- Beauty Bay Washington, LLC, Seattle, WA changes to Beauty Bay Washington, LLC, Edmonds, WA
- Blue North Fisheries, Inc, Seattle, WA changes to Blue North Fisheries, Inc., Seattle, WA
- Clipper Group, Ltd, Seattle, WA changes to Clipper Group, Ltd., Seattle, WA
- Liberator Fisheries, LLC, Seattle, WA changes to Liberator Fisheries LLC, Seattle, WA
- Siberian Sea Fisheries, LLC, Seattle, WA changes to Siberian Sea Fisheries LLC, Seattle, WA

Alaska Longline Cod Commission's proposed amendment of its Export Trade Certificate of Review would result in the following Membership list:

1. Akulurak LLC, Seattle, WA;
2. Alaskan Leader Fisheries LLC, Lynden, WA;
3. Alaskan Leader Seafoods LLC, Lynden, WA;
4. Alaskan Leader Vessel LLC, Lynden, WA;
5. Aleutian Spray Fisheries, Inc., Seattle, WA;
6. Beauty Bay Washington, LLC, Edmonds, WA;
7. Bering Leader Fisheries LLC, Lynden, WA;
8. Blue North Fisheries, Inc., Seattle, WA;
9. Blue North Trading Company, LLC, Seattle, WA;
10. Bristol Leader Fisheries LLC, Lynden, WA;
11. Clipper Group, Ltd., Seattle, WA;
12. Clipper Seafoods, Ltd., Seattle, WA;
13. Coastal Villages Longline LLC, Anchorage, AK;
14. Deep Sea Fisheries, Inc., Everett, WA;
15. Gulf Mist, Inc., Everett, WA;
16. Liberator Fisheries LLC, Seattle, WA;
17. Northern Leader Fisheries LLC, Lynden, WA;
18. Prowler Fisheries, LLC, Seattle, WA;
19. Romanzof Fishing Company, L.L.C., Seattle, WA;
20. Shelford's Boat, Ltd., Mill Creek, WA;
21. Siberian Sea Fisheries LLC, Seattle, WA;
22. Siu Alaska Corporation, Anchorage, AK;
23. Tatoosh Seafoods, LLC, Edmonds, WA.

Dated: August 16, 2018.

Joseph Flynn,

Director, Office of Trade and Economic Analysis, International Trade Administration.

[FR Doc. 2018–18051 Filed 8–21–18; 8:45 am]

BILLING CODE 3510–DR–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XG105

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Mission Bay Ferry and Water Taxi Landing Project in San Francisco Bay, California

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; proposed incidental harassment authorization; request for comments on proposed authorization and possible renewal.

SUMMARY: NMFS has received a request from the Port of San Francisco for authorization to take marine mammals incidental to the Mission Bay Ferry and Water Taxi Landing Project in San Francisco Bay, California. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an incidental harassment authorization (IHA) to incidentally take marine mammals during the specified activities. NMFS is also requesting comments on a possible one-year renewal that could be issued under certain circumstances and if all requirements are met, as described in *Request for Public Comments* at the end of this notice. NMFS will consider public comments prior to making any final decision on the issuance of the requested MMPA authorization and agency responses will be summarized in the final notice of our decision.

DATES: Comments and information must be received no later than September 21, 2018.

ADDRESSES: Comments should be addressed to Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service. Physical comments should be sent to 1315 East-West Highway, Silver Spring, MD 20910 and electronic comments should be sent to *ITP.redding@noaa.gov*.

Instructions: NMFS is not responsible for comments sent by any other method, to any other address or individual, or received after the end of the comment period. Comments received electronically, including all attachments, must not exceed a 25-megabyte file size. Attachments to electronic comments will be accepted in Microsoft Word or Excel or Adobe PDF file formats only. All comments received are a part of the public record and will generally be posted online at *https://www.fisheries.noaa.gov/node/23111* without change. All personal identifying information (*e.g.,* name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: Gray Redding, Office of Protected Resources, NMFS, (301) 427–8401. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities.* In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

The MMPA prohibits the "take" of marine mammals, with certain exceptions. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed incidental take authorization may be provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other "means of effecting the least practicable [adverse] impact" on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stocks for taking for certain subsistence uses (referred to in shorthand as "mitigation"); and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth. The definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below.

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*) and NOAA Administrative Order (NAO) 216–6A, NMFS must review our proposed action (*i.e.,* the issuance of an incidental harassment authorization) with respect to potential impacts on the human environment.

This action is consistent with categories of activities identified in Categorical Exclusion B4 (incidental harassment authorizations with no anticipated serious injury or mortality) of the Companion Manual for NOAA Administrative Order 216–6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has preliminarily determined that the issuance of the proposed IHA qualifies to be categorically excluded from further NEPA review.

We will review all comments submitted in response to this notice prior to concluding our NEPA process or making a final decision on the IHA request.

Summary of Request

On November 2, 2017, NMFS received a request from the Port of San Francisco for an IHA to take marine mammals incidental to pile driving and drilling in San Francisco Bay. NMFS determined that a revised version of the Port's application was adequate and complete on June 22, 2018. The Port of San Francisco's request is for take of seven species of marine mammals by Level B harassment only. Neither the Port of San Francisco nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

Description of Proposed Activity

Overview

The port of San Francisco proposes to construct the Mission Bay Ferry Landing (MBFL) and Water Taxi Landing (WTL) on San Francisco Bay, within the Port of San Francisco's Southern Waterfront in the Mission Bay/Central Waterfront area (see Figure 1 of IHA Application). The project's proposed activities that have the potential to take marine mammals include vibratory and impact pile driving, vibratory pile removal, and down the hole drilling. In addition, the project will include dredging, however authorization of take from this activity is neither requested nor proposed for authorization.

The Mission Bay Ferry Landing, a single-float, two-berth ferry landing will provide critical regional ferry service to and from the Mission Bay neighborhood, one of the fastest growing neighborhoods in San Francisco, as well as the Dogpatch, Potrero Hill, Pier 70, and the Central Waterfront neighborhoods. The separate single float, two-berth Water Taxi Landing will provide local water taxi access to the Mission Bay area and surrounding neighborhoods.

Dates and Duration

The Port of San Francisco's construction, including dredging, vibratory and impact pile driving, and drilling for installation of the pier and floating docks will occur from June through November of 2019 (environment working windows for dredging in this region of the San Francisco Bay established by the San Francisco Bay Long Term Management Strategy (LTMS Agencies, 2001). The maximum number of construction days possible, including dredging and all other activities, is 55 days. The maximum total number of days for pile installation and removal are 15 days.

Specific Geographic Region

As stated, the project is located in San Francisco Bay within the Port of San Francisco's Southern Waterfront in the Mission Bay/Central Waterfront area. The specific geographic location for the project is provided in Figures 1 and 2 of the IHA Application. The project site is approximately three kilometers south of the San Francisco-Oakland Bay Bridge, on the western side of San Francisco Bay in the Central Basin. The nearby waterfront is an active recreational and commercial port and shipyard.

Detailed Description of Specific Activity

Demolition

Based on preliminary bathymetric surveys and historic information, The Port anticipates that buried remnants of concrete and wood debris from Pier 64–66 apron may be encountered within the Ferry Landing dredge boundary. All debris encountered during dredging operations will be removed and disposed of at an approved upland location.

In addition, existing piles will be pulled with a cable choker or removed with a vibratory hammer and every effort will be made to remove the entire pile length. If it is necessary to utilize vibratory hammer to remove a pile the process will consist of approximately 1–2 minutes of initial vibratory use while pulling the pile up to loosen it from the sediment. The barge/crane then moves to the next pile to loosen. The operator will do this for five to eight piles then remove the vibratory driver and go back to dead pull the loosened piles and place them on a debris barge for disposal at a permitted facility. The vibratory use is minimal to just loosen the pile. Noise generated from the operation of the vibratory hammer is expected to result in the behavioral disturbance of marine mammals and, therefore, take authorization is requested, and accounted for in the ''Take Calculation and Estimation'' section below.

