2010 - 2030*
San Diego County	3,095,313	3,461,629	3,853,209	11.8%	11.3%	24.5%
California	37,253,956	42,140,000	46,780,000	13.1%	11.0%	25.6%
USA	308,745,538	334,123,000	358,407,000	8.2%	7.3%	16.1%

Sources: Caltrans 2011; Census 2009, 2010a.

Demographics

As shown in Table 3.11-3, in 2010, the population of San Diego County was 68.3 percent White, 14.8 percent Hispanic or Latino, 13.2 percent Asian, 6.3 percent Black or African American, 1.7 percent American Indian or Native Alaskan, and 1 percent Native Hawaiian or Other Pacific Islander. Compared to the population of the state of California, the population of San Diego County was more White, less Hispanic or Latino, and had a similar proportion of Black or African Americans, American Indian or Native Alaskans, and Native Hawaiian or Other Pacific Islanders. In comparison to the population of the nation overall, San Diego County was less White, more Hispanic or Latino, less Black or African American, more Native Hawaiian or Other Pacific Islander, and had a similar proportion of American Indian or Alaska Natives.

Table 3.11-3. Race, Alone or in Combination[1], 2010

Location	*White (percent)*	*Hispanic or Latino (percent)*	*Asian (percent)*	*Black or African American (percent)*	*American Indian or Alaska Native (percent)*	*Native Hawaiian or Other Pacific Islander (percent)*
San Diego County	68.3%	14.8%	13.2%	6.3%	1.7%	1.0%
California	61.6%	18.4%	14.9%	7.2%	1.9%	0.8%
USA	74.8%	6.7%	5.6%	13.6%	1.7%	0.4%

Note: [1] Respondents were able to identify themselves as one or more races so percentage totals may exceed 100 percent.
Source: Census 2010a.

Table 3.11-4 presents data on educational attainment for San Diego County, the state of California, and the nation overall, as of 2010. Of the population aged 25 or older, 15 percent of San Diego residents had not completed high school, 20 percent had completed high school but not attended college, 31 percent had attended some college or received an Associate degree, and 34 percent had earned a Bachelor's degree or advanced degree. In general, San Diego County had a higher level of educational attainment in comparison to California and the nation overall. As of 2010, a higher percentage of the population of San Diego County had completed some college or received an Associate degree than the populations of California and the nation overall; also, a greater proportion of San Diego County residents had earned a Bachelors or advanced degree. San Diego County had a lower proportion of its population that had either not completed high school or had completed high school but not attended college than California and the nation overall.

Table 3.11-4. Educational Attainment[1], 2010

Education Attainment	*San Diego County (percent)*	*California (percent)*	*U.S. (percent)*
Did not complete high school	15%	19%	15%
High school or equivalent, no college	20%	21%	29%
Some college or Associate degree	31%	29%	28%
Bachelor's degree or advanced degree	34%	30%	28%

Note: [1] Educational attainment for individuals aged 25 or older.
Source: Census 2010b.

Table 3.11-5 provides household characteristics data for San Diego County, the state of California, and the nation overall. As of 2010, San Diego County had a household population of 2,918,121 (94 percent of total population) and 1,061,789 total households. The average household size was 2.75 persons per household, fewer than California but greater than the nation overall. San Diego County had a higher median household income and a higher income per household member than California and the nation overall. The number of San Diego County households with incomes below the poverty line totaled 113,963, or 10.7 percent of county households, a rate lower than California and the nation overall.

Table 3.11-5. Household Characteristics

Location	*Population in HH's[1]*	*Total Households*	*Avg. HH Size*	*Percent of Family HH's*	*Median HH Income*	*Income Per HH Member*	*HH's Below Poverty Level*	*Percent HH's Below Poverty Level*
San Diego County	2,918,121	1,061,789	2.75	66.3%	$63,069	$22,934	113,963	10.7%
California	35,810,593	12,392,852	2.89	68.6%	$60,883	$21,067	1,493,426	12.1%
USA	295,968,252	114,235,996	2.59	66.8%	$51,914	$20,044	14,865,322	13.0%

Note: [1] By definition, population in households consists of the resident population excluding people living in group quarters (i.e., 9 or more people living together who are unrelated to the householder).
HH = households
Source: Census 2010b.

Employment and Income

Table 3.11-6 provides labor force statistics for San Diego County, the state of California, and the nation overall. In 2010, the labor force of San Diego County was 1,558,186. Of the total labor force, 1,393,866 individuals were employed and 164,320 were unemployed implying an unemployment rate of 10.5 percent. The unemployment rate in San Diego County in 2010 was lower than California's (12.4 percent) but higher than the nation overall (9.6 percent). From 1990 to 2010, the labor force, the number of employed, and the number of unemployed in San Diego expanded at a greater rate than California and the nation overall; the number of individuals who were employed in San Diego County increased by 20 percent while the number of unemployed nearly tripled (increasing by 191 percent).

Table 3.11-6. Labor Force, Employment, and Unemployment, 1990, 2000, and 2010

Location	*Years*	*Labor Force*	*Employed*	*Unemployed*	*Unemployment Rate[1] (percent)*
San Diego County	1990	1,215,650	1,159,268	56,382	4.6%
	2000	1,376,008	1,322,244	53,764	3.9%
	2010	1,558,186	1,393,866	164,320	10.5%
	Percent Change 1990 to 2010	28%	20%	191%	5.9
California	1990	15,168,531	14,294,115	874,416	5.8%
	2000	16,857,578	16,024,341	833,237	4.9%
	2010	18,316,411	16,051,513	2,264,898	12.4%
	Percent Change 1990 to 2010	21%	12%	159%	6.6
USA	1990	125,840,000	118,793,000	7,047,000	5.6%
	2000	142,583,000	136,891,000	5,692,000	4.0%
	2010	153,889,000	139,064,000	14,825,000	9.6%
	Percent Change 1990 to 2010	22%	17%	110%	4.0

Note: [1] Changes in the unemployment rate, from 1990 to 2010, are expressed in terms of percentage points.
Source: U.S. Bureau of Labor Statistics (BLS) 2012a.

Table 3.11-7 shows data on employment by industry in San Diego County for the years 2000 and 2010. In terms of employment, the largest industry in San Diego County in 2010 was the Educational, Health, and Social Services industry, which employed 175,905 people (21.4 percent of industry employment). Other large industries in 2010, in terms of employment, included the Retail Trade industry (12.7 percent of employment) and the Manufacturing industry (10.4 percent of industry employment). The fastest growing industries in San Diego County from 2000 to 2010, in terms of employment, include the Construction industry (43 percent increase in employment from 2000 to 2010), the Arts, Entertainment, Recreation, Accommodation, and Food Services industry (37 percent increase), and the Transportation, Warehousing, and Utilities industry (35 percent increase). From 2000 to 2010, overall industry employment in San Diego County increased by 25 percent.

Table 3.11-7. Employment by Industry in San Diego County 2000 and 2010

Industry	*2000 Employment*	*Share of Total 2000 Employment (percent)*	*2010 Employment*	*Share of Total 2010 Employment (percent)*	*Growth Rate 2000 to 2010 (percent)*
Agriculture, forestry, fishing, hunting, and mining	5,934	0.9%	6,256	0.8%	5%
Construction	49,517	7.5%	70,951	8.6%	43%
Manufacturing	84,166	12.7%	85,943	10.4%	2%
Wholesale trade	27,174	4.1%	33,179	4.0%	22%
Retail trade	84,460	12.8%	104,614	12.7%	24%
Transportation, warehousing, and utilities	46,776	7.1%	63,024	7.6%	35%
Information	14,961	2.3%	14,762	1.8%	-1%
Finance, insurance, real estate, rental, and leasing	36,860	5.6%	46,496	5.6%	26%
Professional, scientific, management, administrative, and waste management services	50,726	7.7%	68,024	8.3%	34%
Educational, health, and social services	140,063	21.2%	175,905	21.4%	26%
Arts, entertainment, recreation, accommodation, and food services	49,494	7.5%	67,563	8.2%	37%
Other services (except public administration)	34,428	5.2%	40,190	4.9%	17%
Public administration	36,713	5.6%	47,003	5.7%	28%
Total Industry Employment	**661,272**		**823,910**		**25%**

Sources: Census 2000, 2010b.

Table 3.11-8 provides data on average annual salary for San Diego County, the state of California, and the nation overall for 2001 and 2010. Average annual pay in San Diego County in 2010, was $50,746. Average annual pay in San Diego County was lower than the California average ($53,285) but greater than the national average ($46,751). From 2001 to 2010, average annual pay in San Diego County increased at a faster pace than California and the nation overall, increasing 32 percent compared to 29 percent increases for California and the nation overall.

Table 3.11-8. Average Annual Pay[1], 2001-2010

Location	*2001*	*2010*	*Percent (%) Change*
San Diego County	$38,418	$50,746	32%
California	$41,327	$53,285	29%
USA	$36,219	$46,751	29%

Note: [1] Average annual pay for all employees covered by unemployment insurance.
Source: BLS 2012b.

Industries Related to Recreational Fishing

Table 3.11-9 provides information on number of establishments and revenue for industries in San Diego County that receive revenue in association with recreational fishing expenditures.

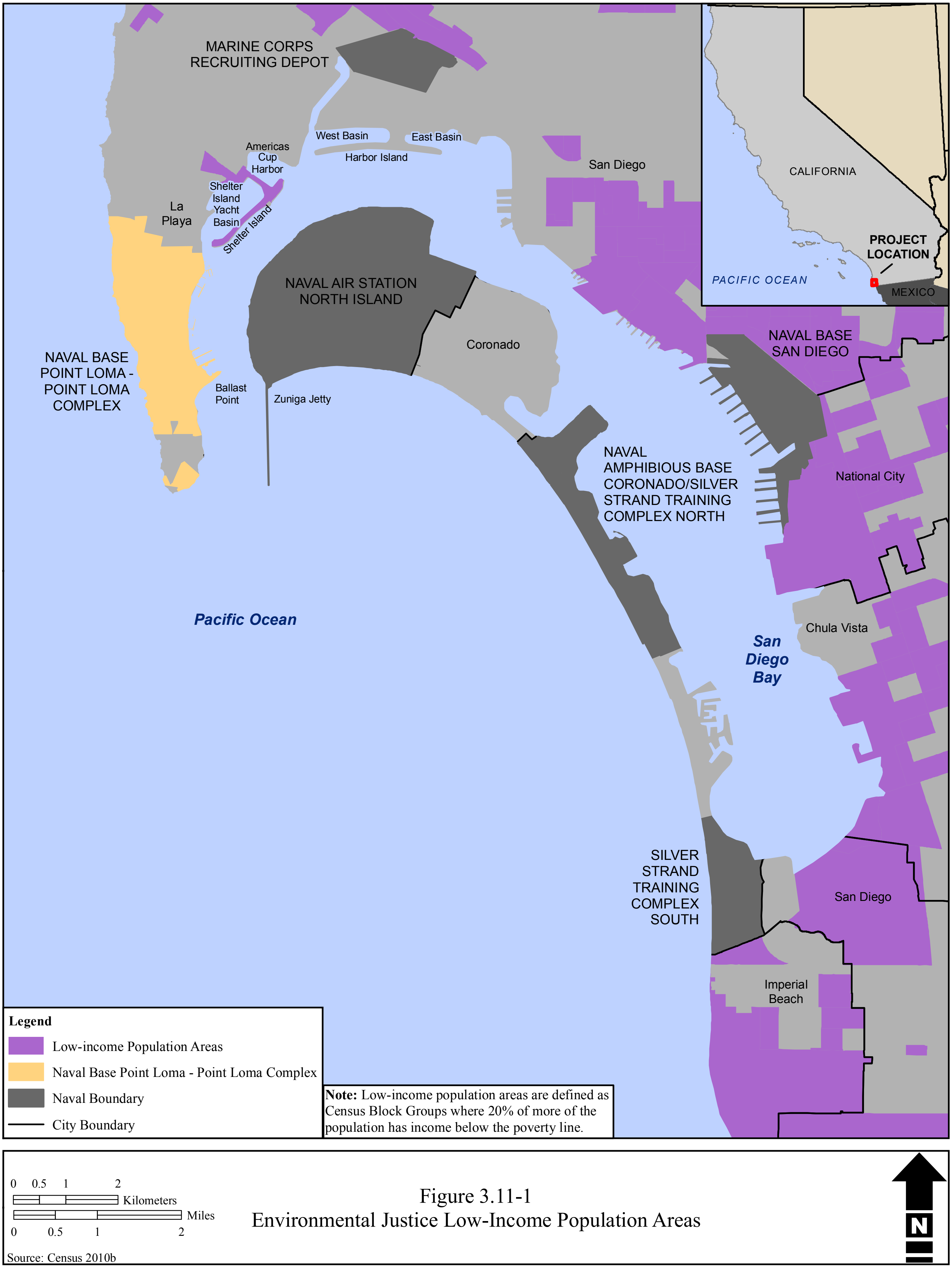
Table 3.11-9. San Diego County[1] Industries Related to Recreational Fishing, 2007

Industry	*Establishments*	*Revenue ($1,000)*
Scenic and sightseeing transportation, water[1,2]	50	$70,305
All other miscellaneous amusement and recreation services	36	$15,481
Marinas	32	$51,925
Boat dealers	139	$187,772
Boat repair	40	$38,283
Recreational goods rental	25	$16,146
Sporting goods stores	463	$449,417
Gasoline stations	666	$3,039,365
Accommodation and food services	9,258	$9,551,513
Food and beverage stores	2,254	$6,188,523
Totals	**12,963**	**$19,608,730**

Notes: [1] Data for Scenic and Sightseeing Transportation was not available for San Diego County. Data provided are for the San Diego-Carlsbad-San Marco Metro Area.
[2] Industry includes charter fishing establishments.
Sources: Census 2007a, 2007b.

Environmental Justice

Figure 3.11-1 shows environmental justice low-income population areas around San Diego Bay. The nearest low income population is located at Shelter Island. Figure 3.11-2 shows environmental justice minority population areas around San Diego Bay. There are no environmental justice low-income areas within 4 mi of the project location.



Source: Census 2010b

Figure 3.11-1
Environmental Justice Low-Income Population Areas

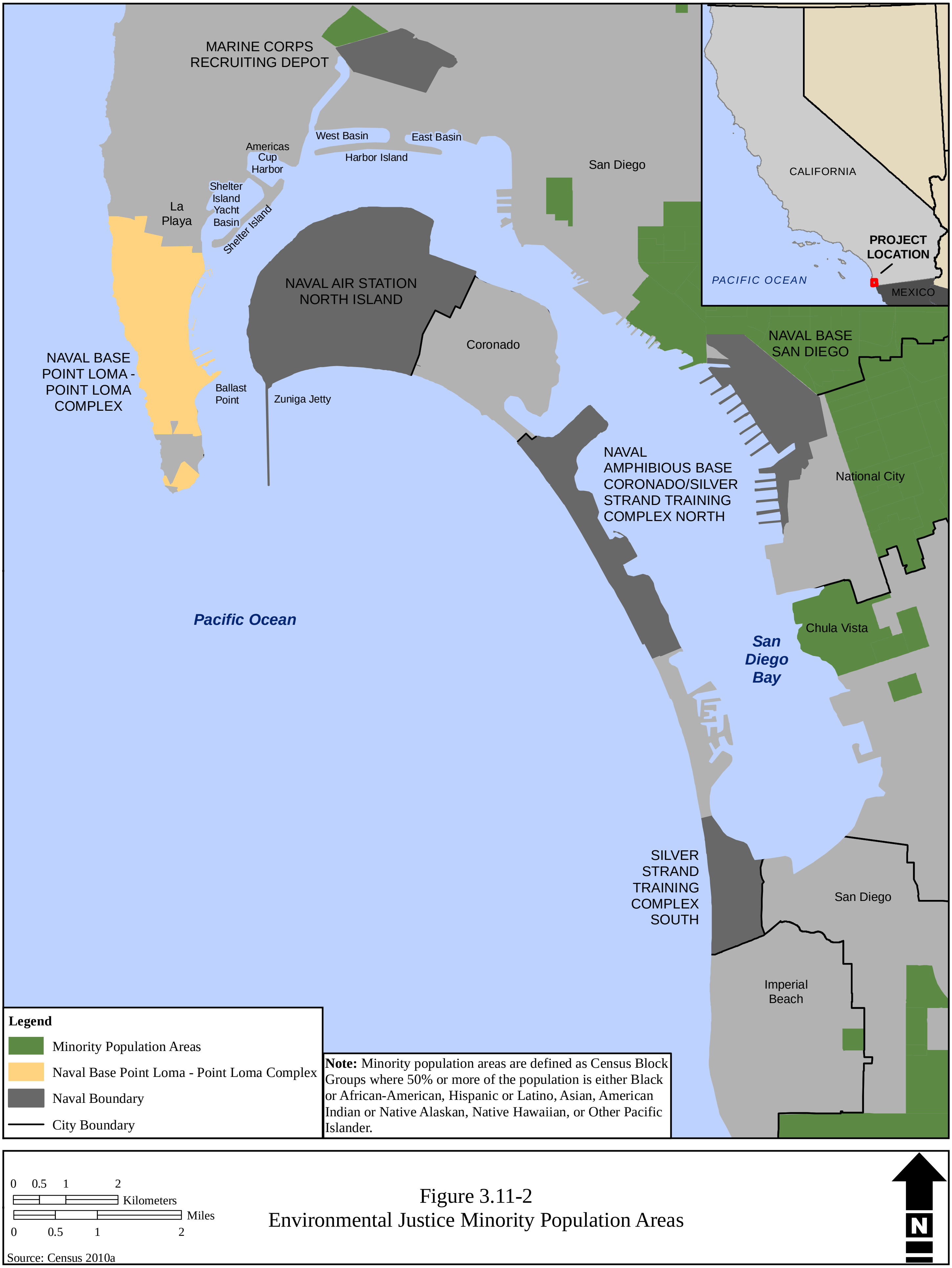


Figure 3.11-2
Environmental Justice Minority Population Areas

Source: Census 2010a

3.11.3 Environmental Consequences

3.11.3.1 Approach to Analysis

As part of the Proposed Action, the U.S. Navy would engage in a construction project to replace an existing fuel pier. As a result of expected noise from the construction, the bait barges located in San Diego Bay, near the existing fuel pier, would be required to relocate to another location in San Diego Bay. The construction project may bring new economic activity in the local construction sector; however, the relocation of the bait barges may lead to a reduction in economic activity in local industries that are supported by recreational fishing. The socioeconomic analysis measures the economic impact of this scenario, on the economy of San Diego County, by modeling the combined effect of a potential increase in expenditures in the construction sector and a potential reduction in expenditures in industries that are supported by recreational fishing. The Impact Analysis for Planning (IMPLAN) economic software model with 2010 data for San Diego County was used to estimate direct, indirect, and induced impacts.