Dredging

Dredging of approximately 129,374 cubic yards will be conducted to a depth of −15 feet (ft) MLLW +2 ft of overdepth within the Ferry Landing dredge boundary, and to a depth of −8ft MLLW +1 ft overdepth within the Water Taxi Landing dredge boundary.

Best Management Practices (BMPs) will be detailed in a Dredge Operations Plan (DOP) submitted to the regulatory agencies for approval before dredging begins, and implemented. Dredging will be performed from a barge-mounted crane with a clam shell bucket. Sediment will be transferred into adjacent barges for transport to permitted placement site(s). All debris encountered during dredging operations will be removed and disposed of at an approved upland location. Noise measurements of dredging activities are rare in the literature, but dredging is considered to be a low-impact activity for marine mammals, producing non-pulsed sound and being substantially quieter in terms of acoustic energy output than sources such as seismic airguns and impact pile driving. Noise produced by dredging operations has been compared to that produced by a commercial vessel travelling at modest speed (Robinson et al., 2011). Further discussion of dredging sound production may be found in the literature (*e.g.,* Richardson et al., 1995, Nedwell et al., 2008, Parvin et al., 2008, Ainslie et al., 2009). Generally, the effects of dredging on marine mammals are not expected to rise to the level of a take. As stated, take is highly unlikely and is not proposed to be authorized for dredging activities.

Pile Installation

A total of 28 permanent piles will be installed as part of this project. Four 24-inch concrete piles will be installed on land above the mean highwater (MHW) line, and the remaining piles will all be installed in-water as outlined in Table 1.

Concrete piles used for in-water construction of the pier structure for the Mission Bay Ferry Landing will involve the temporary installation of a steel caisson sleeve followed by drilling of the rock socket, with this installation and drilling process outlined below. Four 14-inch steel H piles will be driven with a vibratory driver to provide support for a 30-inch steel caisson sleeve, a large tubular steel pile. The steel sleeve will also be installed using a vibratory driver until refusal. Once the caisson is in place, sediment/soil/rock within the caisson will be drilled out using a Bauer BG18 drill or similar. All drilled sediment/soil/rock will be collected for disposal and transported to an appropriate permitted facility. The concrete piles are then inserted after the hole has been drilled. The 24-inch concrete piles will then be placed/seated in bedrock for grouting then the outer caisson and four H-piles will be pulled. Figure 3 in the IHA Application provides a depiction of this process. This method of construction creates less overall noise and turbidity during installation than driven piles. Drilling also is beneficial as it reduces the stress and therefore chance of breakage or damage to the pile during installation. Overall, ten 24-inch octagonal concrete piles will be driven using these methods, including down the hole drilling. Authorization of take by Level B harassment was requested and is proposed for authorization by NMFS for drilling activities associated with 24-inch concrete piles.

For the remaining piles, noise generated by vibratory and/or impact hammers is expected to result in the disturbance of marine mammals and, therefore, authorization of incidental take is proposed. Eight 36-inch steel piles for the MBFL guide piles and donut fenders and two 16-inch steel piles for the WTL platform will be installed with a combination of vibratory driver and/or impact hammer. The four remaining 20-inch square concrete piles to be installed in-water will be installed with an impact hammer.

The Port estimates a production rate for pile driving of two to six piles per day, resulting in a 15 days of pile driving and removal as outlined in Table 1. Piles installed using an impact hammer will use a Delmag D36/D46/D62 or similar diesel hammer. An overview of the sound source levels for this pile installation can be found in Table 3. It should be noted that the contractor will be instructed to implement vibratory installation as much as possible.

All pile driving will be performed in compliance with the ''U.S. Army Corps of Engineers Proposed Procedures for Permitting Projects that will Not Adversely Affect Selected Listed Species in California'' and the associated USFWS and NMFS section 7 consultation documents associated with these procedures.

TABLE 1—SUMMARY OF IN WATER PILE INSTALLATION

Locations	Project element	Pile diameter (inch)	Pile type	Number of piles	Method	Piles/day	Construction days
Debris Removal		12	Steel	12	If necessary, a vibratory hammer will be used to remove up to 12 piles 60–120 seconds/pile while pulling the pile up to loosen it from the sediment.	12	
MBFL	Pier	14 30 24	H-pile steel Steel caisson Octagonal concrete.	4 1 10	Four 14-inch steel H beams will be driven with Vibratory Driver 600 seconds/pile to support 30-inch steel caisson sleeve driven with Vibratory Driver (900 sec/pile) to refusal, drill out hole removing soils, place and position concrete pile, grout pile in place while simultaneously pulling the caisson.	4 1 1	10
	Float Guide Piles.	36	Steel	6	Vibratory Driver 1200 sec/pile then Impact Hammer last 15 ft (150 strikes/pile ~20 minutes); bubble curtain will be used during impact duration.	5	2
	Donut Fender Piles.	36	Steel	2	Vibratory Driver 1200 sec/pile then Impact Hammer last 15 ft (150 strikes/pile ~20 minutes); bubble curtain will be used during impact duration.	5	
WTL	Platform	16	Steel	2	Vibratory Driver 600 sec/pile then Impact Hammer last 15 ft (500 strikes/pile ~20 minutes); bubble curtain will be used during impact duration.	2	1
	Guide Piles	20	Square Concrete.	4	Impact Hammer 500 strikes/pile (max 20 minutes); if necessary bubble curtain will be used during impact duration.	4	1

Installation of Ferry Landing Structural Elements

Installation of the pier deck, pier canopy, float, and gangway would be conducted from land and water-based vessels. This work would include the use of generators, cranes, and other heavy equipment but is not expected to result in any harassment of marine mammals. Therefore, no take is requested or proposed for authorization for these activities.

Proposed mitigation, monitoring, and reporting measures are described in detail later in this document (please see *Proposed Mitigation* and *Proposed Monitoring and Reporting*).

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of the application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history, of the potentially affected species. Additional information regarding population trends and threats may be found in NMFS's Stock Assessment Reports (SAR; *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*) and more general information about these species (*e.g.,* physical and behavioral descriptions) may be found on NMFS's website (*https://www.fisheries.noaa.gov/find-species*).

Table 2 lists all species with expected potential for occurrence in the Mission Bay/Central Waterfront area of San Francisco Bay and summarizes information related to the population or stock, including regulatory status under the MMPA and ESA and potential biological removal (PBR), where known. For taxonomy, we follow the Committee on Taxonomy (2017). PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS's SARs). While NMFS neither anticipates nor proposes to authorize mortality here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS's stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS's U.S. 2017 SARs (Carretta *et al.,* 2017). All values presented in Table 2 are the most recent available at the time of publication and are available in the 2017 SARs (Carretta *et al.,* 2017).

Common name	Scientific name	Stock	ESA/MMPA status; strategic (Y/N) [1]	Stock abundance (CV, N_{min}, most recent abundance survey) [2]	PBR	Annual M/SI [3]
Order Cetartiodactyla—Cetacea—Superfamily Mysticeti (baleen whales)						
Family Eschrichtiidae						
Gray whale	*Eschrichtius robustus*	Eastern North Pacific	-/-; N	20,990 (0.05, 20,125, 2011).	624	132
Family Balaenopteridae (rorquals)						
Humpback whale	*Megaptera novaeangliae*	California/Oregon/Washington	E/D; Y	1,918 (0.03, 1,876, 2014)	11	>6.5
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						
Bottlenose dolphin	*Tursiops truncatus*	California Coastal	-/-; N	453 (0.06, 346, 2011)	2.7	>2
Family Phocoenidae (porpoises)						
Harbor porpoise	*Phocoena phocoena*	San Francisco-Russian River	-/-; N	9,886 (0.51, 6,625, 2011)	66	0
Order Carnivora—Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions)						
California sea lion	*Zalophus californianus*	U.S.	-/-; N	296,750 (n/a, 153,337, 2011).	9,200	389
Northern fur seal	*Callorhinus ursinus*	California	-/-; N	14,050 (n/a, 7,524, 2013)	451	1.8
		Eastern North Pacific	-/-; N	626,734 (n/a, 530,474, 2014).	11,405	1.1
Guadalupe fur seal	*Arctocephalus townsendi*	Mexico to California	T/D; Y	20,000 (n/a, 15,830, 2010).	542	>3.2
Family Phocidae (earless seals)						
Pacific harbor seal	*Phoca vitulina richardii*	California	-/-; N	30,968 (n/a, 27,348, 2012).	1,641	43
Northern elephant seal	*Mirounga angustirostris*	California Breeding	-/-; N	179,000 (n/a, 81,368, 2010).	4,882	8.8

[1] Endangered Species Act (ESA) status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

[2] NMFS marine mammal stock assessment reports online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*. CV is coefficient of variation; N_{min} is the minimum estimate of stock abundance. In some cases, CV is not applicable.

[3] These values, found in NMFSs SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (*e.g.,* commercial fisheries, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.

Note: Italicized species are not expected to be taken or proposed for authorization.

All species that could potentially occur in the Port's proposed project area in San Francisco Bay are included in Table 2. However, the temporal and/or spatial occurrence of humpback whale and Guadalupe fur seal is such that take is not expected to occur, and they are not discussed further beyond the explanation provided here. Humpback whales are rare visitors to the interior of San Francisco Bay. A recent, seasonal influx of humpback whales inside San

Francisco Bay near the Golden Gate was recorded from April to November in 2016 and 2017 (Keener 2017). The Golden Gate is outside of this project's action area and humpback whales are not expected to be present during the project. Guadalupe fur seals occasionally range into the waters of northern California and the Pacific Northwest. The Farallon Islands (off central California) and Channel Islands (off southern California) are used as haulouts during these movements (Simon 2016). Juvenile Guadalupe fur seals occasionally strand in the vicinity of San Francisco, especially during El Niño events. Most strandings along the California coast are animals younger than two years old, with evidence of malnutrition (NMFS 2017a). Because Guadalupe fur seals are highly rare in the area, and sightings are associated with abnormal weather conditions, such as El Niño events, NMFS has determined that no Guadalupe fur seals are likely to occur in the project vicinity and, therefore, no take is expected to occur.

Harbor Seal

Harbor seals are found from Baja California to the eastern Aleutian Islands of Alaska. The species primarily hauls out on remote mainland and island beaches and reefs, and estuary areas. Harbor seals tend to forage locally within 53 miles (mi) (85 kilometers (km)) of haul-out sites (Harvey and Goley 2011). Harbor seal is the most common marine mammal species observed in the Bay and individuals are commonly seen near the San Francisco-Oakland Bay Bridge east span (CalTrans 2013b, 2013c). Tagging studies have shown that most seals tagged in the Bay remain in the Bay (Harvey and Goley 2011; Manugian 2013). Foraging often occurs in the Bay, as noted by observations of seals exhibiting foraging behavior (short dives less than five minutes, moving back and forth in an area, and sometimes tearing up prey at the surface).

Gray Whale

Gray whales are large baleen whales. They grow to approximately 50 ft in length and weigh up to 40 tons. They are one of the most frequently seen whales along the California coast, easily recognized by their mottled gray color and lack of dorsal fin. Adult whales carry heavy loads of attached barnacles, which add to their mottled appearance. Gray whales are divided into the Eastern North Pacific and Western North Pacific stocks. Both stocks migrate each year along the west coast of continental North America and Alaska. The Eastern North Pacific stock is much larger and is more likely to occur in the San Francisco Bay area. Western North Pacific Gray whales have summer and fall feeding grounds in the Okhotsk Sea off northeast Sakhalin Island, Russia, and off southeastern Kamchatka in the Bering Sea (NMFS 2017c), so they would not be expected to occur in San Francisco Bay during construction activity for this project. With the exception of an unusual mortality event in 1999 and 2000, the population of Eastern North Pacific stock has increased over the last 20 years and has been stable since the 1990s (NMFS 2015c).

Gray whales are the only baleen whale known to feed on the sea floor, where they scoop up bottom sediments to filter out benthic crustaceans, mollusks, and worms (NMFS 2015c). They feed in northern waters primarily off the Bering, Chukchi, and western Beaufort Seas during the summer. Between December and January, late-stage pregnant females, adult males, and immature females and males migrate southward to breeding areas around Mexico. The northward migration occurs between February and March. Coastal waters just outside San Francisco Bay are considered a migratory Biologically Important Area for the northward progression of gray whales (Calambokidis *et al.,* 2015). During this time, recently pregnant females, adult males, immature females, and females with calves move north to the feeding grounds (Calambokidis *et al.,* 2014). A few individuals enter into the San Francisco Bay during their northward migration.

Bottlenose Dolphins

Bottlenose dolphins are distributed world-wide in tropical and warm-temperate waters. In many regions, including California, separate coastal and offshore populations are known (Walker 1981; Ross and Cockcroft 1990; Van Waerebeek *et al.* 1990). The California coastal stock of bottlenose dolphins is distinct from the offshore stock, based on significant differences in genetics and cranial morphology (Perrin *et al.* 2011, Lowther-Thielking *et al.* 2015). California coastal bottlenose dolphins are found within about one km of shore (Hansen, 1990; Carretta *et al.* 1998; Defran and Weller 1999) with the range extending north over the last several decades related to El Niño events and increased ocean temperatures. As the range of bottlenose dolphins extended north, dolphins began entering the Bay in 2010 (Szczepaniak 2013). Until 2016, most bottlenose dolphins in San Francisco Bay were observed in the western Bay, from the Golden Gate Bridge to Oyster Point and Redwood City (Perlman 2017).

Harbor Porpoise

Harbor porpoise are seldom found in waters warmer than 62.6 degrees Fahrenheit (17 degrees Celsius) (Read 1990) or south of Point Conception, and occurs as far north as the Bering Sea (Barlow and Hanan 1995; Carretta *et al.,* 2017). The San Francisco-Russian River stock is found from Pescadero, 18 mi (30 km) south of the Bay, to 99 mi (160 km) north of the Bay at Point Arena (Carretta *et al.,* 2017). In most areas, harbor porpoise occurs in small groups, consisting of just a few individuals.

Occasional sightings of harbor porpoises in the Bay, including near the Yerba Buena Island harbor seal haul-out site, were reported by the Caltrans marine mammal monitoring program beginning in 2008 (Caltrans 2018). Continued sightings from Caltrans and the Golden Gate Cetacean Research (GGCR) Organization suggests that the species is returning to San Francisco Bay after an absence of approximately 65 years (GGCR 2010). This re-immergence is not unique to San Francisco Bay, but rather indicative of the harbor porpoise in general along the west coast. GGCR has been issued a scientific research permit from NMFS for a multi-year assessment to document the population abundance and distribution in the Bay (82 FR 60374). Recent observations of harbor porpoises have been reported by GGCR researchers off Cavallo Point, outside Raccoon Strait between Tiburon and Angel Island, off Fort Point and as far into the Bay as Carquinez Strait (Perlman 2010). Based on the Caltrans and GGCR monitoring, over 100 porpoises were seen at one time entering San Francisco Bay; and over 600 individual animals have been documented in a photo-ID database. Reported sightings are concentrated in the vicinity of the Golden Gate Bridge and Angel Island, with lesser numbers sighted south of Alcatraz and west of Treasure Island (AECOM 2017).