Site activity associated with the proposed project would be expected to last for 4 years, 2013 to 2017 (construction work is estimated to be completed in late 2016; however, contractors' demobilization from the job site could run through the first weeks of 2017). Since the bait barges' relocation is contingent upon construction, the relocation would be expected to take place over the same timeframe. While multiple years are considered in the analysis, results of economic modeling are presented in constant 2011 dollars.

The following sections of the Approach to Analysis outline how inputs to the economic model (changes in expenditures related to construction and the bait barges' relocation) were estimated. In the case of the construction portion of the analysis, expected construction expenditures had been previously estimated by NAVFAC Southwest; this estimate was reviewed and then prepared for socioeconomic analysis by removing portions of expenditures that would not be expected to be spent within the economy of San Diego County and portions related to construction cost inflation. The detailed construction estimates were compared to the construction schedule so that analysis could be completed for each year of the project's life.

Inputs for the bait barges' portion of the analysis were developed by incorporating information from multiple sources including project information provided by the U.S. Navy, bait barge specific information provided by the Everingham Brothers Bait Company, publicly available recreational fishing survey data gathered by the CDFW, and recreational fishing expenditures data gathered by NOAA. Changes in expenditures related to the relocation of the bait barges are estimated for 1 year but since angler effort (annual number of trips) is considered to be stable over time and since the analysis is conducted in constant dollars, the single estimate of expenditures is utilized for each year or the project's life.

Fuel Pier Construction

The construction of the fuel pier would be expected to occur over a 3.5-year period; it would consist of six major tasks, which are listed in Table 3.11-10. For each major task of construction, Table 3.11-10 provides detail on anticipated direct construction expenditures that would be expected to take place in the San Diego County, by year, from 2013 to 2016. The single largest task of construction would be the new double deck pier, which would be expected to directly contribute over $23 million to the San Diego County economy over the 3.5-year time period. The years 2014 and 2016 would be expected to be the most active years for construction; over $13.5 million in direct expenditures within the San Diego County economy would be expected to result from the construction project in each of those years.

Table 3.11-10. Fuel Pier Replacement Direct Construction Expenditures in San Diego County, 2013-2016

Type of Expenditure	*2013*	*2014*	*2015*	*2016*	*Total*
New Double Deck Pier	$0	$7,704,526	$7,704,526	$7,704,526	**$23,113,579**
Marine Loading Arm manifolds	$0	$0	$0	$1,685,216	**$1,685,216**
Navigation Dredging and Reclamation	$1,550,400	$1,550,400	$0	$0	**$3,100,800**
Waterfront Utilities	$0	$2,078,664	$2,771,552	$1,385,776	**$6,235,991**
Waterfront Demolition	$0	$2,624,575	$0	$2,624,575	**$5,249,149**
Building Site work	$48,290	$193,159	$193,159	$193,159	**$627,767**
Totals	**$1,598,690,**	**$14,151,324**	**$10,669,237**	**$13,593,252**	**$40,012,502**

Source: NAVFAC Southwest 2011.

Data in Table 3.11-11 detail construction expenditures for material, labor, equipment, and unit costs. The Revised 35 Percent Submittal (NAVFAC 2011), which was used as the source for estimating direct construction expenditures in San Diego County, also include estimates related to escalation costs (cost inflation) and construction contractor markups; however, escalation costs and contractor markups are not included in the socioeconomic analysis. While contractor markups might serve to maintain some employment at local construction firms (administrative and marketing jobs for instance), those jobs would not be entirely attributable to the Proposed Action and so they are excluded from the economic impact analysis altogether.

Table 3.11-11. Fuel Pier Replacement Direct Construction Expenditures in San Diego County, by Type of Expenditure

Type of Expenditure	*Materials*	*Labor*	*Equipment*	*Unit Cost*	*Total*
New Double Deck Pier	$14,826,242	$5,379,027	$2,308,310	$600,000	**$23,113,579**
Marine Loading Arm manifolds	$1,452,776	$172,990	$0	$59,450	**$1,685,216**
Navigation Dredging and Reclamation	$0	$0	$0	$3,100,800	**$3,100,800**
Waterfront Utilities	$4,187,652	$1,567,120	$0	$481,219	**$6,235,991**
Waterfront Demolition	$6,525	$4,223,354	$1,019,270	$0	**$5,249,149**
Building Site work	$292,602	$249,558	$11,507	$74,100	**$627,767**
Totals	**$20,765,797**	**$11,592,049**	**$3,339,087**	**$4,315,569**	**$40,012,502**

Source: NAVFAC Southwest 2011.

The direct construction expenditures identified in Tables 3.11-10 and 3.11-11 would contribute to the number of jobs, the amount of income earned by San Diego County residents, and the overall level economic activity in the county. To determine how much of an impact that would occur, the expenditures were input into the IMPLAN model, which uses direct expenditures to estimate changes in employment, labor income, and economic output.

Bait Barge Relocation

The Everingham Brothers Bait Company bait barges provide a service demanded by the recreational fishing industry. Many party/charter fishing and private/rental fishing trips, heading out from the bay to ocean fishing areas, stop by the bait barges to purchase live bait. At its current location, the Everingham Brothers Bait Company operation is well positioned for this role – from almost every harbor or launch ramp in San Diego Bay, the bait barges are "on the way" to the ocean. During certain periods of construction; however, the bait barges would be required to relocate further into San Diego Bay, which would place them "out of the way" for most ocean fishing trips. These fishing trips would, as a result of the Proposed Action, then need to travel extra distance and spend valuable time to patronize the bait barges.

As measured in economic impacts, the relocation of the bait barges would add cost to those fishing trips that are reliant upon the bait barges. Additional cost associated with recreational fishing trips could discourage recreational fishing and potentially reduce the number of people who partake in ocean fishing trips in San Diego County. Since there are associated expenditures every time an individual takes a fishing trip (NOAA 2001), a reduction in the number of fishing trips, caused by the relocation of the bait barges, would lead to a reduction in expenditures and constitute a negative economic impact to the San Diego County economy. Any negative impacts would be expected to occur only during the years 2014 through 2016 as relocation would likely not be required in 2013 or 2017. The equation below illustrates how the direct expenditures impact of the bait barges' relocation was determined:

Number of Fishing Trips That Would Not Occur Due to the Bait Barges' Relocation (Reduction in Fishing Trips)

X

Average Expenditures per Fishing Trip

=

Total Reduction in Expenditures Due to the Bait Barges' Relocation

Reduction in Fishing Trips

For purposes of analysis, impacts related to the bait barges' relocation would occur only during periods of time when the bait barges would be relocated. Table 3.11-12 presents the anticipated location of the bait barges during each year of the 4-year construction period. There are two potential relocation sites (Options 4A and 6A) identified in Chapter 2; however, the two potential sites are near enough to each other that economic impacts would be expected to be the same for either option, thus separate economic impact analyses are not conducted for each potential relocation site.

Table 3.11-12. Anticipated Bait Barges' Location, by Month

Month	*Bait Barges' Location*
January	Relocation Site
February	Relocation Site
March	Relocation Site
April	Current Location
May	Current Location
June	Current Location
July	Current Location
August	Current Location
1-15 September	Current Location
16-30 September	Relocation Site
October	Relocation Site
November	Relocation Site
December	Relocation Site

Information on usage of the bait barges was provided by Everingham Brothers Bait Company. In 2011, the bait barges sold bait to 3,303 boats carrying 112,350 individuals; the seemingly large number of individuals per boat is a function of party/charter fishing boats, which obtain bait exclusively from the bait barges and can carry as many as 150 individuals (Everingham Brothers Bait Company 2012). The Everingham Brothers Bait Company estimated that 75 percent of their business came from party/charter boats and 25 percent came from private/rental boats. Table 3.11-13 presents information either provided by the Everingham Brothers Bait Company or estimated using data and estimation factors provided by the Everingham Brothers Bait Company.

Table 3.11-13. Bait Barge Utilization, 2011

Number of Boats Served	3,303
Total Bait Barge Customers	112,350
Total Party/Charter Customers	84,262
Total Private/Rental Customers	28,087

Source: Everingham Brothers Bait Company 2012.

Table 3.11-14 provides an estimated breakdown of the number of private/rental and party/charter fishing trips by month. The breakdown was estimated based on sample data from the California Recreational Fishing Survey (CRFS). Since the bait barges would be relocated only during certain times of the year, use of the bait barges, on a monthly basis, was estimated in order to delineate what percentage of trips would be affected by the relocation, over the course of each year. The sample data that was used for estimates in Table 3.11-14 are from 2010 and relate to all ocean fishing trips embarking from San Diego Bay, not just fishing trips that use the bait barges. However, the analysis assumes that percentages in Table 3.11-14 are representative of bait barges' utilization.

Table 3.11-14. Monthly Breakdown of Individual Fishing Trips

Month	*Party/Charter Monthly Percent (%)*	*Private/Rental Monthly Percent (%)*
January	7.1%	6.2%
February	7.5%	2.6%
March	8.2%	9.8%
April	6.7%	9.7%
May	11.4%	6.4%
June	8.5%	14.4%
July	10.3%	11.6%
August	11.1%	9.2%
September	8.2%	16.8%
October	6.4%	4.8%
November	7.8%	5.3%
December	6.9%	3.2%

Source: CDFW 2010.

Table 3.11-15 presents the percentage of party/charter and private/rental fishing trips that are estimated to occur while the bait barges would be relocated (between the middle of September and the end of March). During the portion of the year that the bait barges would be expected to be relocated, 47.9 percent of total annual party/charter fishing trips, and 40.4 percent of private/rental fishing trips are estimated to occur.

Table 3.11-15. Percentage of Individual Fishing Trips Occurring While Bait Barges are Relocated

Party/Charter	*Private/Rental*
47.9 percent	40.38 percent

Note: Sum of percentages in Table 3.11-14 for the months of January, February, March, October, November, December, and half of September.
Source: CDFW 2010.

The Everingham Brothers Bait Company indicated that they expected a reduction in private/rental business of 10 percent to 15 percent during times that the bait barges would be relocated. While the Everingham Brothers bait barge operation may lose 10 percent to 15 percent of its business in the San Diego Bay, not all of this business would be lost to the San Diego County economy. Some fishing trips that choose not to use the bait barges, because of their relocation, would proceed with their trips using bait from another source; some anglers may switch to artificial lures or they may catch their own live bait. In cases such as these, where fishing trips do not utilize the bait barges but proceed with their fishing trips, there is assumed to be no change in recreational fishing related expenditures.

However, since it is unknown how many private/rental fishing trips would be completely discouraged, the analysis applies the range provided by the Everingham Brothers Bait Company. The analysis assumes that the bait barges' private/rental business would be reduced by 15 percent. More importantly in terms of relevance to estimates of reduced recreational fishing expenditures – the assumption is made that 10 percent of the bait barges' private/rental business would be discouraged from fishing altogether.

Table 3.11-16 outlines the estimate for the number of private/rental fishing trips that would be discouraged altogether, and thus potentially lead to reductions in recreational fishing related expenditures. Annually, it is estimated that there would be a reduction of 1,134 private/rental fishing trips in San Diego County as a result of the relocation of the bait barges.

Table 3.11-16. Estimated Reduction in Private/Rental Fishing Trips, Annual

Private/Rental Bait Barge Customers	28,087
Percentage (%) of Private/Rental Customers while relocated	40.38%
Number Private/Rental Customers while relocated	11,340
Percentage (%) of Private/Rental trips that would be discouraged	10%
Estimated Reduction in Annual Private/Rental Fishing Trips	**1,134**

Sources: Everingham Brothers Bait Company 2012, CDFW 2010.

An estimate for the potential reduction in party/charter business for the bait barges was not provided by the Everingham Brothers Bait Company; the Company expects that all party/charter fishing trips would continue to use the bait barges during times when they are relocated. The Everingham Brothers Bait Company, however, did indicate that some party/charter business may be lost, indirectly, due to potentially lower quality bait (resulting from warmer water temperatures at the relocation site) and an increased potential for charter companies to raise fuel surcharges (as a result of needing to travel further to get live bait). The potential for lower quality bait and an increased fuel surcharge may lead to higher prices for party/charter customers and this may be discouraging to some potential party/charter anglers. Considering these factors, it was assumed that there was potential for a reduction in individuals who would engage in party/charter fishing trips of up to 2 percent, during times when the bait barges are relocated.

Table 3.11-17 shows the estimated reduction in the number of party/charter fishing trips; it is estimated that, annually, 807 people who would have taken a party/charter fishing trip, would not take that trip because of costs indirectly associated with the relocation of the bait barge operation.

Table 3.11-17. Estimated Reduction in Party/Charter Fishing Trips, Annual

Annual Party/Charter Bait Barge Customers	84,262
Percentage (%) Occurring While Bait Barge would be Relocated	47.9%
Percentage (%) reduction in Fishing Trips	2%
Estimated Reduction in Annual Party/Charter Fishing Trips	**807**

Source: Everingham Brothers Bait Company 2012, CDFW 2010.

Average Expenditures per Fishing Trip

In 2000, NOAA conducted a recreational fishing expenditures survey for the Pacific Coast Region and, in 2001, published a report summarizing the results (NOAA 2001). Angler trip expenditures were reported for southern California by fishing mode (private/rental and party charter), and by resident type (state resident or non-resident). Table 3.11-18 provides relevant expenditures data from that report.

Table 3.11-18. Per Trip Expenditures in Southern California by Fishing Mode and Residency, 2000

Fishing Mode	*Residents*	*Non-residents*
Party/Charter	$83	$495
Private/Rental	$37	$220

Source: NOAA 2001.

Since the expenditures survey was conducted in 2000, and impacts are presented in 2011 dollars, the expenditures presented in Table 3.11-18 were inflated to 2011 dollars. Table 3.11-19 presents results from the NOAA expenditures survey, inflated to 2011 dollars using the Consumer Price Index, which increased by 30.6 percent from 2000 to 2011.

Table 3.11-19. Per Trip Expenditures in Southern California by Fishing Mode and Residency, 2011

Fishing Mode	*Residents*	*Non-residents*
Party/Charter	$107.8	$646.2
Private/Rental	$48.8	$287.7

Sources: NOAA 2001, BLS 2012c.

CRFS sample data, from 2010, attributable to ocean fishing trips embarking from San Diego Bay, was used to establish residency, by fishing mode (party/charter or private/rental). Residency data from the NOAA survey could not be applied in this analysis as it classified residents as residents of the state of California, as opposed to residents of San Diego County, which is the region subject to analysis. CRFS data identified the county of residence of surveyed anglers, so the percentages of anglers who are residents of San Diego County were estimated using that source. Table 3.11-20 presents estimated residency status, by fishing mode (party/charter or private/rental), based on CRFS sample data from 2010.

Table 3.11-20. Per Trip Expenditures in Southern California by Fishing Mode and Residency, 2010

Fishing Mode	*Percentage (%) San Diego County Residents*	*Percentage (%) Non-residents*
Party/Charter	71.6%	28.4%
Private/Rental	91.6%	8.4%

Source: CDFW 2010.

Annual Reduction in Fishing Trip Expenditures Due to the Bait Barge Relocation

Table 3.11-21 details the estimated annual reduction in private/rental fishing trip expenditures that would be expected in San Diego County, as a result of the relocation of the bait barge operation, in 2011 dollars. An estimated total reduction in expenditures of $77,876 per year would be expected as a result of the relocation of the bait barges, $50,408 per year would be as a result of reduced expenditures by residents of San Diego County, and $27,468 per year would be expected as a result of reduced expenditures by non-residents.

Table 3.11-21. Estimated Annual Reduction in Private/Rental Fishing Trip Expenditures Due to Potential Bait Barge Relocation, in 2011 Dollars

Annual Reduction in Private/Rental Fishing Trips	1,134
Percentage (%) of Reduction from San Diego County Residents	91.6%
Reduction in Trips - San Diego County Residents	1,038
Per Trip Expenditures - San Diego County Residents	$48.5
Reduced Expenditures - San Diego County Residents	$50,408
Percentage (%) of Reduction from Non-residents	8.4%
Reduction in Trips - Non-residents	95
Per Trip Expenditures - Non-residents	$287.7
Reduced Expenditures - Non-residents	$27,468
Total Reduction in Expenditures - Private/Rental	**$77,876**

Sources: Everingham Brothers Bait Company 2012, CDFW 2010, NOAA 2001, BLS 2012c.

Table 3.11-22 details the estimated annual reduction in party/charter fishing trip expenditures that would be expected in San Diego County, as a result of the relocation of the bait barge operation, in 2011 dollars. An estimated total of $210,357 per year in reduced expenditures would be expected as a result of the relocation of the bait barges, $62,389 per year would be as a result of reduced expenditures by residents of San Diego County, and $147,968 per year would be expected as a result of reduced expenditures by non-residents.

Table 3.11-22. Estimated Annual Reduction in Party/Charter Fishing Trip Expenditures Due to Potential Bait Barge Relocation, in 2011 Dollars

Annual Reduction in Private/Rental Fishing Trips	807
Percentage (%) of Reduction from San Diego County Residents	71.6%
Reduction in Trips - San Diego County Residents	579
Per Trip Expenditures - San Diego County Residents	$107.8
Reduced Expenditures - San Diego County Residents	$62,389
Percentage (%) of Reduction from Non-residents	28.4%
Reduction in Trips - Non-residents	229
Per Trip Expenditures - Non-residents	$646.2
Reduced Expenditures - Non-residents	$147,968
Total Reduction in Expenditures - Private/Rental	**$210,357**

Sources: Everingham Brothers Bait Company 2012, CDFW 2010, NOAA 2001, BLS 2012c.

Table 3.11-23 displays total estimated annual expenditure reductions that would be expected as the result of the relocation of the bait barges. Annually, a total reduction in recreational fishing related expenditures of $288,233 would be expected as a result of the relocation of the bait barges; most of the reduction in expenditures would extend, indirectly, from a reduction in party/charter fishing trips ($210,357), and the remainder ($77,876) would extend from a reduction in private/rental trip expenditures.

Table 3.11-23. Total Estimated Annual Reduction in Recreational Fishing Trip Expenditures Due to Potential Bait Barge Relocation

Reduced Expenditures - Private/Rental Fishing Trips	$77,876
Reduced Expenditures - Party/Charter Fishing Trips	$210,357
Annual Reduction in Expenditures	**$288,233**

Sources: Everingham Brothers Bait Company 2012, CDFW 2010, NOAA 2001, BLS 2012c.

The total reduction in fishing trip expenditures that would be expected as a result of the potential relocation of the bait barges were weighted by industry according to how they were delineated in the NOAA expenditures survey. Industry weights and total value of reduced expenditures are presented in Table 3.11-24.

Table 3.11-24. Annual Reduction in Recreational Fishing Expenditures by Industry, 2011 Dollars

Expenditure Category	*Percentage (%) Weight*	*Reduced Expenditures*
Private Transportation	14%	($41,563)
Grocery Stores	10%	($28,977)
Restaurants	5%	($13,636)
Lodging	4%	($11,008)
Public Transportation	12%	($33,432)
Boat Fuel	9%	($25,374)
Party/Charter Fees	37%	($105,693)
Access/Boat Launching	2%	($5,134)
Equipment Rental	3%	($9,132)
Bait and Ice	5%	($14,286)
Total	**100%**	**($288,233)**

Source: NOAA 2001 (percentage weights).

There is the potential that some marine mammals may be drawn to areas around the bait barges near the relocation site. If this does occur, there would be the potential that these marine mammals would occupy privately owned areas that, previous to the relocation, had lesser or no marine mammal presence. If marine mammals do increase occupancy of privately owned areas, private owners may find this to be a nuisance. In the event of a nuisance, caused by marine mammals, it would be within the property owner's rights and it would be their responsibility to deter the marine mammals from causing them nuisance.

There are a variety of methods that can be legally applied to deter nuisance caused by the presence of marine mammals. Broadly, these methods include: Barriers and Exclusion Devices (such as fencing), Visual Repellents (such as flashing lights), Noise Makers (such as horns and whistles), and Physical Contact (such as water from hoses and projectiles from sling shots). Engaging in any of these methods of deterrence imposes a cost on the owner – whether it would be the cost of purchasing and installing fencing or simply the cost of time it takes to blow a whistle in the direction of a marine mammal.

Since marine mammals could be attracted to the bait barges, any new or additional presence of the marine mammals on private property would likely be associated with the relocation of the bait barges and thus the cost of deterrence would be attributable to the proposed action. If there are additional costs associated with deterrence of marine mammal nuisance on private property, brought about by the Proposed Action, it would be considered an indirect impact of the proposed action. However, since these costs would be very small relative to the regional economy, the impact would be less than significant.

Summary of Input Data

Table 3.11-25 identifies annual expenditures, as they were input into the IMPLAN model, related to construction expenditures, and reduced recreational fishing related expenditures. Construction expenditures were input into the IMPLAN sector "construction of other new nonresidential structures" and reduced recreational fishing related expenditures were input into various industries corresponding to the industries and weights identified in Table 3.11-24.

Table 3.11-25. Direct Expenditures Input into IMPLAN Model, Constant 2011 Dollars

Annual Expenditures	*2013*	*2014*	*2015*	*2016*
Construction Expenditures	$1,598,690	$14,151,324	$10,669,237	$13,593,252
Reduction in Recreational Fishing Related Expenditures	$0	($288,233)	($288,233)	($288,233)

3.11.3.2 Alternative 1 Pier Replacement and Associated Dredging

Table 3.11-26 shows the estimated number of direct, indirect, induced, and total jobs, in San Diego County, that would result from Alternative 1. Over the 4-year project period from 2013 to 2017, the impact on jobs would be expected to be, on net, positive. Increased economic activity generated by the fuel pier construction would overshadow decreased economic activity that would result from the relocation of the bait barges. During the most active years of construction, 2014 and 2016, increases of over 145 jobs would be generated within the San Diego County economy. During the least active year of construction, 2013, an estimated 18 jobs would be generated by Alternative 1. Figure 3.11-3 illustrates potential changes in jobs over the course of the proposed construction period. Overall, more jobs would be created than are lost, resulting in beneficial impacts. Therefore, there would be no significant impact to jobs from implementation of Alternative 1.

Table 3.11-26. Jobs[1] Impact, 2013-2016

Jobs Impact	*2013*	*2014*	*2015*	*2016*
Direct Effect	9	77	57	74
Indirect Effect	3	28	21	27
Induced Effect	5	46	34	44
Total Effect	**18**	**151**	**113**	**145**

Note: [1] Jobs are not Full Time Equivalent; some part-time jobs may be included in results.

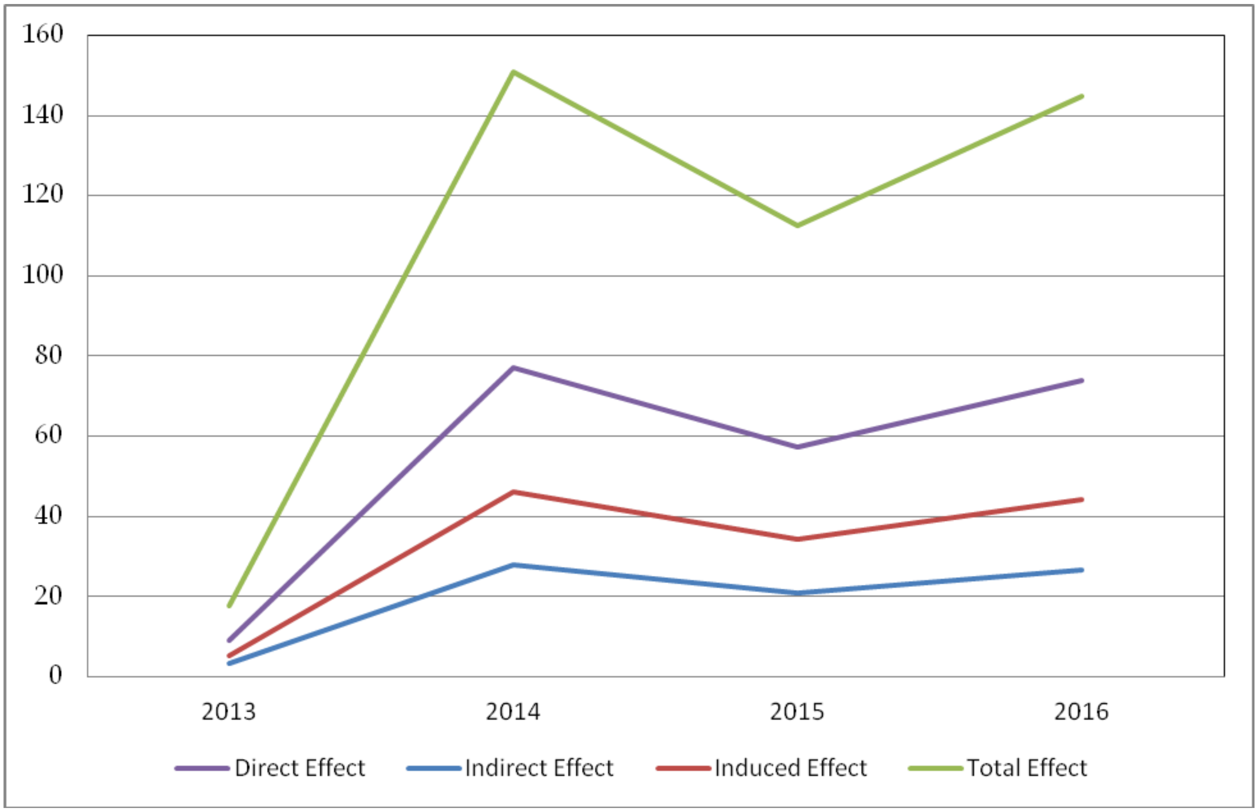


Figure 3.11-3. Jobs Impact, 2013-2016

Table 3.11-27 shows the estimated direct, indirect, induced, and total labor income, in San Diego County, that would result from Alternative 1. Over the 4-year project period from 2013 to 2017, the impact on labor income would be expected to be, on net, positive. Increased economic activity generated by the fuel pier construction would overshadow decreased economic activity that would result from the relocation of the bait barges. During the most active years of construction, 2014 and 2016, an increase of about $9 million in labor income would be generated within the San Diego County economy. During the least active year of construction (2013) $1 million in labor income would be generated by Alternative 1. Figure 3.11-4 illustrates potential changes in labor income over the course of the proposed construction period. Overall, labor income impacts from Alternative 1 would be beneficial, but less than significant.

Table 3.11-27. Labor Income Impact, 2013-2016, Constant 2011 Dollars

Labor Income Impact	*2013*	*2014*	*2015*	*2016*
Direct Effect	$646,550	$5,575,866	$4,167,624	$5,350,167
Indirect Effect	$198,427	$1,726,669	$1,294,478	$1,657,402
Induced Effect	$237,930	$2,056,256	$1,538,022	$1,973,199
Total Effect	**$1,082,907**	**$9,358,790**	**$7,000,124**	**$8,980,768**

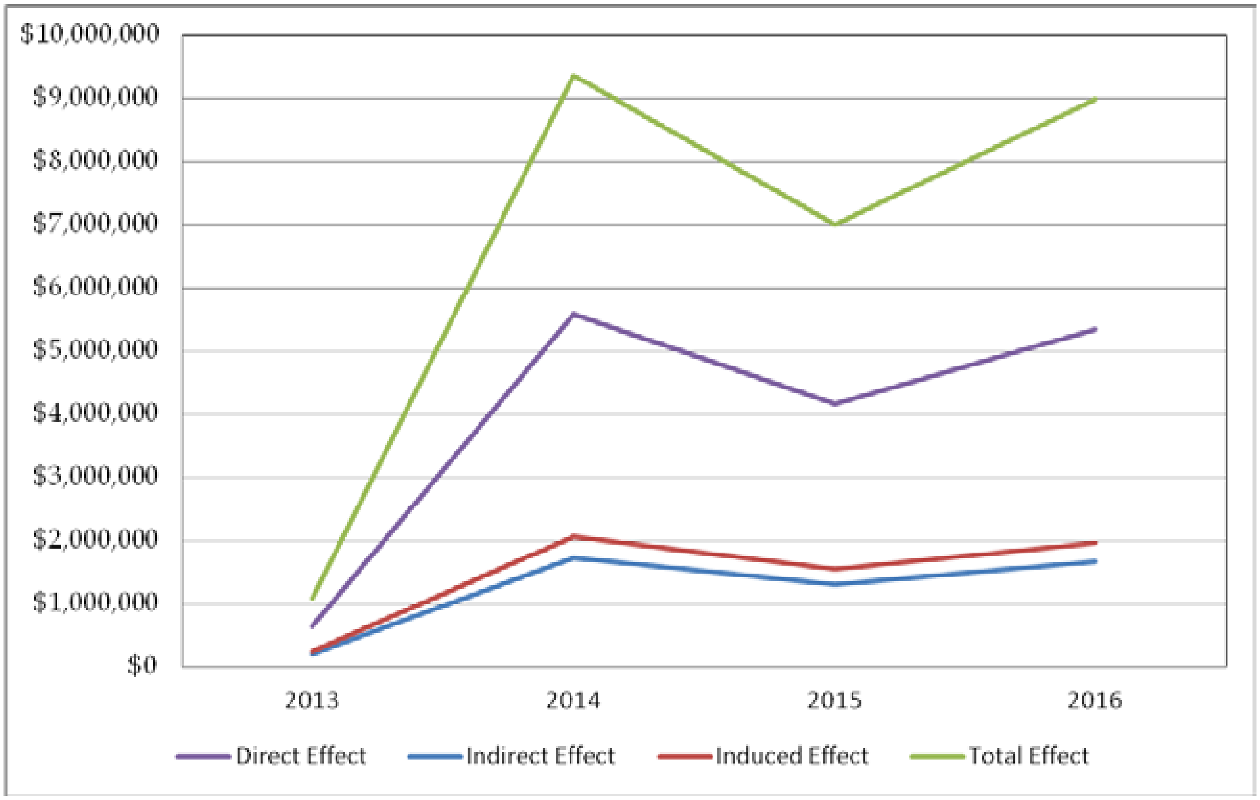


Figure 3.11-4. Labor Income Impact, 2013-2016

Table 3.11-28 shows the estimated direct, indirect, induced, and total economic output, in San Diego County, that would result from Alternative 1. Over the 4-year project period from 2013 to 2017, the impact on economic output would be expected to be, on net, positive. Increased economic activity generated by the fuel pier construction would overshadow decreased economic activity that would result from the relocation of the bait barges. During the most active years of construction, 2014 and 2016, an increase of over $23 million in economic output would be generated within the San Diego County economy. During the least active years of construction, 2013 and 2017 (years when construction activity would be building-up and winding-down, respectively), about $3 million in economic output would be generated with implementation of Alternative 1. Figure 3.11-5 illustrates potential changes in economic output over the course of the proposed construction period. Overall, labor income impacts would be beneficial. Therefore, there would be no significant impact to labor income from implementation of Alternative 1.

Table 3.11-28. Economic Output Impact, 2013-2016, Constant 2011 Dollars

Economic Output Impact	*2013*	*2014*	*2015*	*2016*
Direct Effect	$1,598,690	$13,863,089	$10,381,002	$13,305,017
Indirect Effect	$485,936	$4,227,772	$3,169,360	$4,058,141
Induced Effect	$705,278	$6,095,189	$4,559,032	$5,848,990
Total Effect	$2,798,904	$24,186,050	$18,109,394	$23,212,148

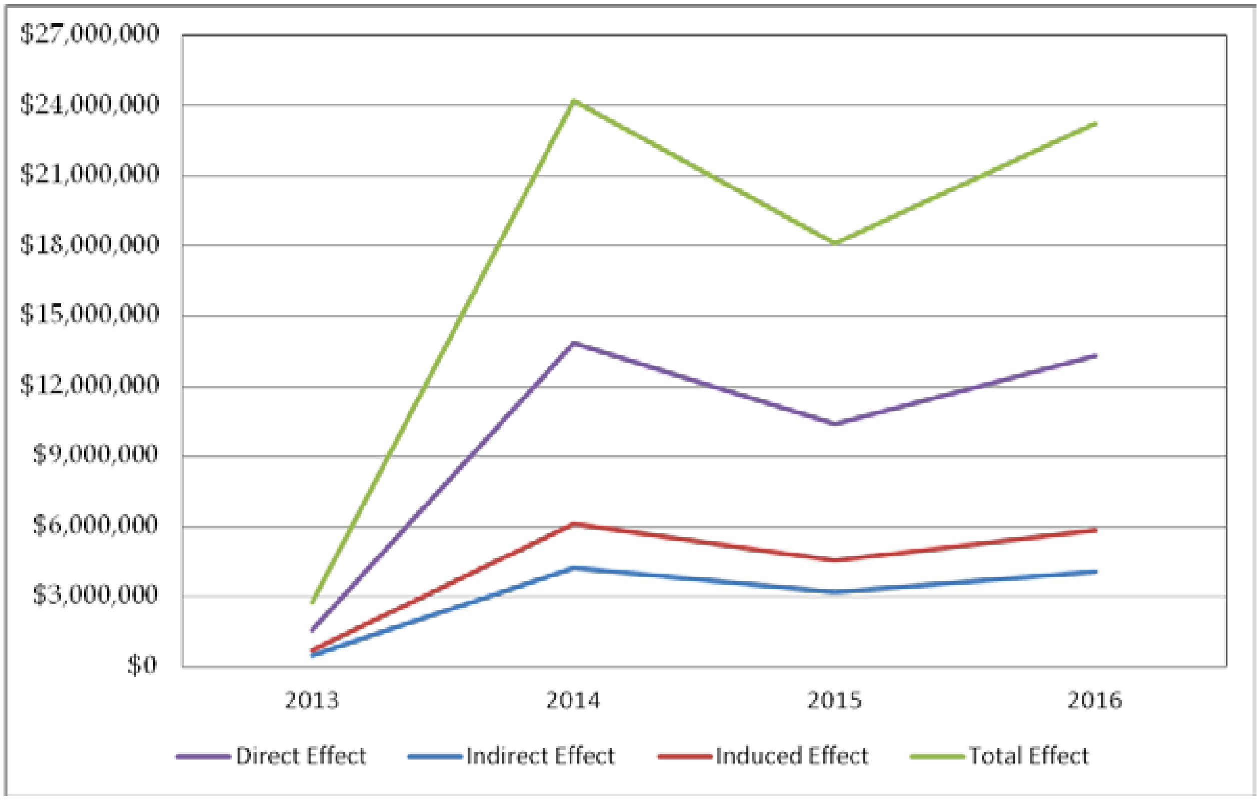


Figure 3.11-5. Economic Output Impact, 2013-2016

Overall, Alternative 1 would have a beneficial impact on the San Diego County economy; however, some industries might be negatively impacted. Charter fishing companies, for instance, may lose some business during the course of the project. This impact would be less than significant relative to the industries' overall size. In addition, the impact would be indirect, potentially stemming from increased gasoline costs and a choice by the industry as to whether it would increase gasoline surcharges (which would be a choice not entirely dependent on the location of the bait barge operation, but on broader economic conditions).

Individuals interviewed in the process of conducting this socioeconomic analysis discussed their concerns that the charter fishing industry was performing below its potential; that it was suffering from image problems and had failed to counteract those image problems by effectively promoting itself. Interviewees noted that the charter fishing is a healthy, environmentally sustainable, recreation activity. If the charter fishing industry improves its marketing profile and overall popular presence, any potential impacts from the bait barges' relocation could be more than offset. Therefore, implementation of Alternative 1 would not have a significant impact to socioeconomics.

<u>Environmental Justice</u>

No residential areas would be affected by Alternative 1, so no environmental justice impacts would be expected. There was some potential for the low-income population residing at Shelter Island to be impacted by construction noise, but analysis shows that construction noise would not be audible from that distance. There would be no disproportionately high environmental or health impacts on low-income or minority populations Therefore, implementation of Alternative 1 would not have a significant impact with respect to environmental justice.

3.11.3.3 Alternative 2 Delayed Dredging Alternative

Socioeconomic and environmental justice impacts would be the same under Alternative 2 as described under Alternative 1. Therefore, implementation of Alternative 2 would not have a significant impact with respect to socioeconomics and environmental justice.

3.11.3.4 Mitigation Measures

Implementation of Alternative 1 or Alternative 2 would not have significant socioeconomics and environmental justice impacts; therefore, no mitigation measures are proposed.