California Sea Lion

California sea lions breed on the offshore islands of California from May through July (Heath and Perrin 2009). During the non-breeding season, adult and sub-adult males and juveniles migrate northward along the coast, to central and northern California, Oregon, Washington, and Vancouver Island (Jefferson *et al.,* 1993). They return south the following spring (Lowry and Forney 2005; Heath and Perrin 2009). Females and some juveniles tend to remain closer to rookeries (Antonelis *et al.,* 1990; Melin *et al.,* 2008).

In San Francisco Bay, California sea lions have been observed at Angel Island and occupying the docks near Pier 39 which is the largest California sea lion haul-out in San Francisco Bay. A maximum of 1,706 sea lions were counted at Pier 39 in 2009. However, since then the population has averaged at about 50–300 depending upon the season (TMMC 2017). This group of sea lions has decreased in size in recent years, coincident with a fluctuating decrease in the herring population in the Bay. There are no known breeding sites within San Francisco Bay. Their primary breeding site is in the Channel Islands (USACE 2011). The sea lions appear at Pier 39 after returning from the Channel Islands at the beginning of August (Bauer 1999). No other sea lion haul-out sites have been identified in the Bay and no pupping has been observed at the Pier 39 site or any other site in San Francisco Bay under normal conditions (USACE 2011). Although there has been documentation of pupping on docks in the Bay, this event was during a domoic acid event. The Port does not anticipate that any domoic events will occur during the project construction activities.

The project site is approximately four miles away from Pier 39. Although there is little information regarding the foraging behavior of the California sea lion in southern San Francisco Bay, they have been observed foraging on a regular basis in the shipping channel south of Yerba Buena Island.

Foraging grounds have also been identified for pinnipeds, including sea lions, between Yerba Buena Island and Treasure Island, as well as off the Tiburon Peninsula (Caltrans, 2006). The California sea lions that use the Pier 39 haul-out site may be feeding on Pacific herring (*Clupea harengus*), northern anchovy, and other prey in the waters of San Francisco Bay (Caltrans, 2013a). In addition to the Pier 39 haul-out, California sea lions haul out on buoys and similar structures throughout San Francisco Bay. They mainly are seen swimming off the San Francisco and Marin shorelines within San Francisco Bay, but may occasionally enter the project area to forage.

Northern Elephant Seal

Northern elephant seal is common on California coastal mainland and island sites, where the species pups, breeds, rests, and molts. The largest rookeries are on San Nicolas and San Miguel islands in the northern Channel Islands. Near the Bay, elephant seals breed, molt, and haul out at Año Nuevo Island, the Farallon Islands, and Point Reyes National Seashore.

Northern elephant seals haul out to give birth and breed from December through March. Pups remain onshore or in adjacent shallow water through May. Both sexes make two foraging migrations each year: One after breeding and the second after molting (Stewart 1989; Stewart and DeLong 1995). Adult females migrate to the central North Pacific to forage, and males migrate to the Gulf of Alaska to forage (Robinson *et al.* 2012). Pup mortality is high when they make the first trip to sea in May, and this period correlates with the time of most strandings. Pups of the year return in the late summer and fall, to haul out at breeding rookery and small haul out sites, but occasionally they may make brief stops in the Bay.

Generally, only juvenile elephant seals enter the Bay and do not remain long. The most recent sighting near the project area was in 2012, on the beach at Clipper Cove on Treasure Island, when a healthy yearling elephant seal hauled out for approximately 1 day. Approximately 100 juvenile northern elephant seals strand in or near the Bay each year, including individual strandings at Yerba Buena Island (YBI) and Treasure Island (less than 10 strandings per year).

Northern Fur Seal

Northern fur seal breeds on the offshore islands of California and in the Bering Sea from May through July. Two stocks of Northern fur seals may occur near the Bay, the California and Eastern Pacific stocks. The California stock breeds, pups, and forages off the California coast. The Eastern Pacific stock breeds and pups on islands in the Bering Sea, but females and juveniles move south to California waters to forage in the fall and winter months.

Both the California and Eastern Pacific stocks forage in the offshore waters of California, but only sick, emaciated, or injured fur seals enter the Bay. The Marine Mammal Center (TMMC) occasionally picks up stranded fur seals around YBI and Treasure Island.

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Current data indicate that not all marine mammal species have equal hearing capabilities (*e.g.,* Richardson *et al.,* 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007) recommended that marine mammals be divided into functional hearing groups based on directly measured or estimated hearing ranges on the basis of available behavioral response data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. Note that no direct measurements of hearing ability have been successfully completed for mysticetes (*i.e.,* low-frequency cetaceans). Subsequently, NMFS (2018) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 dB threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. The functional groups and the associated frequencies are indicated below (note that these frequency ranges correspond to the range for the composite group, with the entire range not necessarily reflecting the capabilities of every species within that group):

- Low-frequency cetaceans (mysticetes): Generalized hearing is estimated to occur between approximately 7 Hz and 35 kHz;
- Mid-frequency cetaceans (larger toothed whales, beaked whales, and most delphinids): Generalized hearing is estimated to occur between approximately 150 Hz and 160 kHz;
- High-frequency cetaceans (porpoises, river dolphins, and members of the genera Kogia and Cephalorhynchus; including two members of the genus Lagenorhynchus, on the basis of recent echolocation data and genetic data): Generalized hearing is estimated to occur between approximately 275 Hz and 160 kHz.
- Pinnipeds in water; Phocidae (true seals): Generalized hearing is estimated to occur between approximately 50 Hz to 86 kHz;
- Pinnipeds in water; Otariidae (eared seals): Generalized hearing is estimated to occur between 60 Hz and 39 kHz.

The pinniped functional hearing group was modified from Southall *et al.* (2007) on the basis of data indicating that phocid species have consistently demonstrated an extended frequency range of hearing compared to otariids, especially in the higher frequency range (Hemilä *et al.,* 2006; Kastelein *et al.,* 2009; Reichmuth and Holt, 2013).

For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information. Seven marine mammal species (three cetacean and four pinniped (two otariid and two phocid) species) have the reasonable potential to co-occur with the proposed survey activities. Please refer to Table 2. Of the cetacean species that may be present, the gray whale is classified as a low-frequency cetacean, the bottlenose dolphin is classified as a mid-frequency cetacean, and the harbor porpoise is classified as a high-frequency cetacean.

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

This section includes a summary and discussion of the ways that components of the specified activity may impact marine mammals and their habitat. The ''Estimated Take'' section later in this document includes a quantitative analysis of the number of individuals that are expected to be taken by this activity. The ''Negligible Impact Analysis and Determination'' section considers the content of this section, the ''Estimated Take'' section, and the ''Proposed Mitigation'' section, to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and how those impacts on individuals are likely to impact marine mammal species or stocks.

Description of Sound

Sound travels in waves, the basic components of which are frequency, wavelength, velocity, and amplitude. Frequency is the number of pressure waves that pass by a reference point per unit of time and is measured in Hz or cycles per second. Wavelength is the distance between two peaks of a sound wave; lower frequency sounds have longer wavelengths than higher frequency sounds. Amplitude is the height of the sound pressure wave or the 'loudness' of a sound and is typically measured using the dB scale. A dB is the ratio between a measured pressure (with sound) and a reference pressure (sound at a constant pressure, established by scientific standards). It is a logarithmic unit that accounts for large variations in amplitude; therefore, relatively small changes in dB ratings correspond to large changes in sound pressure. When referring to sound pressure levels (SPLs; the sound force per unit area), sound is referenced in the context of underwater sound pressure to one microPascal (μPa). One pascal is the pressure resulting from a force of one newton exerted over an area of one square meter (m^2). The source level (SL) represents the sound level at a distance of 1 m from the source (referenced to 1 μPa). The received level is the sound level at the listener's position. Note that all underwater sound levels in this document are referenced to a pressure of 1 μPa and all airborne sound levels in this document are referenced to a pressure of 20 μPa.

Root mean square (rms) is the quadratic mean sound pressure over the duration of an impulse. Rms is calculated by squaring all of the sound amplitudes, averaging the squares, and then taking the square root of the average (Urick 1983). Rms accounts for both positive and negative values; squaring the pressures makes all values positive so that they may be accounted for in the summation of pressure levels (Hastings and Popper 2005). This measurement is often used in the context of discussing behavioral effects, in part because behavioral effects, which often result from auditory cues, may be better expressed through averaged units than by peak pressures.

When underwater objects vibrate or activity occurs, sound-pressure waves are created. These waves alternately compress and decompress the water as the sound wave travels. Underwater sound waves radiate in all directions away from the source (similar to ripples on the surface of a pond), except in cases where the source is directional. The compressions and decompressions associated with sound waves are detected as changes in pressure by aquatic life and man-made sound receptors such as hydrophones.

Even in the absence of sound from the specified activity, the underwater environment is typically loud due to ambient sound. Ambient sound is defined as environmental background sound levels lacking a single source or point (Richardson *et al.,* 1995), and the sound level of a region is defined by the total acoustical energy being generated by known and unknown sources. These sources may include physical (*e.g.,* waves, earthquakes, ice, atmospheric sound), biological (*e.g.,* sounds produced by marine mammals, fish, and invertebrates), and anthropogenic sound (*e.g.,* vessels, dredging, aircraft, construction). A number of sources contribute to ambient sound, including the following (Richardson *et al.,* 1995):

- *Wind and waves:* The complex interactions between wind and water surface, including processes such as breaking waves and wave-induced bubble oscillations and cavitation, are a main source of naturally occurring ambient noise for frequencies between 200 Hz and 50 kilohertz (kHz) (Mitson 1995). In general, ambient sound levels tend to increase with increasing wind speed and wave height. Surf noise becomes important near shore, with measurements collected at a distance of 8.5 km from shore showing an increase of 10 dB in the 100 to 700 Hz band during heavy surf conditions.
- *Precipitation:* Sound from rain and hail impacting the water surface can become an important component of total noise at frequencies above 500 Hz, and possibly down to 100 Hz during quiet times.
- *Biological:* Marine mammals can contribute significantly to ambient noise levels, as can some fish and shrimp. The frequency band for biological contributions is from approximately 12 Hz to over 100 kHz.
- *Anthropogenic:* Sources of ambient noise related to human activity include transportation (surface vessels and aircraft), dredging and construction, oil and gas drilling and production, seismic surveys, sonar, explosions, and ocean acoustic studies. Shipping noise typically dominates the total ambient noise for frequencies between 20 and 300 Hz. In general, the frequencies of anthropogenic sounds are below 1 kHz and, if higher frequency sound levels are created, they attenuate rapidly (Richardson *et al.,* 1995). Sound from identifiable anthropogenic sources other than the activity of interest (*e.g.,* a passing vessel) is sometimes termed background sound, as opposed to ambient sound.

The sum of the various natural and anthropogenic sound sources at any given location and time—which comprise ''ambient'' or ''background'' sound—depends not only on the source levels (as determined by current weather conditions and levels of biological and shipping activity) but also on the ability of sound to propagate through the environment. In turn, sound propagation is dependent on the spatially and temporally varying properties of the water column and sea floor, and is frequency-dependent. As a result of the dependence on a large number of varying factors, ambient sound levels can be expected to vary widely over both coarse and fine spatial and temporal scales. Sound levels at a given frequency and location can vary by 10–20 dB from day to day (Richardson *et al.,* 1995). The result is that, depending on the source type and its intensity, sound from the specified activity may be a negligible addition to the local environment or could form a distinctive signal that may affect marine mammals.

Description of Sound Sources

In-water construction activities associated with the project would include impact pile driving, vibratory pile driving, vibratory pile removal, and down the hole drilling. The sounds produced by these activities fall into one of two general sound types: Impulsive and non-impulsive (defined in the following). The distinction between these two sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (*e.g.,* Ward 1997 in Southall *et al.,* 2007). Please see Southall *et al.* (2007) for an in-depth discussion of these concepts.

Impulsive sound sources (*e.g.,* explosions, gunshots, sonic booms, impact pile driving) produce signals that are brief (typically considered to be less than one second), broadband, atonal transients (ANSI 1986; Harris 1998; NIOSH 1998; ISO 2003; ANSI 2005) and occur either as isolated events or repeated in some succession. Impulsive sounds are all characterized by a relatively rapid rise from ambient pressure to a maximal pressure value followed by a rapid decay period that may include a period of diminishing, oscillating maximal and minimal pressures, and generally have an increased capacity to induce physical injury as compared with sounds that lack these features.

Non-impulsive sounds can be tonal, narrowband, or broadband, brief or prolonged, and may be either continuous or non-continuous (NIOSH 1998). Some of these non-impulsive sounds can be transient signals of short duration but without the essential properties of impulses (*e.g.,* rapid rise time). Examples of non-impulsive sounds include those produced by vessels, aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems. The duration of such sounds, as received at a distance, can be greatly extended in a highly reverberant environment.

Impact hammers operate by repeatedly dropping a heavy piston onto a pile to drive the pile into the substrate. Sound generated by impact hammers is characterized by rapid rise times and high peak levels, a potentially injurious combination (Hastings and Popper 2005). Vibratory hammers install piles by vibrating them and allowing the weight of the hammer to push them into the sediment. Vibratory hammers produce significantly less sound than impact hammers. Peak SPLs may be 180 dB or greater, but are generally 10 to 20 dB lower than SPLs generated during impact pile driving of the same-sized pile (Oestman *et al.,* 2009). Rise time is slower, reducing the probability and severity of injury, and sound energy is distributed over a greater amount of time (Nedwell and Edwards 2002; Carlson *et al.,* 2005).

Acoustic Impacts

Anthropogenic sounds cover a broad range of frequencies and sound levels and can have a range of highly variable impacts on marine life, from none or minor to potentially severe responses, depending on received levels, duration of exposure, behavioral context, and various other factors. The potential effects of underwater sound from active acoustic sources can potentially result in one or more of the following direct impacts on marine mammals; temporary or permanent hearing impairment, non-auditory physical or physiological effects, behavioral disturbance, stress, and masking (Richardson *et al.,* 1995; Gordon *et al.,* 2004; Nowacek *et al.,* 2007; Southall *et al.,* 2007; Gotz *et al.,* 2009). The degree of effect is intrinsically related to the signal characteristics, received level, distance from the source, and duration of the sound exposure. In general, sudden, high level sounds can cause hearing loss, as can longer exposures to lower level sounds. Temporary or permanent loss of hearing will occur almost exclusively for noise within an animal's hearing range. We first describe specific manifestations of acoustic effects before providing discussion specific to the Port of San Fancisco's construction activities.

Richardson *et al.* (1995) described zones of increasing intensity of effect that might be expected to occur, in relation to distance from a source and assuming that the signal is within an animal's hearing range. First is the area within which the acoustic signal would be audible (potentially perceived) to the animal, but not strong enough to elicit any overt behavioral or physiological response. The next zone corresponds with the area where the signal is audible to the animal and of sufficient intensity to elicit behavioral or physiological responsiveness. Third is a zone within which, for signals of high intensity, the received level is sufficient to potentially cause discomfort or tissue damage to auditory or other systems. Overlaying these zones to a certain extent is the area within which masking (*i.e.,* when a sound interferes with or masks the ability of an animal to detect a signal of interest that is above the absolute hearing threshold) may occur; the masking zone may be highly variable in size.

We describe the more severe effects (*i.e.,* permanent hearing impairment, certain non-auditory physical or physiological effects) only briefly as we do not expect that there is a reasonable likelihood that the Port of San Francisco's activities may result in such effects (see below for further discussion). Marine mammals exposed to high-intensity sound, or to lower-intensity sound for prolonged periods, can experience hearing threshold shift (TS), which is the loss of hearing sensitivity at certain frequency ranges (Kastak *et al.,* 1999; Schlundt *et al.,* 2000; Finneran *et al.,* 2002, 2005). TS can be permanent (PTS), in which case the loss of hearing sensitivity is not fully recoverable, or temporary (TTS), in which case the animal's hearing threshold would recover over time (Southall *et al.,* 2007). Repeated sound exposure that leads to TTS could cause PTS. In severe cases of PTS, there can be total or partial deafness, while in most cases the animal has an impaired ability to hear sounds in specific frequency ranges (Kryter 1985).