3.11.3.5 No-Action Alternative

Under the No-Action Alternative, temporary relocation of the Navy MMP, temporary relocation of the Everingham Bait Brothers Company bait barges, demolition and replacement of the existing fuel pier, and associated dredging of the high spot in the turning basin would not occur. Socioeconomic and environmental justice conditions would remain unchanged. Therefore, implementation of the No-Action Alternative would not have a significant impact with respect to socioeconomics and environmental justice.

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CHAPTER 4
CUMULATIVE IMPACT ANALYSIS

Federal regulations implementing National Environmental Policy Act (NEPA) (42 United States Code [USC] 4321 *et seq.*) and California regulations for Implementing NEPA (32 Code of California Regulations [CFR] 775), as described in Chief of Naval Operations Instruction (OPNAVINST) 5090.1C, require that the cumulative impacts of a Proposed Action be assessed. Council on Environmental Quality (CEQ) regulations implementing the procedural provisions of NEPA define cumulative impacts as:

> The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR 1507).

To analyze cumulative impacts, the following must be considered:

1) The area in which the effects of the proposed project will be felt;
2) The impacts that are expected in the area from the proposed project;
3) Other actions past, present, and reasonably foreseeable that have had or are expected to have impacts in the same area;
4) The impacts or expected impacts from these other actions; and
5) The overall impact that can be expected if the individual impacts are allowed to accumulate.

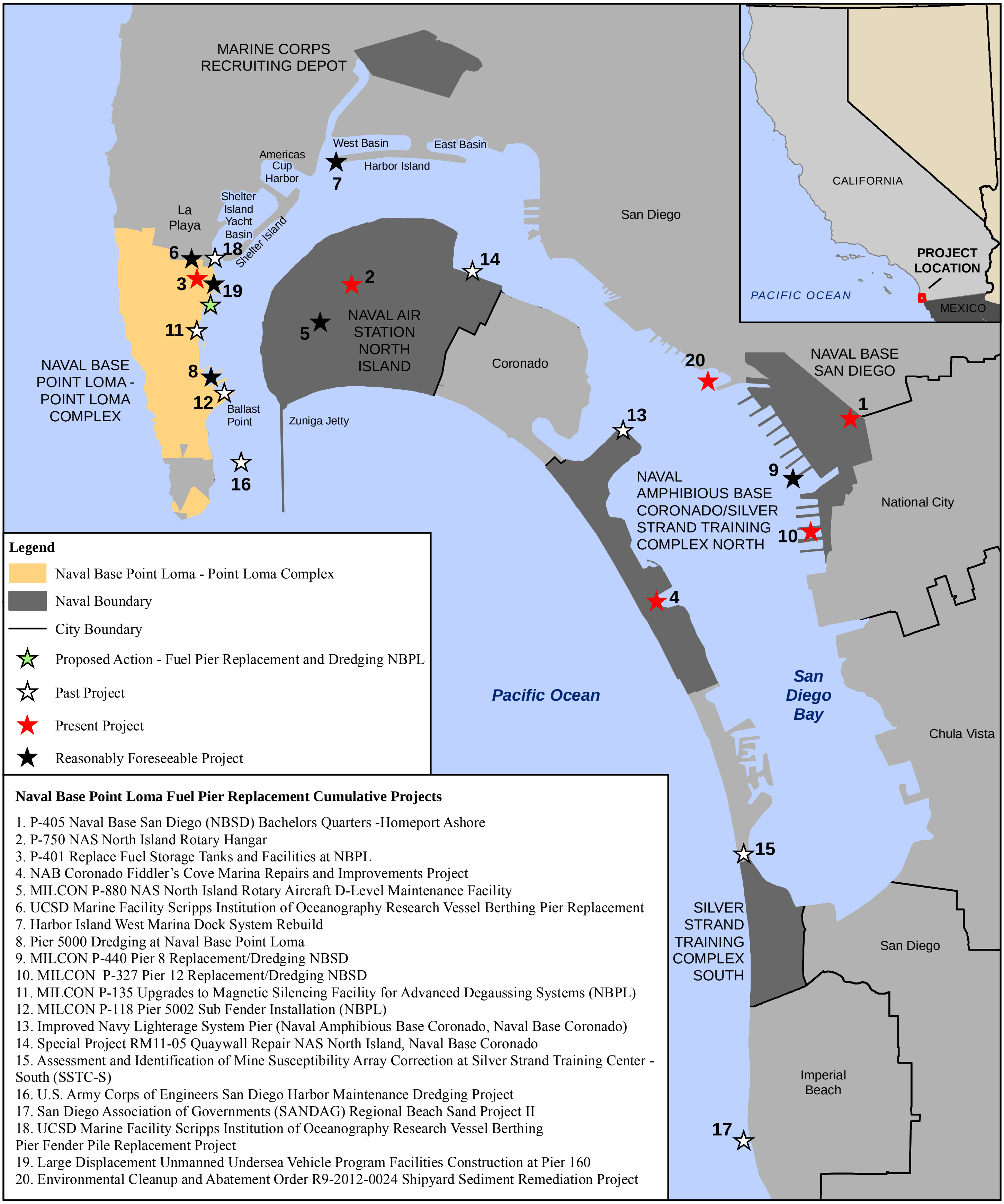
Consequently, the region where cumulative impacts may occur includes Naval Base Point Loma (NBPL) in the San Diego Bay, and the surrounding area (e.g., Naval Base San Diego [NBSD]) as illustrated in Figure 4.1-1. The cumulative projects described in Section 4.1 focus on other military projects and a civilian project adjacent to NBPL planned within San Diego Bay. The analysis presented in Section 4.2 considers additional impacts arising from the impacts of implementing Alternative 1 or Alternative 2 combined with the impacts of the other known past, present, and reasonably foreseeable future actions within this region. Figure 4.1-2 shows the estimated construction period timeframe for present and reasonably foreseeable projects and the Proposed Action and illustrates the temporal overlap of the cumulative projects and the Proposed Action.

4.1 PAST, PRESENT, AND REASONABLY FORESEEABLE PROJECTS

4.1.1 Past Projects

4.1.1.1 Upgrades to Magnetic Silencing Facility for Advanced Degaussing Systems Military Construction (MILCON) P-135 (NBPL)

MILCON Project P-135 upgraded the Magnetic Silencing Facility at NBPL so that it could support newer class Pacific Fleet surface ships. Upgrades occurred at pre-existing piers and associated underwater grids, vessel mooring system, Anti-terrorism/Force Protection floating barriers, and power supply systems (which required the installation of a new onshore electrical cable distribution system and onshore building demolition, repair, and construction).



Naval Base Point Loma Fuel Pier Replacement Cumulative Projects

1. P-405 Naval Base San Diego (NBSD) Bachelors Quarters -Homeport Ashore
2. P-750 NAS North Island Rotary Hangar
3. P-401 Replace Fuel Storage Tanks and Facilities at NBPL
4. NAB Coronado Fiddler's Cove Marina Repairs and Improvements Project
5. MILCON P-880 NAS North Island Rotary Aircraft D-Level Maintenance Facility
6. UCSD Marine Facility Scripps Institution of Oceanography Research Vessel Berthing Pier Replacement
7. Harbor Island West Marina Dock System Rebuild
8. Pier 5000 Dredging at Naval Base Point Loma
9. MILCON P-440 Pier 8 Replacement/Dredging NBSD
10. MILCON P-327 Pier 12 Replacement/Dredging NBSD
11. MILCON P-135 Upgrades to Magnetic Silencing Facility for Advanced Degaussing Systems (NBPL)
12. MILCON P-118 Pier 5002 Sub Fender Installation (NBPL)
13. Improved Navy Lighterage System Pier (Naval Amphibious Base Coronado, Naval Base Coronado)
14. Special Project RM11-05 Quaywall Repair NAS North Island, Naval Base Coronado
15. Assessment and Identification of Mine Susceptibility Array Correction at Silver Strand Training Center - South (SSTC-S)
16. U.S. Army Corps of Engineers San Diego Harbor Maintenance Dredging Project
17. San Diego Association of Governments (SANDAG) Regional Beach Sand Project II
18. UCSD Marine Facility Scripps Institution of Oceanography Research Vessel Berthing Pier Fender Pile Replacement Project
19. Large Displacement Unmanned Undersea Vehicle Program Facilities Construction at Pier 160
20. Environmental Cleanup and Abatement Order R9-2012-0024 Shipyard Sediment Remediation Project

Figure 4.1-1
Locations of Present and Reasonably Foreseeable Cumulative Projects

Source: Navy, NAVFAC Southwest, and Port of San Diego 2010

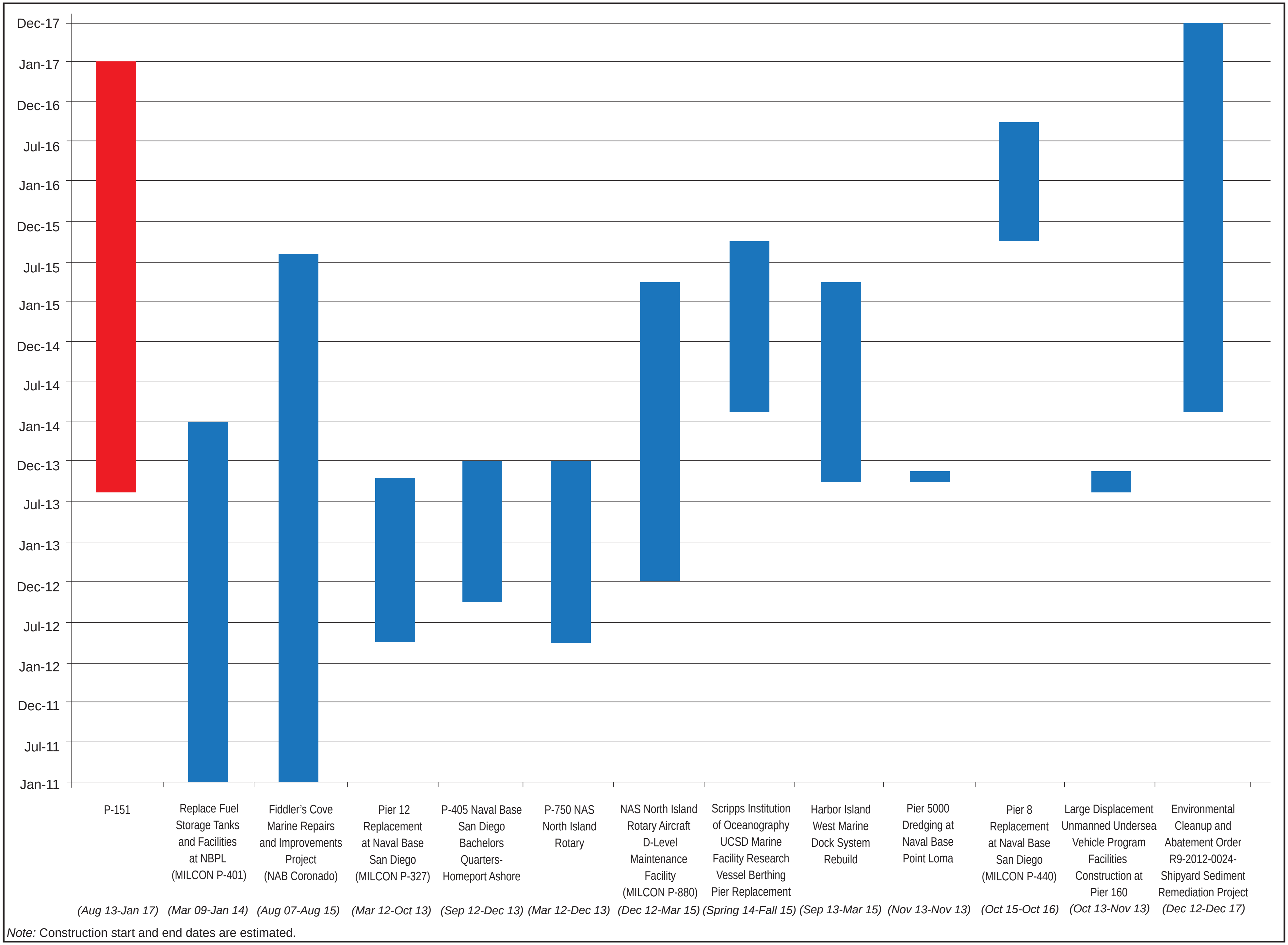


Figure 4.1-2
Comparison (overlap) of Estimated Construction Time Periods for Present and Reasonably Foreseeable Cumulative Projects to the Construction Time Period of the Proposed Action

As part of the project, the Navy marine mammals maintained by Explosive Ordnance Disposal (EOD) Mobile Unit 1 and their floating enclosures would be moved to Pier F122, where they could be located with other Navy marine mammals maintained by Space and Naval Warfare Systems Center (SSC) Pacific. A new access pier was constructed at Pier F122 for the co-located Navy marine mammal facilities. A Finding of No Significant Impact (FONSI) was signed for this project. Project activities were completed in 2010.

4.1.1.2 Pier 5002 Sub Fender Installation MILCON P-118 (NBPL)

MILCON Project P-118 modified Submarine Pier 5002, south of the P-135 project area, at NBPL. It allowed mooring of submarines next to the maintenance building. The principal modification was removal of deteriorating timber piles and replacement with composite piles with an expected life of 50 years. Supplemental foam-filled fenders were interspersed between the submarine fenders to accommodate surface ships. There was no increase in the pier footprint and no dredging was done. New power supply booms routing shore power to moored submarines and extra communications lines were installed. A Categorical Exclusion (CATEX) was signed for the project. The project occurred in 2008.

4.1.1.3 Improved Navy Lighterage System Pier (Naval Amphibious Base [NAB] Coronado, Naval Base Coronado [NBC])

The Improved Navy Lighterage System project involved construction of waterfront command and control facilities for amphibious operations and training at NAB Coronado. The project consisted of an Improved Navy Lighterage System lift/launch pier facility, including new pier construction and upgrades to pre-existing Piers 16, 18, and 19; road upgrades; increased storage yard space in conjunction with adequate maintenance and operational storage facilities; and quay wall repairs. A FONSI was signed for the project. Construction was completed in 2008.

4.1.1.4 Quay Wall Repair (Special Project RM11-05) Naval Air Station (NAS) North Island, NBC

Special Project RM11-05 involved both in-water and land based construction to repair the deteriorated portions of the quay wall along Berths “L” through “P” at NAS North Island. The quay wall became distressed because of scouring at the base, which compromised its structural integrity. Repairs were needed to prevent structural failure of the quay wall and to provide for its continued functionality in support of the Navy's operational and support mission. Project components included: (1) dredging and disposal of 49,000 cubic yards (cy) of bay sediment; (2) placement of rock armoring layers on the base of the sheet piling along the entire length of the quay wall (3,200 feet [ft]); (3) demolition and replacement of a portion (150 linear ft [lf]) of the damaged quay wall cap; (4) replacement of 150 lf of damaged steam line; (5) filling voids behind the quay wall; and (6) installation of new fendering at the location of the quay wall repairs. A FONSI was signed for the project. Construction was completed in 2008.

4.1.1.5 Assessment and Identification of Mine Susceptibility Array Correction at Silver Strand Training Complex - South (SSTC-S)

This project consists of the placement of a stone-filled concrete caisson structure around the existing eight piles of the Assessment and Identification of Mine Susceptibility Array at SSTC-S.

The existing facility is 1 mile (mi) offshore in 50 ft of water. The concrete caisson "stiffened" the structure, limiting its wave force deflection, and improving its performance. The project included the creation of fish habitat through the placement of A-jacks structures. A CATEX was signed for this project in December 2010. Construction began in March 2011 and was completed in November 2011.

4.1.1.6 U.S. Army Corps of Engineers (USACE) San Diego Harbor Maintenance Dredging Project

This project includes the removal of up to 550,000 cy of beach compatible material from the entrance to the federal channel, and discharge of dredged material for beneficial reuse in the nearshore zone at Imperial Beach and Coronado Beach. The project is required to maintain Federally authorized channel configurations, and to restore and ensure safe navigation within the harbor. The Final Supplemental Environmental Assessment (EA) (USACE 2012) prepared for this project concluded that there would be no significant impact to any resource area, and a FONSI was signed on 12 June 2012 (USACE 2012). Maintenance dredging began in November 2012 and was completed in December 2012.

4.1.1.7 San Diego Association of Governments (SANDAG) Regional Beach Sand Project II

The project restored beaches in the San Diego region, because water supply and flood control projects reduce the natural flow of water and sand to the coast (SANDAG 2012). The project replenished 1.4 million cy of clean beach-quality sand at up to 11 receiver sites in the San Diego region, including Imperial Beach (SANDAG 2012). Sand was dredged from up to three offshore borrow sites and placed on shore. An Environmental Impact Report was certified for this project in May 2011. Work took place from August through October 2012 (SANDAG 2012). Equipment set-up for this project included assembling and anchoring 3,000 ft sections of 30-inch (in) diameter dredge pipe in the waters south of Harbor Island for approximately 1 week in August 2012. Work at Imperial Beach included dredging sand from a borrow site offshore, transporting the dredge sediment to a pump-out location located approximately 6,000 ft from shore, and pumping the sand to the onshore placement site via an underwater pipeline. This work began in September 2012 and was completed in December 2012.

4.1.1.8 Scripps Institution of Oceanography (SIO)/ University of California San Diego (UCSD) Pier Fender Pile Replacement Project

This project replaced 12 concrete and wood fender piles at the existing SIO UCSD Nimitz Marine Facility Research Vessel Berthing Pier and associated wharf on NBPL and UCSD lands adjacent to the north of NBPL (Figure 2-5). The 12 fender piles identified for replacement have failed or are missing completely, thus the work was urgently needed, i.e., ahead of the replacement of the entire pier and wharf facility as described below in Section 4.1.3.1. At seven designated locations on the pier (Navy lands) and five locations on the wharf (UCSD lands), broken piles or visible pile stubs were removed or cut at the mudline. The fender piles were replaced in-kind with 14-in square concrete fender piles installed using jetting and an impact hammer. The proposed fender pile replacement did expand the existing pier footprint or change its use. Construction for this project began on 5 November 2012 and ended on 13

November 2012. The total construction time was less than 2 weeks. UCSD-SIO coordinated all pile-driving activities with SSC Pacific such that the Navy's marine mammals could be observed during construction. If any unexpected adverse effects were observed, SSC Pacific was prepared to take preventive actions such as moving disturbed individuals.

4.1.2 Present Projects

4.1.2.1 P-405 NBSD Bachelors Quarters - Homeport Ashore

This project would construct a 162,040 square ft (sf) bachelor enlisted quarters to house 772 E1-E4 personnel. Additionally, a seven level parking structure of 284,167 sf will be constructed. The project location is dry side NBSD (next to the bowling alley). A CATEX has been completed for the project. Construction began in September 2012 and is estimated to be completed in December 2013.

4.1.2.2 P-750 NAS North Island Rotary Hangar

The project will provide a helicopter maintenance facility and an aircraft parking apron to bed-down three helicopter squadrons being assigned to NAS North Island. The project will consist of a multi-story, steel framed, three-bay maintenance hangar at the current site of Building 802. The hangar will have a concrete foundation, concrete first and second floors, interior partitions, steel roof deck, masonry walls, and a pile foundation. The project includes electrical and mechanical utilities, power check pad, engine wash pad, compressed air, secure communications connections, aircraft parking apron, and roadway. Built-in equipment would include an elevator, back-up generators, and a closed-loop wash rack system. Special construction features would include sound attenuation for administration and shop space and an aqueous film-forming foam fire protection system. The project will also upgrade electrical power for the new MH-60S/R helicopters by installing a 1,500 kilovolt-ampere transformer and secondary switchboard and construct a 12 kilovolt duct bank with conductors, manholes, and switch. A 5-ton crane will be provided from other appropriations. The project will conform to anti-terrorism/force protection standards and follow sustainable development criteria for design, development, and construction of the project. P-750's NEPA is included in the MH60 Homebasing EA, which was completed in 2011. Construction began in March 2012 and is estimated to be completed in December 2013.

4.1.2.3 Replace Fuel Storage Tanks and Facilities at NBPL (MILCON P-401)

This project consists of modernizing the existing Defense Fuel Support Point (DFSP) Point Loma fuel storage and distribution facility. All existing bulk fuel storage tanks, both above and underground (and their associated pipelines and pumping facilities) are being demolished or closed in place. Eight new multi-product, aboveground bulk fuel storage tanks are being constructed to provide a total fuel storage capacity of 42 million gallons. New pumping facilities and transfer pipelines are also being constructed, as well as new access roads within DFSP Point Loma and new sedimentation basins for stormwater management. The construction plan is divided into two phases: construction activities followed by the in-place closure of underground storage tanks (USTs). While construction is ongoing, fueling operations will continue from USTs that will be decommissioned when the new tanks are functional. No significant impacts to any resource area were identified in the EA prepared for this project. Work on the P-401 project began in March 2009 and is expected to be completed in January 2014.

4.1.2.4 Fiddler's Cove Marina Repairs and Improvements Project (NAB Coronado, NBC)

The purpose of the Fiddler's Cove Marina Repairs and Improvements Project is to provide a functional multi-use, year-round recreational facility in San Diego County to support the military's regional recreational needs. The project is restoring serviceability of deteriorated marina facilities at the existing Fiddler's Cove Marina, NAB Coronado, NBC. This project includes restoration of deteriorated marina facilities including slips and docks at Fiddler's Cove, replacement of the floating wave attenuation system, erosion control and shoreline stabilization, and enhancement/expansion of existing recreational functions of the marina. A FONSI was signed for the project. The Fiddler's Cove Marina Repairs and Improvements Project began construction in August 2007 and is expected to be completed in August 2015.

4.1.2.5 NAS North Island Rotary Aircraft D-Level Maintenance Facility MILCON P-880

This project would construct a depot-level rotary aircraft maintenance facility at NAS North Island. A new high-bay facility is required to support the current depot-level H-60 helicopter maintenance, repair, and overhaul program workload and to accommodate scheduled workload increases due to the arrival of three additional H-60 squadrons. The facility would house maintenance shops, administration offices, parts storage spaces, break room/lunch room, restrooms, showers, and locker rooms. The building space would consist of aircraft rework shop space (high bay), plant services for aircraft overhaul (administration and production control), and maintenance aircraft storage space. The project would also demolish 10 existing facilities. Sustainable design principles would be included in the design and construction of the projects in accordance with Executive Order (EO) 13123 and other laws and EOs. Facilities would meet Leadership in Energy and Environmental Design green building certification ratings and comply with the Energy Policy Act of 2005. Low Impact Development would be included in the design and construction of this project. A CATEX was signed for this project; construction began in December 2012 and is estimated to be completed in March 2015.

4.1.2.6 Pier 12 Replacement and Dredging NBSD MILCON P-327

This project would involve demolition of an inadequate existing pier (Pier 12) at NBSD, dredging in berthing and approach areas for the new single-deck pier, dredged material disposal at an approved ocean disposal site and permitted landfill, construction of a new general purpose berthing pier and associated pier utilities, including upgrades to the electrical utilities at adjacent Pier 13, and construction of fish enhancement structures (artificial habitat for fish) using concrete debris from pier demolition. An EA has been completed for this project and a FONSI was signed. Demolition and dredging for this project began in March 2012. Construction is estimated to be completed October 2013.

4.1.2.7 Environmental Cleanup and Abatement Order R9-2012-0024-Shipyard Sediment Remediation Project

The environmental cleanup and abatement order R9-2012-0024 was issued by the San Diego RWQCB. The shipyard sediment remediation project involves the dredging of the sediment adjacent to shipyards in San Diego Bay, the dewatering and solidification of the dredged material (onshore or on a barge), the potential treatment of decanted water (anticipated disposal to the sanitary sewer), and the transport of the removed material to an appropriate landfill for disposal. A total volume of 52,600 cy of sediments would be dredged, dewatered, and land disposed. The sediment remediation project is centered on an area adjacent to the NASSCO and BAE shipyards located along the eastern shore of San Diego Bay, extending approximately from the Sampson Street Extension on the northwest to Chollas Creek on the southeast, and from the shoreline out the San Diego Bay shipping channel to the west. An Environmental Impact Report was prepared for this project. The project commenced in December 2012 and is expected to take 5 years to complete.

4.1.3 Reasonably Foreseeable Projects

4.1.3.1 SIO UCSD Marine Facility Research Vessel Berthing Pier Replacement

This project would replace the existing SIO (UCSD) Nimitz Marine Facility Research Vessel Berthing Pier and associated wharf on NBPL and UCSD lands adjacent to the north of NBPL (Figure 2-5). The existing pier and wharf that were originally constructed in 1965 replaced and expanded in 1973, would be demolished. A new, modern replacement pier and wharf of the same size and configuration would be constructed with upgrades including: cold-iron berthing for ships in port; improved lighting for nighttime operations; fiber optic lines for telecommunications and data transfer; and modern systems for potable water, management of oily water, waste oil, sanitary sewage, and stormwater. The Scripps Pier project would install 137 24-in diameter concrete piles over the course of a 20-month construction period. In-water work for this proposed project would also be scheduled to coincide with the temporary relocation of the Navy's Marine Mammal Program (MMP) that is planned for the proposed P-151 fuel pier replacement project. Dredging would not be required for the Scripps Pier project but design would allow for future dredging and expansion. The slope under the Scripps Pier wharf and landward would be stabilized with cement deep soil mixing. All concrete and steel debris would be recycled; treated wood waste wood be disposed at an appropriately permitted facility. An EA for the project is in process. Construction for this project is estimated to begin in the spring of 2014, and be completed in the fall/winter of 2015.

4.1.3.2 Harbor Island West Marina Dock System Rebuild

Harbor Island West Marina is a privately owned facility located across San Diego Bay to the east of the Naval Mine and Anti-Submarine Warfare Command (NMAWC) that accommodates recreational vessels ranging from 25 to over 55 ft long. This project would rebuild the existing docks at Harbor Island Marina and is anticipated take approximately 3 to 4 years to complete. The estimated project start date is approximately October 2013, so that in-water construction may take place outside the least tern breeding season. The project would likely occur in phases that would occur over 18 months. As of the period of this EA, project environmental and permitting work was not initiated. Harbor Island West Marina is in contact with the Unified Port of San Diego (San Diego Port Authority), which will be the California Environmental Quality Act (CEQA) lead agency, to determine what CEQA and permitting requirements apply. An engineering firm is under contract to develop the early design and cost estimate. The numbers and sizes of structural piles that would be required at Harbor Island West Marina are unknown within the timeframe of this EA. However, it is anticipated that jetting would be used to install the new piles, which could potentially be of concern to the Navy MMP. Construction for this project is estimated to begin in September 2013 and end in March 2015.

4.1.3.3 Pier 5000 Dredging at Naval Base Point Loma

This project involves dredging sediment at NBPL Pier 5000 (located at Submarine Base NBPL about 0.4 mile south of the fuel pier) and offsite sediment disposal. The proposed dredge footprint is adjacent to the north side of Pier 5000, starting approximately 800 ft from the shoreline and extending to the end of the pier. Dredging would most likely involve a barge-mounted clamshell or backhoe dredge. The NBPL Pier 5000 Dredging project is for approximately 6,380 cy of sediment. The proposed Pier 5000 Dredging project is small when taken in comparison with other typical area dredging projects. Depending upon the dredging method used the dredging operation may be complete in a few as three days. Therefore, while any dredging at the NBPL Pier 5000 site can be considered relatively intense when considered in combination with P151, its very short duration and very small size makes it relatively insignificant. There is also consideration of rescheduling the project to Fiscal Year (FY) 16. The project includes two options for sediment disposal: nearshore replenishment (beneficial reuse) or ocean disposal. Sediment disposal for this project would adhere to the Marine Protection, Research, and Sanctuaries Act of 1972; the Clean Water Act (CWA) Sections 404 and 401; and Rivers and Harbors Act (RHA) Section 10 Regulatory Programs. A Draft EA for this project was completed in October 2012. Construction for this project is estimated to begin and be completed in November 2013.

4.1.3.4 Pier 8 Replacement MILCON P-440 (NBSD)

MILCON P-440 would demolish the inadequate existing Pier 8 at NBSD and construct a replacement general purpose berthing pier. The new, single deck pier would fulfill berthing needs for modern ships in the U.S. Pacific Fleet. Pier design would include pre-stressed concrete piles supporting a concrete deck and support a future upgrade of shore-to-ship power to meet power intensive ship requirements. A stormwater collection system with an oil/water separator would be included. No dredging would be required because Pier 8 is already a deep draft pier. The EA for this project is ongoing. Construction for this project is estimated to begin in October 2015 and be completed in October 2016.

4.1.3.5 Large Displacement Unmanned Undersea Vehicle (LDUUV) Program Facilities Construction at Pier 160

SSC Pacific proposes to make improvements in the Bayside area to accommodate the LDUUV Program. Primary improvements are to construct up to five boat lifts at Pier 160, construct two concrete tracks for a launch and recovery area, and install a compressed gas recharging station on Pier 160. In addition, Building 9 would be repaired and modified and the flume bridge located on Front Street would be modified. All work would be conducted within the bayside area of NBPL. Facility improvements are required to enable launch, recovery, and recharging of the LDUUV at the pier, out-of-water mooring for the LDUUV and accompanying small boats, and maintenance of the LDUUV inside a building. The level of NEPA documentation to be prepared for this action is anticipated to be an EA but has not been finalized at this time. The 1-month construction period for this project is estimated to begin in October 2013.

4.2 APPROACH TO CUMULATIVE IMPACTS ANALYSIS

4.2.1 Context and Intensity

Analysis of cumulative impacts is an important aspect of the impacts analysis undertaken by an EA. Per the CEQ regulations: 40 CFR 1508.7 Cumulative impact. "Cumulative impact" is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over time.

The goal of the cumulative impacts section is the same as the goal of analysis for individual direct and indirect impacts. It is to furnish the decision makers with sufficient information to judge whether the proposed action "significantly affects the human environment" within the meaning of NEPA and the authorities that interpret it. Therefore, the term "significantly" referenced herein is as defined by the CEQ regulations (40 CFR 1508.27)

Per the CEQ regulations, "significantly" for an impact is a matter of "context" and "intensity" of that impact. Context varies with the scale and nature of the action. In our case, San Diego Bay represents a major aspect of context. The Bay is the discrete, coherent ecosystem where the project occurs. The bay has its own unique habitats and species, and a shared history of similar types of man-made impacts. It is also somewhat isolated and set apart as an area of recreational and industrial use, surrounded by residential and urban uses. Some particular impacts such as impacts to traffic, or air, have much smaller, or much wider contexts of potential impact. Traffic impacts occur only on the impacted roadways. At the same time, air quality is a matter of air basins and regional concerns.

"Intensity" is a matter of the amount: level, magnitude, volume, or quantity of impact. Generally the question is whether the intensity rises to a significant level with regard to the partial list of environmental considerations listed 40 CFR 1508.27(b) or to other relevant considerations or aspects of the "human environment."

4.2.2 Acute Impacts and Lingering Impacts

The first distinction to make with regard to a particular impact is the question of whether it is transitory or "acute" or it is a lingering effect. Because an acute impact is temporary, it goes away. Therefore for its impacts to be additive, they must go on at the same time in whole or part. This is defined as temporal overlap. In addition, the impacts have to take place in sufficient geographic proximity that one can potentially add to another. The less intense an impact is, the closer it has to be to the proposed project to be close enough in proximity to contribute to a cumulative impact. Or viewed another way, unless a cumulative impact is close enough and intense enough to reasonably have the potential to significantly align with, magnify, or exacerbate environmental impacts of a Proposed Action (P-151 in this case), it is irrelevant. It is often relevant to use quantitative and/or modeling analysis to analyze acute effects. It is important where and when each cumulative action takes place. The environmental resources that fall under the acute impact category include: airborne noise; underwater noise; land-based traffic; and water quality as related to turbidity.

To summarize, there are three major factors in determining whether a cumulative project warrants a quantitative **or modeling** approach to determine how it adds to a proposed project's impact. These are:

1) Temporal Overlap. If there is no overlap in time, purely acute effects do not add to the proposed project, so they need not be quantified.
2) Geographic Proximity. An acute impact cannot be additive if it is too far away.
3) Intensity. Intensity modifies the relevance of geographic proximity. The more intense the impact, the farther away it can be measured.

Lingering effects must be looked at differently in an environment like San Diego Bay or any urban area. Examples of lingering impacts include habitat destruction, and air emissions of criteria pollutants and precursors. It is not practical in general to measure lingering effects with regard to particular past, present, or reasonably foreseeable future projects, because there have been thousands of projects altering the bay over many years. The air quality is impacted by many diverse factors and millions of mobile and stationary sources all over the San Diego Air Basin (SDAB) and beyond. It becomes futile to try to list and quantify impacts of individual actions. This forces us to look at current impacted baseline conditions and current trends for the future and to derive or develop means of assessing significant impacts for various lingering effects. The resources that fall under the lingering impact category include air quality and biological resources-habitats and communities.

It should be noted that hazardous materials are handled by each individual industrial facility around the bay. Each facility is individually permitted and held responsible for such materials and wastes, such that they do not release such materials and wastes into the environment. These materials and wastes are contained. Therefore, these materials and wastes do not add to each other in the environment, unless they are mishandled. To anticipate varying scenarios where multiple facilities mishandle materials and wastes is just speculation. Contrast this with sources of impacts to other kinds of resources. Air emissions are released into the air, permitted or not, and mingle with other air emissions. Sources of in-water noise affect the environment while the noise is occurring. While regulatory compliance is a factor in determining significance of air quality and underwater noise impacts, the sources of impacts are still out there causing potential harm.

There are comprehensive regulatory systems now in place that did not exist when NEPA was first enacted. These regulatory systems are based on the current environmental baselines, reflecting past and present impacts, together with future trends and environmentally protective goals. Compliance or non-compliance with applicable environmental laws is therefore relevant to the term "significantly (see also 40 CFR 1508.27(b)(10)." Environmental regulation also offers a source of standards and thresholds that reflect environmental baseline conditions and future trends and goals. As a practical matter concerning air quality, this means that the screening criteria for "significance" were derived by adapting regulatory thresholds determined by the United States Environmental Protection Agency (USEPA). These are thresholds that become smaller and more stringent as the level of "nonattainment" of air quality standards in a given air basin becomes more serious. This methodology makes primary or direct impact air quality analysis inseparable from cumulative air quality analysis. They are the same because screening standards reflect the past, present, and foreseeable future impacts and regulatory goals.

In addition to the laws and regulations, there are studies such as the San Diego Bay Integrated Natural Resources Management Plan (INRMP) that also help with analyzing cumulative impacts. These studies document historical conditions leading up to the current baseline that reflects the cumulative impact of past actions. They also document future trends and goals, so that the significance of a project's impacts can be judged in light of those trends and goals. This becomes another example, where the primary or direct impact analysis cannot be separated from the cumulative impact analysis. There is no other meaningful way to determine significance of impact – primary, secondary, or cumulative – than to look at it in the context of the current baseline condition of the bay in light of future trends and goals.

The foregoing should not be taken to say that enumeration and quantification of impacts of individual cumulative projects is never appropriate for analyzing lingering impacts in an urban environment. It is possible that an individual future project could completely alter the baseline such that it should be individually considered. No such projects are presently reasonably foreseeable, in the project area.

It should also be noted that an impact may be both acute and lingering. In-water noise is an example, where the impact of the noise disappears completely after the noise is gone. However, noise can contribute to a lingering impact, by "take" of a protected animal. This is particularly true if mitigation such as gradual ramp up in pile driving is not used.

4.2.3 Quantitative Analysis for Cumulative Impacts

The first step in the process of considering which of these projects require quantitative analysis for acute impacts involved identifying the projects around the bay where there is a reasonable probability of temporal or project time overlap with the Proposed Action (P-151). The estimated start and end date for construction of the various projects is illustrated on Figure 4.1-2. The next factor is proximity – how close geographically are the projects to the location of P-151. Past, present, and reasonably foreseeable projects throughout San Diego Bay are illustrated on Figure 4.1-1. The third factor is intensity or magnitude of the relevant acute impacts. To warrant quantitative treatment, an impact must at least have some discreet, measurable impacts at the site of P-151, and have at least some potential to significantly align with, magnify, or exacerbate P-151 environmental impacts.