When PTS occurs, there is physical damage to the sound receptors in the ear (*i.e.,* tissue damage), whereas TTS represents primarily tissue fatigue and is reversible (Southall *et al.,* 2007). In addition, other investigators have suggested that TTS is within the normal bounds of physiological variability and tolerance and does not represent physical injury (*e.g.,* Ward 1997). Therefore, NMFS does not consider TTS to constitute auditory injury.

Relationships between TTS and PTS thresholds have not been studied in marine mammals—PTS data exists only for a single harbor seal (Kastak *et al.,* 2008)—but are assumed to be similar to those in humans and other terrestrial mammals. PTS typically occurs at exposure levels at least several dB above a 40-dB threshold shift approximates PTS onset; *e.g.,* Kryter *et al.,* 1966; Miller, 1974 found that inducing mild TTS (a 6-dB threshold shift) approximates TTS onset (*e.g.,* Southall *et al.,* 2007). Based on data from terrestrial mammals, a precautionary assumption is that the PTS thresholds for impulsive sounds (such as impact pile driving sounds received close to the source) are at least 6 dB higher than the TTS threshold on a peak-pressure basis and PTS cumulative sound exposure level thresholds are 15 to 20 dB higher than TTS cumulative sound exposure level thresholds (Southall *et al.,* 2007). Given the higher level of sound or longer exposure duration necessary to cause PTS as compared with TTS, it is considerably less likely that PTS could occur.

TTS is the mildest form of hearing impairment that can occur during exposure to sound (Kryter 1985). While experiencing TTS, the hearing threshold rises, and a sound must be at a higher level in order to be heard. In terrestrial and marine mammals, TTS can last from minutes or hours to days (in cases of strong TTS). In many cases, hearing sensitivity recovers rapidly after exposure to the sound ends. Few data on sound levels and durations necessary to elicit mild TTS have been obtained for marine mammals.

Marine mammal hearing plays a critical role in communication with conspecifics, and interpretation of environmental cues for purposes such as predator avoidance and prey capture. Depending on the degree (elevation of threshold in dB), duration (*i.e.,* recovery time), and frequency range of TTS, and the context in which it is experienced, TTS can have effects on marine mammals ranging from discountable to serious. For example, a marine mammal may be able to readily compensate for a brief, relatively small amount of TTS in a non-critical frequency range that occurs during a time where ambient noise is lower and there are not as many competing sounds present. Alternatively, a larger amount and longer duration of TTS sustained during a time when communication is critical for successful mother/calf interactions could have more serious impacts.

Currently, TTS data only exist for four species of cetaceans (bottlenose dolphin (*Tursiops truncatus*), beluga whale (*Delphinapterus leucas*), harbor porpoise, and Yangtze finless porpoise (*Neophocoena asiaeorientalis*) and three species of pinnipeds (northern elephant seal, harbor seal, and California sea lion) exposed to a limited number of sound sources (*i.e.,* mostly tones and octave-band noise) in laboratory settings (*e.g.,* Finneran *et al.,* 2002; Nachtigall *et al.,* 2004; Kastak *et al.,* 2005; Lucke *et al.,* 2009; Popov *et al.,* 2011). In general, harbor seals (Kastak *et al.,* 2005; Kastelein *et al.,* 2012a) and harbor porpoises (Lucke *et al.,* 2009; Kastelein *et al.,* 2012b) have a lower TTS onset than other measured pinniped or cetacean species. Additionally, the existing marine mammal TTS data come from a limited number of individuals within these species. There are no data available on noise-induced hearing loss for mysticetes. For summaries of data on TTS in marine mammals or for further discussion of TTS onset thresholds, please see Finneran (2015).

In addition to PTS and TTS, there is a potential for non-auditory physiological effects or injuries that theoretically might occur in marine mammals exposed to high level underwater sound or as a secondary effect of extreme behavioral reactions (*e.g.,* change in dive profile as a result of an avoidance reaction) caused by exposure to sound. These impacts can include neurological effects, bubble formation, resonance effects, and other types of organ or tissue damage (Cox *et al.,* 2006; Southall *et al.,* 2007; Zimmer and Tyack 2007). The Port of San Francisco's activities do not involve the use of devices such as explosives or mid-frequency active sonar that are associated with these types of effects. These impacts are not anticipated to occur as a result of the Port's work and are not discussed further.

When a live or dead marine mammal swims or floats onto shore and is incapable of returning to sea, the event is termed a ''stranding'' (16 U.S.C. 1421h(3)). Marine mammals are known to strand for a variety of reasons, such as infectious agents, biotoxicosis, starvation, fishery interaction, ship strike, unusual oceanographic or weather events, sound exposure, or combinations of these stressors sustained concurrently or in series (*e.g.,* Geraci *et al.,* 1999). However, the cause or causes of most strandings are unknown (*e.g.,* Best 1982). Combinations of dissimilar stressors may combine to kill an animal or dramatically reduce its fitness, even though one exposure without the other would not be expected to produce the same outcome (*e.g.,* Sih *et al.,* 2004). For further description of stranding events see, *e.g.,* Southall *et al.,* 2006; Jepson *et al.,* 2013; Wright *et al.,* 2013.

Behavioral Effects

Behavioral disturbance may include a variety of effects, including subtle changes in behavior (*e.g.,* minor or brief avoidance of an area or changes in vocalizations), more conspicuous changes in similar behavioral activities, and more sustained and/or potentially severe reactions, such as displacement from or abandonment of high-quality habitat. Behavioral responses to sound are highly variable and context-specific and any reactions depend on numerous intrinsic and extrinsic factors (*e.g.,* species, state of maturity, experience, current activity, reproductive state, auditory sensitivity, time of day), as well as the interplay between factors (*e.g.,* Richardson *et al.,* 1995; Wartzok *et al.,* 2003; Southall *et al.,* 2007; Weilgart, 2007; Archer *et al.,* 2010). Behavioral reactions can vary not only among individuals but also within an individual, depending on previous experience with a sound source, context, and numerous other factors (Ellison *et al.,* 2012), and can vary depending on characteristics associated with the sound source (*e.g.,* whether it is moving or stationary, number of sources, distance from the source). Please see Appendices B–C of Southall *et al.* (2007) for a review of studies involving marine mammal behavioral responses to sound.

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. It is important to note that habituation is appropriately considered as a ''progressive reduction in response to stimuli that are perceived as neither aversive nor beneficial,'' rather than as, more generally, moderation in response to human disturbance (Bejder *et al.,* 2009). 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. As noted, behavioral state may affect the type of response. For example, animals that are resting may show greater behavioral change in response to disturbing sound levels than animals that are highly motivated to remain in an area for feeding (Richardson *et al.,* 1995; NRC 2003; Wartzok *et al.,* 2003). Controlled experiments with captive marine mammals have 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-impulsive sound sources (typically seismic airguns or acoustic harassment devices) have been varied but often consist of avoidance behavior or other behavioral changes suggesting discomfort (Morton and Symonds 2002; see also Richardson *et al.,* 1995; Nowacek *et al.,* 2007).

Available studies show wide variation in response to underwater sound; therefore, it is difficult to predict specifically how any given sound in a particular instance might affect marine mammals perceiving the signal. If a marine mammal does react briefly to an underwater sound by changing its behavior or moving a small distance, the impacts of the change are unlikely to be significant to the individual, let alone the stock or population. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on individuals and populations could be significant (*e.g.,* Lusseau and Bejder 2007; Weilgart 2007; NRC 2005). However, there are broad categories of potential response, which we describe in greater detail here, that include alteration of dive behavior, alteration of foraging behavior, effects to breathing, interference with or alteration of vocalization, avoidance, and flight.