Applying the above factors resulted in the selection of two nearby, concurrent projects for quantitative analysis:

- MILCON P-401 - Replace Fuel Storage Tanks and Facilities at NBPL
- SIO UCSD Marine Facility Research Vessel Berthing Pier Replacement

The estimated period of construction timeframes for P-401 and the Scripps Pier project partially overlap the estimated period of construction timeframe for P-151 (i.e., temporal), they are geographically located in the vicinity of P-151 (i.e., proximity), and some of the same resource areas would be affected (i.e., resource intensity). The remaining projects near the P-151 project area were not selected to be analyzed quantitatively because their timing, location, and expected resource impact intensity does not indicate a potential, in combination with P-151, to jointly cause significant environmental impacts.

The screening process also resulted in the consideration of two more distant projects in the Bay for quantitative analysis:

- MILCON P-327 - Pier 12 Replacement at NBSD
- MILCON P-440 - Pier 8 Replacement at NBSD

Although the estimated period of construction timeframes of P-327 and P-440 do not overlap, the estimated period of construction timeframes for projects P-327 and P-440 partially overlap the estimated period of construction timeframe for P-151. Although these projects are not in proximity, some of their acute impacts, such as water turbidity from dredging are relatively great (or intense) because they are sizable projects. Their intensity as to these impacts makes them worthy of closer look although they are not in close proximity to P-151. Based on this closer look, it was determined that the dredging associated with the P-327 project (and the P-327 project in total) would be completed before the P-151 dredging commences; therefore, there is no overlap or additive effect. Regarding underwater noise, although the P-440 project and P-151 project would overlap in time, the underwater noise from the P-151 project would not intersect or combine with the P-440 underwater noise due to the distance between these projects. The remaining cumulative projects throughout San Diego Bay were not selected to be analyzed quantitatively because their timing, location, and expected resource impact intensity would not significantly align with, magnify, or exacerbate P-151 environmental impacts.

4.3 CUMULATIVE IMPACTS ANALYSIS

This section addresses the additive effects of Alternative 1 and Alternative 2 evaluated in this EA in combination with the relevant actions described above in Section 4.1.

4.3.1 Habitats and Communities

As noted above under approach to analysis, the suite of biological resources falls under the lingering impact category.

With implementation of Alternative 1 or Alterative 2, the effects on habitats and communities would largely consist of temporary underwater noise and sediment disturbance to open water and benthic communities during construction and demolition. The Scripps Pier replacement project, which does not include dredging that would contribute to turbidity, would overlap in time with the Proposed Action and would add incrementally by a small amount to areas of marine water column and benthic habitat affected by the Proposed Action (noise is discussed in Section 4.2.2). However, the combined impacts would still be small in the context of the bay, temporary, and not significant in a cumulative sense.

Net long-term changes associated with the replacement of the existing pier by a slightly smaller pier and the deepening of the turning basin would be minor in the context of bay habitats, and not significant. Any permanent effects on eelgrass beds would be mitigated by use of the Navy's established eelgrass mitigation bank, which has proven to effectively replace eelgrass functions and values that are impacted by Navy projects. Therefore, neither Alternative 1, nor Alternative 2, in conjunction with other projects listed in Section 4.1, would result in significant cumulative impacts to habitats and communities.

4.3.2 Fish

As noted above under approach to analysis, underwater noise falls under the acute impact category. With implementation of Alternative 1 or Alternative 2, the effects on fisheries, including Essential Fish Habitat (EFH), would largely consist of temporary underwater noise and sediment disturbance during construction and demolition. Mortality to fish is unlikely because potential Zones of Influence (ZOIs) for fish injury are confined to the immediate area around the pile being driven, and fish would most likely move away during the ramp-up procedure. Otherwise, the dispersal of fish away from especially loud underwater sound, or other behavioral reactions may occur, but these effects would be localized and not significant. The Scripps Pier replacement project would overlap in time with the Proposed Action and would add incrementally by a small amount to the cumulative disturbance of marine water column and benthic habitats used by fish.

The potential combined effects of pile driving noise from the Proposed Action and the Scripps Pier replacement project were modeled by Dr. Peter Dahl of the University of Washington using methods essentially similar to those used to model transmission loss for the Proposed Action (Appendix E.4), but with the sound levels from the two projects additive. The modeled scenario, a simultaneous pile strike, is shown in Figure 4.3-1. Because the sound level for the Scripps Pier replacement pile driver is much less than that of the impact pile driver for the steel piles needed for the replacement fuel pier, the Scripps Pier replacement project would not add significantly to the sound caused by the Proposed Action. The area where the two projects could have an additive effect in terms of disturbance is limited to the vicinity of the Scripps pier, where the received sound levels from the two projects could be approximately equal, adding to the disturbance of fish in that area. The combined impacts would still be small in the context of the bay, temporary, and not significant in a cumulative sense.

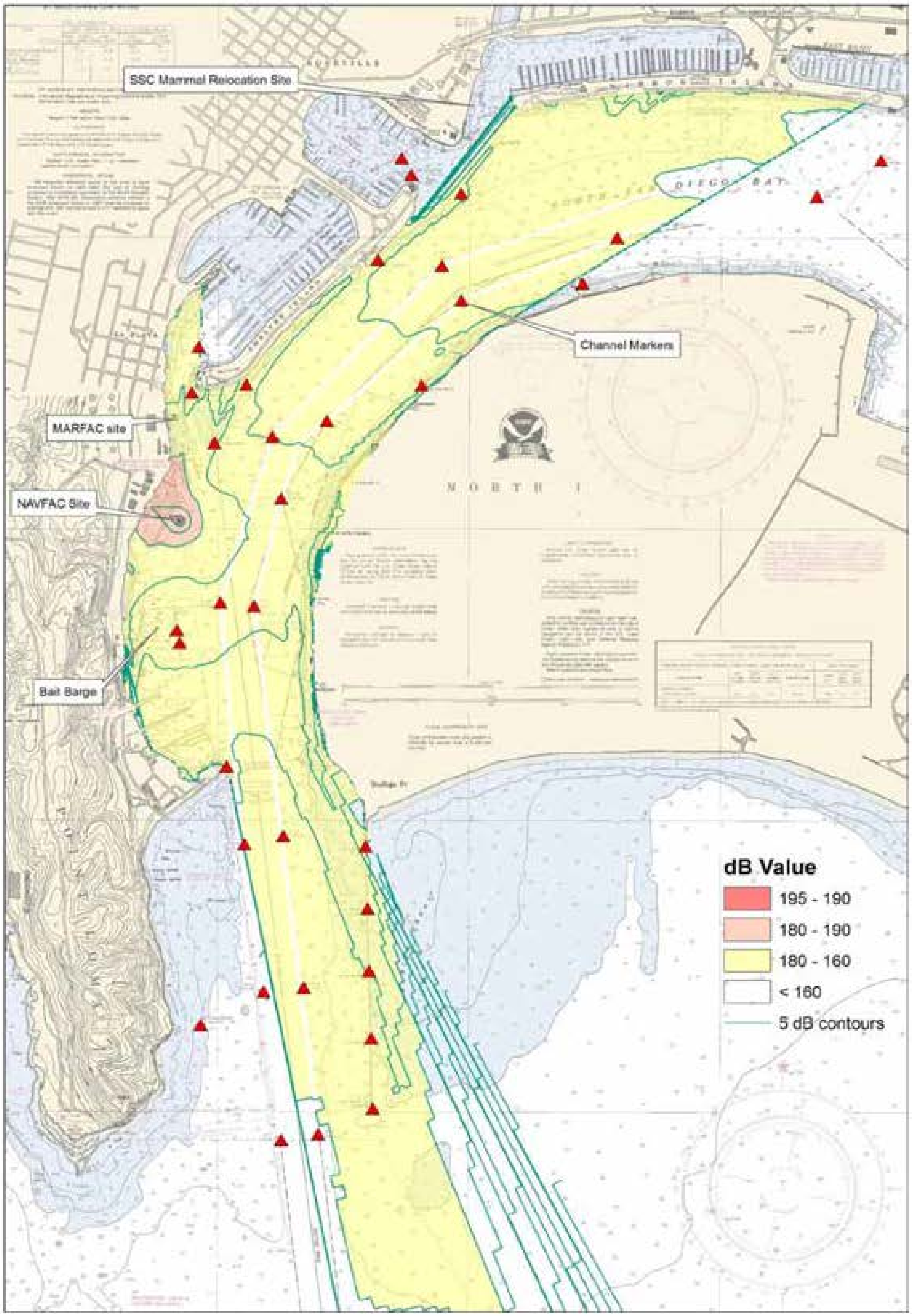


Figure 4.3-1 Combined Underwater Construction Sound Contours for the Proposed Naval Base Point Loma Fuel Pier Replacement (195 dB) and the Scripps Marine Facility Replacement Pier (175 dB)

P-151 would have no temporal overlap with P-327 (Pier 12 Replacement), but would overlap with P-440 (Pier 8 Replacement) at NBSD. As discussed in Sections 3.2.3 and 3.4.3, and shown for example in Figure 3.2-2, the maximum potential for underwater noise disturbance to marine mammals or fish from P-151 would not extend past Harbor Island, which is 5 mi (8 kilometers [km]) from the P-440 project site. P-440 construction involves installing concrete piles, which would have potential ZOIs of small spatial extent, similar to what is depicted in Figures 3.2-3 and 3.2-5, with very minor, temporary effects on fish. P-440 demolition may involve the use of vibratory extraction for non-steel piles, which would have a potential ZOI for marine mammals similar to that of Figure 3.2-7, extending up to 2-3 mi (4-5 km) from the P-440 site, but still several kilometers from the maximum ZOI of P-151. Marine mammals are uncommon in central San Diego Bay (Navy 2011) and are unlikely to move between the P-151 and P-440 project areas. For fish, the potential ZOI from vibratory extraction during P-440 would be limited to a small area around Pier 8 (see Table 3.2-4). This analysis indicates that there would be no overlap in the potential underwater noise effects of P-440 and P-151, and hence no potential for cumulative impacts.

4.3.3 Birds

With implementation of Alternative 1 or Alternative 2, the effects on birds would consist of direct as well as indirect effects of temporary noise and sediment disturbance during construction and demolition, as well as minor permanent changes in structural habitats which birds perch on and which may affect the distribution of forage fish. Birds are likely to avoid the immediate areas of construction and demolition due to loud, airborne noise. Fish would likely disperse away from these areas in response to underwater noise, but these effects are relatively small and localized in the context of the bay; similar structural and aquatic habitats are present throughout the northern and central parts of the bay. It is very unlikely that diving birds would remain underwater and in close proximity to pile driving for a sufficient time to incur injury. Pier replacement would result in a net reduction in covered bay surface and underwater structural habitat, with a corresponding increase in open water, but these changes are also minor in the context of the bay. Effects on eelgrass habitat would be minimized and mitigated as described above. Overall, localized effects on breeding and resting habitats would occur, but no effects on migratory bird populations are anticipated because of the Proposed Action.

The Scripps Pier replacement project would overlap in time with the Proposed Action and would add incrementally by a small amount to areas affected by airborne and underwater sound, and turbidity, but any combined impacts would still be small in the context of the bay and migratory bird populations. Therefore, neither Alternative 1, nor Alternative 2, in conjunction with other projects listed in Section 4.1, would result in significant cumulative impacts to birds.

4.3.4 Marine Mammals

As shown in Figure 4.2-2, the combined underwater acoustic effect of the Scripps Pier replacement project and the Proposed Action is very small, and the potential for additive disturbance to marine mammals would be limited to the immediate vicinity of the Scripps pier.

Given that marine mammals are likely to avoid the Scripps pier location during that project's pile driving, no significant cumulative impact would be anticipated.

Other Navy, as well as non-Navy projects, in the San Diego Bay region have the potential to affect individual marine mammals, but Marine Mammal Protection Act (MMPA) compliance by all projects assures that effects on stocks of marine mammals remain negligible under the MMPA. Consultation on many projects and the sharing of research and monitoring results between the Navy and National Marine Fisheries Service (NMFS) also contributes to a better understanding of the potential effects of anthropogenic sound and other stressors on individuals as well as populations. Therefore, neither Alternative 1, nor Alternative 2, in conjunction with other projects listed in Section 4.1, would result in significant cumulative impacts to marine mammals.

4.3.5 Threatened and Endangered Species

Federally listed threatened and endangered species that may occur in the areas affected by the Proposed Action include the California least tern and green sea turtle. Consistent with the Navy-U.S. Fish and Wildlife Service (USFWS) Memorandum of Understanding (MOU) (Appendix E.2), seasonal restrictions on underwater activities that could generate noise and turbidity would be implemented to avoid potential direct and indirect effects on least tern breeding habitat. The Scripps Pier replacement project would implement a similar seasonal restriction on pile driving. Navy monitoring would ensure that in the unlikely event that green sea turtles transit through a potential ZOI for acoustic effects, the activity would be stopped until the animal has departed. Hence for both species, the Navy has reached a conclusion of "may affect, not likely to adversely affect." For both of these species, ongoing programmatic consultations between the Navy and USFWS and NMFS ensure that Navy activities avoid and minimize potential effects. Therefore, neither Alternative 1, nor Alternative 2, in conjunction with other projects listed in Section 4.1, would result in significant cumulative impacts to threatened and endangered species.

4.3.6 Water Resources

With implementation of Alternative 1 or 2, acute impacts on water quality would be localized and short-term. During demolition, construction, and dredging, protective measures would be implemented to minimize impacts to marine water quality: retention of the existing sheet pile, the use of catch devices and sheeting, and the NBPL Emergency Response Action Plan. The selected contractor would implement Best Management Practices (BMPs) to meet USACE and San Diego RWQCB permit conditions. As described in Section 3.6.3.2, *Marine Water Quality-Sediment Quality*, the Navy conducted sediment sampling in the proposed fuel pier and NMAWC construction footprints (Naval Facilities Engineering Command [NAVFAC] Southwest 2013a). Analytical results of the sediment samples indicate that sediment disturbance during construction and demolition at the proposed sites would not have significant water quality impacts (NAVFAC Southwest 2013a). As described in Section 3.6.3.2, *Marine Water Quality-Turning Basin,* sediment samples were analyzed from the proposed dredge footprint and found unlikely to cause significant water quality impacts during dredging (NAVFAC Southwest 2011). Temporary relocation of the Navy MMP to NMAWC as proposed is not expected to result in additional exceedances of waters designated for contact recreation (REC-1) standards for indicator bacteria, fecal and total coliform, and is not anticipated to increase the likelihood of algal blooms or adverse nutrient loading conditions. However, if results of monitoring to be conducted during the temporary relocation period should indicate greater than anticipated impacts to water quality, adaptive management measures would be implemented to reduce impacts to below a level of significance. The Everingham Brothers Bait Company bait barges would not affect bathymetry or circulation at the selected temporary relocation site or discharge waste water. Demolition, construction, and dredging would not have significant impacts to bathymetry and circulation. Improved stormwater management capabilities for the proposed new fuel pier and the reuse of dredge sediments for nearshore replenishment are anticipated to be beneficial impacts.

As noted above in Section 4.2.2, *Acute Impacts and Lingering Impacts*, water quality as related to turbidity falls under the acute impact category. As stated above in Section 4.1.3 and shown on Figure 4.1-2, timing for the following projects is expected to coincide with the NBPL P-151 Fuel Pier Replacement Project: SIO (UCSD) Nimitz Marine Facility Research Vessel Berthing Pier project (2013-2014); MILCON P-327 - Pier 12 Replacement at NBSD (2013); and MILCON P-440 - Pier 8 Replacement at NBSD (2015 through 2016). There would be no temporal overlap of MILCONs P-327 and P-440 because construction for P-327 is estimated to end in 2013, 2 years before the estimated 2015 start date for P-440.

4.3.6.1 SIO (UCSD) Nimitz Marine Facility Research Vessel Berthing Pier (Overlap with Proposed Action 2013-2014)

The project would extract structural piles with cranes and possibly jetting methods (NAVFAC Southwest 2013b). Demolition is estimated to take 6 months. The 137 structural piles (24-in octagonal) for the wharf and pier would likely be installed with a diesel impact hammer. Concrete piles would likely be jetted into place for a portion of the length and then driven to the final tip elevation using the impact hammer (NAVFAC Southwest 2013b). The wharf's landside structural piles would likely be installed from shore using a mobile crawler crane. Pile installation is estimated to take 90 days. The primary fender piles (18-in square) and corner fender piles (13-in diameter) would be installed with a diesel impact hammer. Fender piles are not anticipated to require jetting and would likely be installed using a floating crane barge (NAVFAC Southwest 2013b).

Measures to minimize impacts to water quality would include the following (NAVFAC Southwest 2013b). Floating rafts would be placed under the pier and wharf to catch demolition debris. A Spill Prevention, Control, and Countermeasures Plan would be developed and implemented for the project (NAVFAC Southwest 2013b). To minimize potential releases of creosote, petroleum sheens, and turbidity in the waterway, piles would be quickly placed onto a receiving barge as they are removed from the subsurface. Piles would not be rinsed or washed in any way. The barge's storage area would have a row of hay or straw bales, or filter fabric, placed around the perimeter of the barge to contain runoff from the extracted piles. Temporary erosion and sedimentation control measures would be implemented throughout the project (NAVFAC Southwest 2013b).

The Scripps contractor would use only clean construction materials suitable for use in the oceanic environment (NAVFAC Southwest 2013b). The Scripps contractor would ensure that debris, soil, silt, sand, sawdust, rubbish, cement or concrete washings thereof, chemicals, and oil or petroleum products from construction are not placed where they may be washed by rainfall or runoff into waters of the United States (U.S.) (NAVFAC Southwest 2013b). Upon completion of the project authorized, all excess material or debris would be completely removed from the work area and disposed of in an appropriate upland disposal site. Spill kits and cleanup materials would be present during construction in case of a leak into the surrounding water (NAVFAC Southwest 2013b).

The Scripps Institution of Oceanography Pier Replacement project does not involve dredging. Increased turbidity due to demolition and construction would be localized to the Scripps pier area and would return to background conditions within an hour after the pile removal or installation activity ends (AMEC Earth & Environmental, Inc. [AMEC] 2008). The short duration of the turbidity increase, and implementation the water quality protective measures by contractors for both projects would reduce turbidity associated with the two projects to less than significant. Therefore, the Scripps project would not result in a significant additive water quality impact with that of the Proposed Action (P-151).

4.3.6.2 MILCON P-327 - Pier 12 Replacement at NBSD (Overlap with Proposed Action 2013)

There would be no overlap of dredging activities for the two projects. Dredging for MILCON P-327 is estimated to be completed by end of September 2013 and dredging for the Proposed Action is estimated to commence in October 2013. Other MILCON P-327 underwater demolition and construction work would be completed before September 2013. As stated in Section 3.6.3.2, *Turning Basin* of this EA, the vast majority of sediments resuspended by dredging settle out of the water column near the dredge within 1 hour, and only a small fraction takes longer to resettle (USACE 2008). Should dredging for the Proposed Action begin on 1 October, any remaining turbidity from MILCON P-327 dredging would be minimal, and there would not be a significant additive impact to water quality.

4.3.6.3 MILCON P-440 - Pier 8 Replacement at NBSD (Overlap with Proposed Action 2015 through 2016)

The potential underwater activities that could potentially take place concurrently for both projects would be Proposed Action: dredging, pile removal, pile installation; MILCON P-440: pile removal and pile installation. Should this be the case, acute impacts to water quality would be minimized by the following:

- Increased turbidity due to sediment resuspension during demolition and construction activities would be limited to the areas immediately surrounding NBPL Pier 180 (Proposed Action pile removal and installation) and NBSD Pier 8 (MILCON P-440) (AMEC 2008). Turbidity due to pile removal/installation would return to background conditions within an hour after the activity ends (AMEC 2008).

For the reasons listed above, the acute impacts to water quality of the Proposed Action and MILCON P-440 would not be significant. Therefore, the temporal overlap of the two projects' acute impacts would not result in a significant additive impact to water quality.

In conclusion, the Proposed Action would overlap in proximity and time with the Scripps project, but demolition/construction would be localized to the work site, very short-lived, and minimized with BMPs. The Scripps project does not involve dredging. There would be no temporal overlap of dredging activities for the Proposed Action and MILCON P-327. MILCON P-440 does not involve dredging. Therefore, there would be no significant additive water quality impact from implementation of Alternative 1 or Alternative 2 and these three cumulative projects.

4.3.7 Hazardous Materials and Wastes

With implementation of Alternative 1 or Alternative 2, hazardous materials and wastes and solid wastes would be properly managed according to applicable federal and state regulations. Hazardous materials and wastes at the proposed Navy MMP temporary relocation site at the NMAWC would be removed and properly recycled or disposed before the site is modified for use by the Navy MMP. Hazardous materials/wastes would not be used or stored at the proposed temporary NMAWC site while occupied by the Navy MMP. Under Alternative 1, or Alternative 2, during the time the barges are at the temporary relocation site, the Everingham Brothers Bait Company would continue to manage fuel, hazardous materials, and hazardous wastes according to applicable state and county regulations (Everingham Brothers Bait Company 2012). Hazardous materials currently present at the fuel pier consist of bulk quantities of fuel, lubricating oil, and contaminated petroleum products contained in pipelines that are designed and operated in compliance with federal and state regulations, and undergo frequent inspections by the U.S. Coast Guard (USCG) and the California State Lands Commission (CSLC). The fuel pier follows Basewide BMPs for preventing and containing potential leaks and spills from the pipelines and follows the procedures in the NBPL Emergency Response Action Plan in the event of spills (see Section 3.7.3.2, Subsections Fuel Pier Demolition and Construction and Bulk Fuel Pipelines. Hazardous waste resulting from fuel pier demolition would include building materials falling under the Universal Waste Rule, creosote-treated wood components, and paint that may contain lead or other metals. All hazardous wastes would be properly characterized and disposed at appropriate facilities with sufficient receiving capacity. There are no existing Installation Restoration, Resource Conservation, and Recovery sites or County of San Diego Unauthorized Release Sites on or near the project area that would be affected by implementation of either alternative. The new fuel pier would be built and operated in compliance with all federal and state requirements for pipeline and bulk fuel safety.

The Everingham Brothers Bait Company properly manages and disposes of solid wastes aboard its two San Diego Bay bait barges. Temporary relocation of the barges under Alternative 1 or Alternative 2 would not change solid waste types, volumes, or management practices aboard the barges. Solid waste generated from demolition and construction associated with implementation of Alternative 1 or Alternative 2 would be evaluated for resale, recycling, and diversion in accordance with the Navy Region Southwest (NRSW) Integrated Solid Waste

Management Program to minimize the volume of waste sent to a landfill. For the reasons listed above, implementation of Alternative 1 or 2 would not have a significant impact with respect to solid waste.

As stated above in Section 4.1.3.1, timing for the SIO Pier Replacement project is expected to coincide with the NBPL P-151 Fuel Pier Replacement Project in 2013. The Scripps Pier project would be required to implement measures to minimize impacts relative to hazardous materials/wastes and solid wastes. Other reasonably foreseeable projects are not anticipated to take place concurrently with the Proposed Action, so potential impacts from those projects would be moderated over space and time. Therefore, when added to the impacts from other reasonably foreseeable projects, implementation of either Alternative 1 or Alternative 2 would not result in a significant cumulative impact to hazardous materials, hazardous wastes, and solid waste.

4.3.8 Airborne Noise

As noted above under approach to analysis, airborne noise falls under the acute impact category. With implementation of Alternative 1 or Alternative 2, airborne noise levels would be below established limits (NBPL fuel pier) or very short-term and intermittent (NMAWC Navy MMP temporary relocation site) and construction noise would cease upon completion of demolition/construction activities. Alternative 1 or Alternative 2 and most of the present and reasonably foreseeable projects would not likely occur at the same time and location; except the present project, Replace Fuel Storage Tanks and Facilities at NBPL (MILCONP-401) and the proposed Scripps Pier construction. MILCON P-401 has been underway and is scheduled for completion in January 2014 and the fuel pier project is expected to start in August 2013. The Scripps Pier Replacement project would not begin until the spring of 2014 and would not overlap the construction period of MILCON P-401. Cumulatively for noise impacts, the Proposed Action and the MILCON P-401 can be analyzed independently of the Proposed Action and the Scripps Pier projects since noise generating activities would occur at separate times.

The phase of MILCON P-401 that would overlap the beginning stage of Proposed Action would comprise closing decommissioned USTs in place: removing the tank tops and appurtenances, cleaning the interiors, and backfilling with concrete slurry or clean soil (NAVFAC Southwest 2013c). USTs 76-84 and 173-176 are scheduled for backfill between May and September 2013 (NAVFAC Southwest 2013d). USTs 76-84 are located in the northern part of NBPL and adjacent to residences in the La Playa neighborhood. USTs 173-176 are in the south-central area of NBPL near the Child Development Center (CDC). Earthmoving equipment associated with the backfilling work would be the source of airborne noise during the final phase of MILCON P-401. Once all submittals and approvals are complete and equipment is mobilized, site work for the Proposed Action would commence at the end of September 2013. The beginning stages of the Proposed Action would focus on constructing the temporary SSC marine mammal enclosures and relocating the SSC marine mammals to NMAWC. However, some site work would occur at the fuel pier including excavation and installing landside piping. Noise generating equipment required for backfilling the USTs would be a front-end loader and dump trucks for Tanks 76-84. USTs 173-175 would also require the use of a compactor and water truck in addition to the excavator and dump trucks. Equipment required for shore side work at the fuel pier would also require an excavator and grader. Pile driving work for the Proposed Action would not start until March 2014 and would not overlap Project P-401. It is likely the MILCON P-401 UST backfilling work would be completed before the end of September when the fuel pier site work gets underway, but it is possible there could be overlapping work involving noise-generating equipment.

During the backfilling of USTs 76-84 and the early stages of fuel pier site work, noise levels at residences in La Playa would be dominated by the MILCON P-401 UST backfilling activities because the residences are only about 75 ft from the USTs, but 2,600 ft away from the fuel pier work area. Noise levels during the UST backfilling would be approximately 73.5 A-weighted decibels (dBA) at the La Playa residences closest to the USTs. Noise levels generated from the fuel pier construction reaching those same residences would be about 48.1 dBA. Since there would be such a large difference in noise levels from the two sources, and noise is added logarithmically, the 73.5 dBA from the UST backfilling would completely overpower the lesser noise from the fuel pier site work (48.1 dBA). The resultant noise level at the La Playa residences would not change from 73.5 dBA. Therefore, there would be no significant cumulative impacts in the La Playa neighborhood due to noise generated from implementation of Alternative 1 or Alternative 2 occurring at the same time as noise from MILCON P-401.

The other receptor potentially affected by cumulative noise impacts from MILCON P-401 and the Proposed Action would be the NBPL CDC. The CDC is about 780 ft away from USTs 173-176 planned for backfilling under MILCON P-401. Backfilling the USTs would generate outdoor noise levels of about 59.6 dBA at the CDC. Onshore earthmoving and construction for the fuel pier activities would be about 1,880 ft from the CDC. Grading and excavating activities for the Proposed Action would generate outdoor noise levels of 50.9 dBA at the CDC. The noise from the P-401 UST backfilling combined with the noise from the fuel pier site work would produce outdoor noise levels at the CDC that would be approximately 60.2 dBA. Since outdoor noise levels are reduced by 25 dBA inside a building with windows closed, 60.2 dBA would be reduced inside the CDC to 35.2 dBA, slightly above the classroom criteria of 35 dBA (60.2dBA - 25 dBA = 35.2 dBA). If the P-401 UST backfilling is completed in September 2013 as scheduled and the fuel pier onshore site work begins at the end of September as planned, there would be no overlap of noise-generating activities from the Proposed Action and MILCON P-401. Should the MILCON P-401 UST backfilling continue for several weeks or a month beyond the scheduled end date and overlap Proposed Action onshore construction, the cumulative noise impact would be very short-term and one of the BMPs described in Section 3.8.3.2 (noise monitoring for classroom criteria) could be implemented if additional noise attenuation is desired. Therefore, there would be no significant cumulative impacts to the NBPL CDC due to noise generated from implementation of Alternative 1 or Alternative 2 occurring at the same time as noise from MILCON P-401.

The SIO Pier Replacement project would be located approximately 400 ft from residential areas in the La Playa neighborhood north of NBPL. Assuming similar construction activities as

Alternative 1, estimated noise levels for the Scripps Pier project are shown in Table 4.2-1. Noise levels in La Playa would be strongly dominated by the noise generated at the Scripps Pier with 78.2 dBA when combined with Alternative 1, but would be 78.1 dBA if only the Scripps Pier noise is considered. On the other hand, noise levels at the NBPL CDC would be 64.6 dBA cumulatively but would be 63.2 dBA when Alternative 1 is considered by itself. Either case exceeds the classroom criteria, but the noise levels would not be continuous and it is likely that modern construction design and materials used in the CDC building would provide a sufficient sound buffer so that indoor noise levels would not exceed the classroom criteria. Some or all of the BMPs described in Section 3.8.3.2 (noise monitoring for classroom criteria, acoustic blankets around the pile driver, or use of pile cushions) could be implemented if additional noise attenuation is desired. Noise levels from the Scripps project alone would not exceed the San Diego construction noise ordinance limit of 75 dBA at La Playa because the UCSD/SIO would place the following requirements to limit noise levels (UCSD and Navy 2013).

- The contractor shall not exceed a 12-hour average sound level of 75 dBA at any noise-sensitive land use between 7:00 AM and 7:00 PM, Monday through Saturday. The contractor may employ the use of sound cushions or insulation blankets to meet this threshold.
- Construction equipment shall be properly outfitted and maintained with the manufacturer's recommended noise-reduction devices to minimize construction-generated noise.
- Stationary construction noise sources such as generators or pumps shall be located at least 100 ft from noise-sensitive land uses as possible.
- Laydown and construction vehicle staging areas shall be located as far from noise-sensitive land uses as possible.
- All neighboring land uses that would be subject to construction noise shall be informed at least 2 weeks prior to the start of each construction project, whenever possible.

Table 4.2-1. Cumulative Noise Levels at La Playa and NBPL CDC

Receptor Point	*Distance from Alternative1 or 2[1] Miles(km)*	*Distance from Scripps Pier Miles*	*Construction-Related Noise (dBA Leq)*		
			Alternative 1 or 2 only[1]	*Scripps Pier only*	*Combined noise levels*
La Playa	0.47 (0.73)	0.07(0.12)	62.3	<75	Scripps + 0.1
CDC NBPL (Building 377)	0.42 (0.68)	0.68 (1.1)	63.2[3]	59.0	64.6[2]

Notes [1]Approach pier construction used for cumulative impacts since it is the highest noise levels relative to La Playa.
[2] Exceeds recommended classroom criteria of 60 dBA Leq outdoor noise levels for an interior noise level of 35 dBA with windows closed. Refer to best management practices in Section 3.8.3.2 for noise monitoring for classroom criteria and additional noise reduction measures if results indicate further reductions are necessary.

The cumulative contribution from Alternative 1 or Alternative 2 would be negligible to the Scripps Pier noise because the difference is over 10 decibels (dB) and, at most, would raise the levels by one tenth of a dBA energy equivalent levels (Leq). Therefore, implementation of

Alternative 1 or Alternative 2, in conjunction with other projects listed in Section 4.1, would not result in significant cumulative noise impacts.

In summary, there are two concurrent projects located near enough to the Proposed Action to potentially generate cumulative noise impacts: Replace Fuel Storage Tanks and Facilities at NBPL (MILCON P-401) and the SIO USCD Marine Facility Research Vessel Berthing Pier Replacement. For the reasons described above, the noise from the implementation of either Alternative 1 or Alternative 2, combined with noise from either of these two projects, would not result in a significant cumulative noise impact to the identified receptors: residences in La Playa near the northern border of NBPL, or the NBPL CDC.

4.3.9 Air Quality

4.3.9.1 Criteria Pollutants

Alternative 1

As noted above under approach to analysis, air quality falls under the lingering impact category. The region of influence (ROI) in this air quality cumulative effects analysis includes the SDAB. With implementation of Alternative 1 or Alternative 2, the minor impacts to air quality that could contribute to potential cumulative impacts would be from the short-term air emissions from trucks and vehicles used during the construction of the project. Operational air emissions from Alternative 1 would not change from existing conditions and would not result in long-term increases in air emissions. Cumulative projects would also be required to conform to Clean Air Act (CAA) conformity requirements and the SDAB State Implementation Plan (SIP) and would not produce significant amounts of air emissions.

Nominal cumulative impacts would result from Alternative 1, in conjunction with impacts from other potentially cumulative projects (listed in Section 4.1). For all projects, construction and operation activities would produce air emissions that would be well below applicable CAA conformity significance thresholds.

The one project that could have combined cumulative air impacts is the Scripps Pier construction project, which would occur at the same time as Alternative 1 and involve similar activities. The emissions associated with the Scripps Pier construction project were obtained from the Draft EA and Initial Study, SIO/UCSD Marine Facility Berthing Wharf and Pier Replacement (UCSD and Navy 2013). Table 4.2-2 presents a summary of the cumulative emissions from Alternative 1 and the Scripps Pier Replacement construction project.

Table 4.2-2. Cumulative Construction Emissions for NBPL Fuel Pier Replacement – Alternative 1 and Scripps Pier Replacement Project

Construction Year	*Emissions (tons/year)*					
	CO[1]	*VOCs*[2]	*NOx*[2,3]	*SOx*[3]	*PM_{10}*[3]	*$PM_{2.5}$*[3]
2013 – NBPL Fuel Pier	2.69	0.24	1.50	0.00	0.07	0.05
Total 2013	**2.69**	**0.24**	**1.50**	**0.00**	**0.07**	**0.05**
2014 – NBPL Fuel Pier	15.63	3.04	39.70	0.05	1.17	1.03
2014 – Scripps Pier	4	1	18	<1	2	<1
Total 2014	**19.63**	**4.04**	**57.70**	**<1**	**3.17**	**<2**
2015 – NBPL Fuel Pier	22.84	14.27	44.89	0.07	1.90	1.63
2015 – Scripps Pier	3	<1	7	0	1	<1
Total 2015	**25.84**	**15.27**	**51.89**	**0.07**	**2.90**	**2.63**
2016 – NBPL Fuel Pier	14.24	9.75	35.52	0.05	1.26	1.10
Total 2016	**14.24**	**9.75**	**35.52**	**0.05**	**1.26**	**1.10**
de minimis Threshold/ Major Source Threshold[4]	100	100	100	100	100	100
Exceeds Threshold?	No	No	No	No	No	No

Notes: (1) SDAB is considered a maintenance area for the CO NAAQS.

(2) SDAB is currently classified as a marginal nonattainment area for the 8-hour O_3 NAAQS; VOCs and NOx are precursors to the formation of O_3.

(3) SDAB is in attainment of the NAAQS for NOx, SOx, PM_{10}, and $PM_{2.5}$.

(4) *de minimis* thresholds are developed from the General Conformity Rule for nonattainment and maintenance pollutants; NAAQS attainment pollutants (i.e., SOx, PM_{10}, and $PM_{2.5}$) are evaluated based on SDAPCD major source thresholds.

CO = carbon monoxide; NOx = nitrogen oxide; $PM_{2.5}$ = particulates less than 2.5 microns in diameter; PM_{10} = particulates less than 10 microns in diameter; SDAB = San Diego Air Basin; SOx = sulfur oxide; VOCs = volatile organic compounds.

The combined air emissions of Alternative 1 and cumulative projects would not contribute to an exceedance of an ambient air quality standard. As a result, proposed construction and operational activities would produce less than cumulatively considerable air quality impacts. Therefore, Alternative 1, in conjunction with the potentially cumulative projects listed in Section 4.1, would not result in significant cumulative impacts to air quality.

Alternative 2

The air quality impacts from Alternative 2 would essentially be the same as described under Alternative 1. Therefore, implementation of Alternative 2 would not result in significant cumulative impacts to air quality.

4.3.9.2 Greenhouse Gas (GHG) Cumulative Effects Analysis

The potential effects of GHG emissions are by nature global and cumulative and it is impractical to attribute climate change to individual activities. Therefore, an appreciable impact on global climate change would only occur when GHG emissions associated with Alternative 1 or

Alternative 2 are combined cumulatively with GHG emissions from other man-made activities on a global scale.

Alternative 1

Table 4.2-3 summarizes the annual GHG emissions that would occur with implementation of Alternative 1.

Table 4.2-3. Estimated Annual GHG Emissions – Alternative 1

Construction Year	*Metric tons per year*			
	CO_2	*CH_4*	*N_2O*	*CO_2e*[1]
2013	1,455	0.26	10.18	4,615
2014	4,898	1.32	6.26	6,843
2015	6,498	1.42	7.35	8,806
2016	5,178	1.58	6.20	7,133

Note: [1]$CO_2e = CO_2 + (21 * CH_4) + (310 * N_2O)$

CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent

As an indication of the nominal relative magnitude of these emissions, total annual carbon dioxide equivalent (CO_{2e}) emissions in the U.S. were approximately 7 billion metric tons in 2008 (USEPA 2010). Total CO_{2e} emissions in California in 2008 were approximately 474 million metric tons (California Air Resources Board [CARB] 2011).