Changes in dive behavior can vary widely, and may consist of increased or decreased dive times and surface intervals as well as changes in the rates of ascent and descent during a dive (*e.g.,* Frankel and Clark 2000; Costa *et al.,* 2003; Ng and Leung 2003; Nowacek *et al.,* 2004; Goldbogen *et al.,* 2013a,b). Variations in dive behavior may reflect interruptions in biologically significant activities (*e.g.,* foraging) or they may be of little biological significance. The impact of an alteration to dive behavior resulting from an acoustic exposure depends on what the animal is doing at the time of the exposure and the type and magnitude of the response.

Disruption of feeding behavior can be difficult to correlate with anthropogenic sound exposure, so it is usually inferred by observed displacement from known foraging areas, the appearance of secondary indicators (*e.g.,* bubble nets or sediment plumes), or changes in dive behavior. As for other types of behavioral response, the frequency, duration, and temporal pattern of signal presentation, as well as differences in species sensitivity, are likely contributing factors to differences in response in any given circumstance (*e.g.,* Croll *et al.,* 2001; Nowacek *et al.;* 2004; Madsen *et al.,* 2006; Yazvenko *et al.,* 2007). A determination of whether foraging disruptions incur fitness consequences would require information on or estimates of the energetic requirements of the affected individuals and the relationship between prey availability, foraging effort and success, and the life history stage of the animal.

Variations in respiration naturally occur with different behaviors and alterations to breathing rate as a function of acoustic exposure can be expected to co-occur with other behavioral reactions, such as a flight response or an alteration in diving. However, respiration rates in and of themselves may be representative of annoyance or an acute stress response. Various studies have shown that respiration rates may either be unaffected or could increase, depending on the species and signal characteristics, again highlighting the importance in understanding species differences in the tolerance of underwater noise when determining the potential for impacts resulting from anthropogenic sound exposure (*e.g.,* Kastelein *et al.,* 2001, 2005, 2006; Gailey *et al.,* 2007).

Marine mammals vocalize for different purposes and across multiple modes, such as whistling, echolocation click production, calling, and singing. Changes in vocalization behavior in response to anthropogenic noise can occur for any of these modes and may result from a need to compete with an increase in background noise or may reflect increased vigilance or a startle response. For example, in the presence of potentially masking signals, humpback whales and killer whales have been observed to increase the length of their songs (Miller *et al.,* 2000; Fristrup *et al.,* 2003; Foote *et al.,* 2004), while right whales (*Eubalaena glacialis*) have been observed to shift the frequency content of their calls upward while reducing the rate of calling in areas of increased anthropogenic noise (Parks *et al.,* 2007). In some cases, animals may cease sound production during production of aversive signals (Bowles *et al.,* 1994).

Avoidance is the displacement of an individual from an area or migration path because of the presence of a sound or other stressors, and is one of the most obvious manifestations of disturbance in marine mammals (Richardson *et al.,* 1995). For example, gray whales are known to change direction—deflecting from customary migratory paths—in order to avoid noise from seismic surveys (Malme *et al.,* 1984). Avoidance may be short-term, with animals returning to the area once the noise has ceased (*e.g.,* Bowles *et al.,* 1994; Goold, 1996; Stone *et al.,* 2000; Morton and Symonds, 2002; Gailey *et al.,* 2007). Longer-term displacement is possible, however, which may lead to changes in abundance or distribution patterns of the affected species in the affected region if habituation to the presence of the sound does not occur (*e.g.,* Blackwell *et al.,* 2004; Bejder *et al.,* 2006; Teilmann *et al.,* 2006).

A flight response is a dramatic change in normal movement to a directed and rapid movement away from the perceived location of a sound source. The flight response differs from other avoidance responses in the intensity of the response (*e.g.,* directed movement, rate of travel). Relatively little information on flight responses of marine mammals to anthropogenic signals exist, although observations of flight responses to the presence of predators have occurred (Connor and Heithaus 1996). The result of a flight response could range from brief, temporary exertion and displacement from the area where the signal provokes flight to, in extreme cases, marine mammal strandings (Evans and England 2001). However, it should be noted that response to a perceived predator does not necessarily invoke flight (Ford and Reeves 2008), and whether individuals are solitary or in groups may influence the response.

Behavioral disturbance can also impact marine mammals in more subtle ways. Increased vigilance may result in costs related to diversion of focus and attention (*i.e.,* when a response consists of increased vigilance, it may come at the cost of decreased attention to other critical behaviors such as foraging or resting). These effects have generally not been demonstrated for marine mammals, but studies involving fish and terrestrial animals have shown that increased vigilance may substantially reduce feeding rates (*e.g.,* Beauchamp and Livoreil 1997; Fritz *et al.,* 2002; Purser and Radford 2011). In addition, chronic disturbance can cause population declines through reduction of fitness (*e.g.,* decline in body condition) and subsequent reduction in reproductive success, survival, or both (*e.g.,* Harrington and Veitch, 1992; Daan *et al.,* 1996; Bradshaw *et al.,* 1998). However, Ridgway *et al.* (2006) reported that increased vigilance in bottlenose dolphins exposed to sound over a five-day period did not cause any sleep deprivation or stress effects.

Many animals perform vital functions, such as feeding, resting, traveling, and socializing, on a diel cycle (24-hour cycle). Disruption of such functions resulting from reactions to stressors such as sound exposure are more likely to be significant if they last more than one diel cycle or recur on subsequent days (Southall *et al.,* 2007). Consequently, a behavioral response lasting less than one day and not recurring on subsequent days is not considered particularly severe unless it could directly affect reproduction or survival (Southall *et al.,* 2007). Note that there is a difference between multi-day substantive behavioral reactions and multi-day anthropogenic activities. For example, just because an activity lasts for multiple days does not necessarily mean that individual animals are either exposed to activity-related stressors for multiple days or, further, exposed in a manner resulting in sustained multi-day substantive behavioral responses.

Behavioral Effects of the Port's Activities (Pile Driving and Drilling)

In the absence of mitigation, impacts to marine species could be expected to include physiological and behavioral responses to the acoustic signature (Viada *et al.,* 2008). Potential effects from impulsive sound sources like pile driving can range in severity from effects such as behavioral disturbance to temporary or permanent hearing impairment (Yelverton *et al.,* 1973). Due to the nature of the pile driving sounds in the project, behavioral disturbance is the most likely effect from the proposed activity. Marine mammals exposed to high intensity sound repeatedly or for prolonged periods can experience hearing threshold shifts. PTS constitutes injury, but TTS does not (Southall *et al.,* 2007). Based on the nature of the Port's activity and the anticipated effectiveness of the mitigation measures (*i.e.,* use of a bubble curtain, wood cushion, and shutdown—discussed in detail below in the Proposed Mitigation section), PTS is not anticipated. Therefore, the Port is not requesting and NMFS is not proposing to authorize take by Level A harassment related to this project.

The effects of sounds from pile driving, by impact or vibratory means, pile removal, and down the hole drilling might include one or more of the following: Temporary or permanent hearing impairment, non-auditory physical or physiological effects, behavioral disturbance, and masking (Richardson *et al.,* 1995; Gordon *et al.,* 2003; Nowacek *et al.,* 2007; Southall *et al.,* 2007). The effects of pile driving and drilling on marine mammals are dependent on several factors, including the type and depth of the animal; the pile size and type, and the intensity and duration of the pile driving sound; the substrate; the standoff distance between the pile and the animal; and the sound propagation properties of the environment. Impacts to marine mammals from pile driving and pile removal activities are expected to result primarily from acoustic pathways. As such, the degree of effect is intrinsically related to the frequency, 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. In addition, substrates that are soft (*e.g.,* sand) would absorb or attenuate the sound more readily than hard substrates (*e.g.,* rock), which may reflect the acoustic wave.