Potentially cumulative projects near Alternative 1 (listed in Section 4.1) could also release a nominal amount of GHGs from construction and operation activities when compared to the total annual CO_{2e} emissions in the U.S. In addition, in response to Department of Defense (DoD) directives such as EO 13221, *Energy Efficient Standby Power Devices* and EO 13423, *Strengthening Federal Environment, Energy, and Transportation Management*, the Navy has taken a number of steps to reduce GHG emissions from their activities. These actions include developing energy efficient technologies and weapons systems, improving military and civilian vehicles fuel efficiency, utilizing alternative fuel vehicles and electric vehicles, improving energy efficiency at Navy facilities, and installing solar and other renewable energy sources at Navy facilities. Therefore, when GHG impacts from Alternative 1 are added to the GHG impacts from the cumulative projects, there would not be significant GHG cumulative impacts to global climate change from implementation of Alternative 1.

Alternative 2

The GHG effects from implementation of Alternative 2 would be similar to those effects from Alternative 1. Therefore, there would not be significant GHG cumulative impacts to global climate change from implementation of Alternative 2.

4.3.10 Transportation and Circulation

As noted above under approach to analysis, transportation and circulation falls under the acute impact category. Traffic from present and reasonably foreseeable future projects is included in the Baseline condition, which consists of existing traffic volumes, plus an annual traffic growth factor. (Note that the traffic generation associated with past projects is included in the existing traffic data collection.) The annual traffic growth factor includes traffic generated by each of the present and reasonably foreseeable future projects described above in Section 4.1, plus traffic generated by projected future projects lying outside the ROI, but whose trips would traverse the street network that provides access to the Proposed Action. As discussed in Section 3.10, increased traffic due to local and regional development is projected to result in Level of Service (LOS) E conditions on three street segments (Rosecrans Street from Nimitz Boulevard to North Harbor Drive, and from North Harbor Drive to Canon Street, and Canon Street from Rosecrans to Locust Street). However, the proposed project construction and operation would not add any additional trips to any street segments that are characterized by LOS E under Baseline conditions. Accordingly, the proposed project would not contribute toward any significant cumulative traffic effect.

The Scripps Pier and P-401 projects are cumulative projects located proximate to the Proposed Action whose traffic generation is included in the Baseline traffic scenario. As discussed above, construction activities for the proposed Scripps Pier replacement project are expected to occur at the same time as those of Alternative 1 or 2. According to data furnished by SIO UCSD through their engineering consultant (Anchor QEA 2012), up to 30 workers and 12 trucks may access the site on a daily basis during construction. Workers for the Scripps project would access that worksite using Rosecrans Street. Assuming one inbound and one outbound trip for each worker and truck, the Scripps Pier replacement project would add 84 daily vehicle trips to Rosecrans Street. The P-401 project has a traffic generation of 340 daily trips (Navy 2007). The addition of traffic from these two projects would result in an increase of 424 daily trips on segments of Rosecrans Street characterized by LOS E conditions (i.e., from Nimitz Boulevard to North Harbor Drive, and from North Harbor Drive to Canon Street; see Section 3.10). The change in the volume to capacity (V/C) ratio on these segments due to P-401 and Scripps Pier trips is 1.06 percent (i.e., 424 daily trips divided by the LOS E Capacity of 40,000). The City of San Diego's significance criteria is a 2.0 percent increase on segments characterized by LOS E or F. As noted above, because of the temporary relocation of MMP personnel, the Proposed Action would not add any trips to either of these segments.

The Navy would coordinate with the USCG to issue a Notice to Mariners when in-water components of this project are occurring. As shown in Figure 2-5, all of the in-water construction zone for the proposed fuel pier replacement project would be within an existing navigation restricted area (Security Zone) that is off-limits to civilian vessels. Most of the Scripps Pier in-water construction zone is in Navy waters, and it would lie within the Security Zone as well. There would be about 600 ft of open water between the part of the Scripps Pier construction zone that is outside the Security Zone and the southern tip of Shelter Island, leaving sufficient space for civilian vessels. Therefore, implementation of either Alternative 1 or Alternative 2, in conjunction with other projects listed in Section 4.1 would not result in significant cumulative impacts to transportation, circulation, and marine traffic.

4.3.11 Socioeconomics and Environmental Justice

Impacts to socioeconomics and environmental justice from Alternative 1 or Alternative 2 would be beneficial overall. There would be indirect, temporary, adverse impacts to the charter fishing industry, which would be less than significant. It is likely that none of the reasonably foreseeable projects described in Section 4.1 would reduce beneficial impacts or exacerbate adverse impacts. Therefore, implementation of either Alternative 1 or Alternative 2, in conjunction with other projects listed in Section 4.1, would not result in significant cumulative impacts to socioeconomics and environmental justice.

4.4 CUMULATIVE IMPACTS CONCLUSION

Cumulative impacts to the environmental resource areas evaluated herein from Alternative 1 or Alternative 2, in conjunction with other past, present, and reasonably foreseeable actions, would not be significant.

CHAPTER 5
OTHER NEPA CONSIDERATIONS

5.1 POSSIBLE CONFLICTS BETWEEN THE ACTION AND THE OBJECTIVES OF FEDERAL, REGIONAL, STATE, AND LOCAL PLANS, POLICIES, AND CONTROLS

Implementation of Alternative 1 or Alternative 2 would be consistent with federal, regional, state and local plans, policies, and controls to the extent required by federal law and regulation. No potential conflicts have been identified. Table 5.1-1 provides a summary of environmental compliance with implementation of Alternative 1 or Alternative 2.

5.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Resources that are irreversibly or irretrievably committed to a project are those that are used on a long-term or permanent basis. This includes the use of non-renewable resources such as metal and fuel, and other natural or cultural resources. These resources are irretrievable in that they would be used for this project when they could have been used for other purposes. Human labor is also considered an irretrievable resource. Another impact that falls under this category is the unavoidable destruction of natural resources that could limit the range of potential uses of that particular environment.

Although proposed demolition and construction activities would result in the consumption of fuel, concrete, and steel, Alternative 1 or Alternative 2 would not result in a significant irreversible or irretrievable commitment of resources at NBPL or NMAWC.

5.3 RELATIONSHIP BETWEEN SHORT-TERM ENVIRONMENTAL IMPACTS AND LONG-TERM PRODUCTIVITY

NEPA requires an analysis of the relationship between a project’s short-term impacts on the environment and the effects that these impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. This refers to the possibility that choosing a single development option reduces future flexibility in pursuing other options, or that giving over a parcel of land or other resource to a certain use often eliminates the possibility of other uses being performed at that site.

Alternative 1 or Alternative 2 would, reversibly, dedicate parcels of land, equipment, and other resources to a particular use during a limited period of time. These resources would not be available for other productive uses throughout the duration of the project. However, these impacts are considered negligible, as the facilities and geographic areas associated with Alternative 1 or Alternative 2 are designated for and have historically accommodated the types of uses proposed. Therefore, Alternative 1 or Alternative 2 would not result in any impacts that would reduce environmental productivity or permanently narrow the range of beneficial uses of the environment.

Table 5.1-1. Status of Compliance with Relevant Land Use Plans, Policies, and Controls

Plans, Policies, and Controls	*Responsible Agency*	*Status of Compliance*
NEPA (42 USC § 4321 *et seq*.) Department of the Navy Procedures for Implementing NEPA (32 CFR 775)	U.S. Navy	This EA has been prepared in accordance with the CEQ Regulations implementing NEPA and U.S. Navy NEPA procedures.
Coastal Zone Management Act (16 CFR § 1451 *et seq*.)	U.S. Navy	The Coastal Zone Management Act (CZMA) of 1972 (16 USC Section 1451) encourages coastal states to be proactive in managing coastal zone uses and resources. CZMA established a voluntary coastal planning program and participating states submit a Coastal Management Plan to the National Oceanic and Atmospheric Administration for approval. Under the CZMA, federal agency actions within or outside the coastal zone that affect any land or water use or natural resource of the coastal zone shall be carried out in a manner that is consistent to the maximum extent practicable with the enforceable policies of the approved state management programs. Each state defines its coastal zone in accordance with the CZMA. Excluded from any coastal zone are lands the use of which by law is subject solely to the discretion of the federal government or which is held in trust by the Federal government (16 USC 1453). Accordingly, although Naval Base Point Loma land is federal government property and therefore, excluded from the coastal zone, the Navy nonetheless conducted an effects analysis as part of its determination of the action's effects for purposes of federal consistency review under the CZMA. This was done to factually determine whether the action (even if conducted entirely within a federal enclave) would affect any coastal use or resource. A Coastal Consistency Determination (CD-011-13) was prepared by the Navy and provided to the CCC (refer to Appendix A). The CCC concurred with the Navy's CD and found the project to be consistent, to the maximum extent practicable, with the California Coastal Management Program (see Appendix A).
CWA (§§ 401-402 and 404, 33 USC § 1251 *et seq*.)	USEPA, U.S. Army Corps of Engineers (USACE)	Alternative 1 or Alternative 2 would not involve the release of chemicals requiring an NPDES permit. A construction NPDES permit would be obtained that would remain in effect for the length of the project. The project would involve in-water demolition, dredging, and construction activities for which a CWA Section 404/ Rivers and Harbors Act Section 10 permit from the USACE would be obtained, along with the related Section 401 Water Quality Certification from the RWQCB.
CAA, as amended (42 USC § 7401 *et seq*.)	USEPA	Per CAA regulations, Alternative 1 or Alternative 2 would not compromise air quality attainment status or conflict with attainment status and maintenance goals established in the SDCAPCD SIP. A formal CAA conformity determination is not required. Alternative 1 or Alternative 2 would be in compliance with the CAA and would comply with all applicable SDCAPCD Rules and Regulations.
Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986, 42 USC §§ 11001-11050.	U.S. Navy	The Navy would inform Local Emergency Planning Committees of Alternative 1 or Alternative 2 as required to assist them in developing plans to prepare for and respond to chemical emergencies.

Table 5.1-1. Status of Compliance with Relevant Land Use Plans, Policies, and Controls

Plans, Policies, and Controls	*Responsible Agency*	*Status of Compliance*
EO 11990, *Protection of Wetlands* (42 Federal Register 26961)	U.S. Navy	Alternative 1 or Alternative 2 would not impact wetlands (none are present in the proposed project areas at NBPL and NMAWC) and would be in compliance with EO 11990.
ESA (16 USC § 1531)	USFWS/NMFS	Alternative 1 or Alternative 2 are not likely to adversely affect any federally listed endangered or threatened species or critical habitat and the Navy made a no effect determination on the California least tern and western snowy plover. The Navy would fully comply with the Least Tern MOU presented in Appendix E.2 of this EA. The Navy consulted informally with NMFS (green sea turtle) and NMFS provided a letter (see Appendix A) concurring with the Navy's determination that the Proposed Action may affect, but is not likely to adversely affect green sea turtles; therefore, Alternative 1 or Alternative 2 would be in compliance with the ESA.
Marine Mammal Protection Act of 1972 (16 USC § 1361-1407)	NMFS	Non-injury, Level B behavioral takes of marine mammals are likely to occur as a result of pier demolition and construction. With implementation of monitoring and ramp-up procedures as proposed, no Level A (permanent hearing loss) takes would occur, and Level B takes due to temporary hearing loss are unlikely to occur for Alternative 1 or Alternative 2. The Navy prepared and provided an Incidental Harassment Authorization (IHA) Application and an associated Monitoring Plan to NMFS (for the anticipated marine mammal takes) for approval before commencing in-water demolition/construction activities. NMFS accepted the IHA Application and Monitoring Plan and issued an IHA (refer to Appendix A); therefore, Alternative 1 or Alternative 2 would be in compliance with the MMPA.
EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (59 Federal Register 7629)	U.S. Navy	There would be no disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. Alternative 1 or Alternative 2 would be in compliance with EO 12898.
EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (62 Federal Register 19885)	U.S. Navy	Under Alternative 1 or Alternative 2, the proposed project activities during demolition of the existing fuel pier and construction and operation of the proposed new fuel pier would take place within military facilities that are off-limits to the general public, and where children are not present. The shoreside construction zones would be fenced and warning signs would be posted to prevent unauthorized access. In-water construction zones would be marked with buoys and signs to restrict entry by civilian vessels. The proposed demolition of the existing fuel pier, and construction and operation of the new fuel pier would be performed in compliance with all applicable federal and state requirements for hazardous material and hazardous waste management, bulk fuel storage and transfer, and workplace safety. These measures would minimize environmental health and safety risks to the public overall, including children. For these reasons, Alternative 1 or Alternative 2 would not disproportionately expose children to environmental health risks or safety risks and would be in compliance with EO 13045.
EO 13089, *Coral Reef Protection* (63 Federal Register 32701)	U.S. Navy	Alternative 1 or Alternative 2 would not affect any coral reef ecosystem and would be in compliance with EO 13089.

Table 5.1-1. Status of Compliance with Relevant Land Use Plans, Policies, and Controls

Plans, Policies, and Controls	*Responsible Agency*	*Status of Compliance*
Magnuson-Stevens Fishery Conservation and Management Act 16 U.S.C § 1801, et. Seq. as amended by the Sustainable Fisheries Act of (Public Law 104-267)	NMFS	Alternative 1 or Alternative 2 would have minimal adverse effects on EFH for federally managed fish species within the Coastal Pelagic Species and West Coast Groundfish FMPs. These effects would be temporary and limited in scope, and eelgrass habitat shaded by the proposed fuel pier, and as impacted by the SSC Marine Mammal Program relocation, would be offset through use of the Navy's established eelgrass mitigation bank. Both Alternative 1 and Alternative 2 contain measures to avoid and minimize any potential adverse effects to EFH (see Appendix E.1). In conjunction with the NEPA process, the Navy consulted informally with NOAA/NMFS. An EFH analysis was conducted with an adverse effects finding. However, the Conservation Recommendation forwarded in the NOAA Fisheries response to the Navy EFH Analysis will be integrated into the Proposed Action (refer to Appendix A), therefore, Alternative 1 or Alternative 2 would be in compliance with the Magnuson-Stevens Fishery Conservation and Management Act.
EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds* (66 Federal Register 3853)	U.S. Navy	Alternative 1 or Alternative 2 are not likely to have a measurable negative effect on migratory bird populations and would be in compliance with EO 13186.
NHPA (Section 106, 16 USC 470 *et seq.*)	Advisory Council in Historic Preservation, California State Historic Preservation Office	Alternative 1 or Alternative 2 would be designed to avoid effects on NRHP or eligible properties. Alternative 1 or Alternative 2 would not affect any *known* archaeological sites or other *known* cultural resources at NBPL, as none are found within the Area of Potential Effect (APE) at, as defined under the Navy Region Southwest (NRSW) Metro San Diego Programmatic Agreement (PA). The DFSP Fuel Pier (Pier 180, built in 1908 and 1942) has previously been determined by consensus and consultation to be ineligible for the National Register of Historic Places. The construction laydown area at NBPL would be staged outside the 100-meter APE buffer of identified historic properties in the nearby Fort Rosecrans Historic District. A 1997 investigation inventoried and evaluated all of NMAWC and concluded that NMAWC contains no built properties or archaeological resources eligible for listing in the National Register of Historic Places. However, while there are no identified built or archaeological historic properties within the APE at NBPL, there is a buried archaeological *potential* under the quay wall fill shoreside of the existing fuel pier. The project would implement on-site monitoring by qualified archaeologists to identify any such features or deposits encountered during site preparation excavations on the quay wall portion of the project area. Through these procedures, Alternative 1 or Alternative 2 would be in compliance with the NHPA.
Sikes Act Improvement Act (16 USC § 670a *et seq.*)	U.S. Navy	Alternative 1 or Alternative 2 would be in compliance with the Sikes Act Improvement Act.

5.4 GROWTH INDUCEMENT

CEQA Guidelines (§15126.2(d)) require that an environmental review document evaluate the growth inducing impacts of a proposed project:

"Discuss the way in which a proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects that would remove obstacles to population growth (a major expansion of a wastewater treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also, discuss the characteristic of some projects that may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment."

A project can bring about the potential for direct and/or indirect growth inducement. A project can lead to direct growth inducement if it involves the development of new housing units. A project can create the potential for indirect growth inducement if it would create sizable new permanent employment opportunities or if it would involve a substantial construction effort with sizable short-term employment opportunities that would indirectly stimulate the need for additional housing and services to support a large temporary population. A project would also have an indirect growth inducement effect if it would remove obstacles to additional growth and development, such as removing a constraint on a required public service, for instance additional public infrastructure such as new roads or increased utilities capacity.

The Point Loma Fuel Pier Replacement project would be a temporary construction project to replace existing infrastructure that is not intended for use by the general public; it would not be expected to induce growth either directly or indirectly. The project would not induce any direct growth because it would not involve the construction of new housing units. There would be no indirect growth because the project would provide no permanent new employment opportunities, and the temporary demand for construction employment could be filled by the existing construction labor supply of San Diego County. Also, since the project replaces existing infrastructure and enables the continuation of activities that currently take place, the project would not encourage, facilitate, or remove constraints on new activities that would lead to new growth.

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Appendix A

Agency Correspondence

Appendix B

Public Involvement

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Appendix C

Unified Facilities Criteria (UFC)

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Appendix D

Sampling and Analysis Report for Naval Base Point Loma Fuel Pier Replacement and Dredging (MILCON Project P-151)

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Appendix E

Marine Biological Resources

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Appendix E.1

Essential Fish Habitat Assessment for NBPL Fuel Pier Replacement and Dredging (MILCON P-151)

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Appendix E.2

Memorandum of Understanding Between U.S. Fish and Wildlife Service and the U.S. Navy Concerning Conservation of the Endangered California Least Tern in San Diego Bay, California

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Appendix E.3

Approval for Use of Established Eelgrass Mitigation Bank Credits

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Appendix E.4

Acoustic Transmission Loss Model for Pile Driving

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Appendix E.5

Ambient Underwater Sound Measurements in San Diego Bay

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Appendix F

Airborne Noise Modeling Data

Appendix G

Record of Non-Applicability for Clean Air Act Conformity (RONA) and Air Quality Data

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Appendix H

Traffic Count Data

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Appendix I

Water and Sediment Quality Investigation

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