Responses to continuous sound, such as vibratory pile installation or down the hole drilling, have not been documented as well as responses to impulsive sounds. With both types of pile driving, it is likely that the onset of pile driving could result in temporary, short-term changes in an animal's typical behavior and/or avoidance of the affected area. These behavioral changes may include, based on more general observations of behavioral responses to sound exposure (Richardson *et al.,* 1995): Changing durations of surfacing and dives, number of blows per surfacing, or moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping); avoidance of areas where sound sources are located; and/or flight responses (*e.g.,* pinnipeds flushing into water from haulouts or rookeries). Pinnipeds may increase their haul-out time, possibly to avoid in-water disturbance (Thorson and Reyff 2006). If a marine mammal responds to a stimulus by changing its behavior (*e.g.,* through relatively minor changes in locomotion direction/speed or vocalization behavior), the response may or may not constitute taking at the individual level, and is unlikely to affect the stock or the species as a whole. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on animals, and if so potentially on the stock or species, could potentially be significant (*e.g.,* Lusseau and Bejder 2007; Weilgart 2007).

Natural and artificial sounds can disrupt behavior by masking. The frequency range of the potentially masking sound is important in determining any potential behavioral impacts. Because sound generated from in-water pile driving and removal is mostly concentrated at low-frequency ranges, it may have less effect on high frequency echolocation sounds made by porpoises. The most intense underwater sounds in the Port's 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 marine mammals present in the project area. Impact pile driving activity is relatively short-term, with rapid impulsive sounds occurring for approximately 20 minutes per pile in this project. The probability for impact pile driving resulting from this proposed action masking acoustic signals important to the behavior and survival of marine mammal species is low and if it occurred, it would be for a short duration. Vibratory pile driving is also relatively short-term, with rapid oscillations occurring for approximately 20 minutes per pile in this project. It is possible that vibratory pile driving resulting from this proposed action may mask acoustic signals important to the behavior and survival of marine mammal species, but the short-term duration and limited affected area would result in insignificant impacts from masking.

Pinnipeds that occur near the project site could be exposed to airborne sounds associated with pile driving and removal that have the potential to cause behavioral harassment, depending on their distance from pile driving activities. Cetaceans are not expected to be exposed to airborne sounds that would result in harassment as defined under the MMPA.

Airborne noise will primarily be an issue for pinnipeds that are swimming or hauled out near the project site within the range of noise levels elevated above the acoustic criteria. We recognize that pinnipeds in the water could be exposed to airborne sound that may result in behavioral harassment when looking with their heads above water. Most likely, airborne sound would cause behavioral responses similar to those discussed above in relation to underwater sound. 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 the area and move further from the source. However, these animals would likely previously have been 'taken' because of exposure to underwater sound above the behavioral harassment thresholds, which are in all cases larger than those associated with airborne sound. Thus, the behavioral harassment of these animals by airborne sound is already accounted for in the estimates of potential take from underwater exposure to pile driving sounds. Therefore, we do not believe that authorization of additional incidental take resulting from airborne sound for pinnipeds is warranted, and airborne sound is not discussed further here.

Stress Responses

An animal's perception of a threat may be sufficient to trigger stress responses consisting of some combination of behavioral responses, autonomic nervous system responses, neuroendocrine responses, or immune responses (*e.g.,* Seyle 1950; Moberg 2000). In many cases, an animal's first and sometimes most economical (in terms of energetic costs) response is behavioral avoidance of the potential stressor. Autonomic nervous system responses to stress typically involve changes in heart rate, blood pressure, and gastrointestinal activity. These responses have a relatively short duration and may or may not have a significant long-term effect on an animal's fitness.

Neuroendocrine stress responses often involve the hypothalamus-pituitary-adrenal system. Virtually all neuroendocrine functions that are affected by stress—including immune competence, reproduction, metabolism, and behavior—are regulated by pituitary hormones. Stress-induced changes in the secretion of pituitary hormones have been implicated in failed reproduction, altered metabolism, reduced immune competence, and behavioral disturbance (*e.g.,* Moberg 1987; Blecha 2000). Increases in the circulation of glucocorticoids are also equated with stress (Romano *et al.,* 2004).

The primary distinction between stress (which is adaptive and does not normally place an animal at risk) and ''distress'' is the cost of the response. During a stress response, an animal uses glycogen stores that can be quickly replenished once the stress is alleviated. In such circumstances, the cost of the stress response would not pose serious fitness consequences. However, when an animal does not have sufficient energy reserves to satisfy the energetic costs of a stress response, energy resources must be diverted from other functions. This state of distress will last until the animal replenishes its energetic reserves sufficient to restore normal function.

Relationships between these physiological mechanisms, animal behavior, and the costs of stress responses are well studied through controlled experiments and for both laboratory and free-ranging animals (*e.g.,* Holberton *et al.,* 1996; Hood *et al.,* 1998; Jessop *et al.,* 2003; Krausman *et al.,* 2004; Lankford *et al.,* 2005). Stress responses due to exposure to anthropogenic sounds or other stressors and their effects on marine mammals have also been reviewed (Fair and Becker 2000; Romano *et al.,* 2002b) and, more rarely, studied in wild populations (*e.g.,* Romano *et al.,* 2002a). For example, Rolland *et al.* (2012) found that noise reduction from reduced ship traffic in the Bay of Fundy was associated with decreased stress in North Atlantic right whales. These and other studies lead to a reasonable expectation that some marine mammals will experience physiological stress responses upon exposure to acoustic stressors and that it is possible that some of these would be classified as ''distress.'' In addition, any animal experiencing TTS would likely also experience stress responses (NRC, 2003).

Anticipated Effects on Habitat

The proposed activities at the project area would not result in permanent negative impacts to habitats used directly by marine mammals, but may have potential short-term impacts to food sources such as forage fish and may affect acoustic habitat (see masking discussion above). There are no known foraging hotspots or other ocean bottom structure of significant biological importance to marine mammals present in the marine waters of the project area during the construction window. The project area is located in an industrial and commercial shipping port. Therefore, the main impact issue associated with the proposed activity would be temporarily elevated sound levels and the associated direct effects on marine mammals, as discussed previously in this document. The primary potential acoustic impacts to marine mammal habitat are associated with elevated sound levels produced by vibratory and impact pile driving, drilling, and sediment removal in the area. However, other potential impacts to the surrounding habitat from physical disturbance are also possible, although this will be minimal since construction is occurring in an already industrial and commercial shipping area.

In-Water Construction Effects on Potential Prey (Fish)

Construction activities would produce continuous (*i.e.,* vibratory pile driving, drilling) and impulsive (*i.e.,* impact driving) sounds. 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) identified several studies that suggest fish may relocate to avoid certain areas of sound energy. Additional studies have documented effects of pile driving on fish, although several are based on studies in support of large, multiyear bridge construction projects (*e.g.,* Scholik and Yan 2001, 2002; Popper and Hastings 2009). Sound impulsive sounds at received levels of 160 dB may cause subtle changes in fish behavior. SPLs of 180 dB may cause noticeable changes in behavior (Pearson *et al.,* 1992; Skalski *et al.,* 1992). SPLs of sufficient strength have been known to cause injury to fish and fish mortality.

The most likely impact to fish from pile driving and pile removal activities at the Port's project area would be temporary behavioral avoidance of the 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 due to the short timeframe (15 days) for the project.

Pile Driving Effects on Potential Foraging Habitat

The area likely impacted by the project is relatively small compared to the available habitat in the Mission Bay/ Central Waterfront area of San Francisco Bay. Avoidance by potential prey (*i.e.,* fish) of the immediate area due to the temporary loss of this foraging habitat is also possible. 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 foraging habitat in the nearby vicinity of the MBFL and WTL on San Francisco Bay.

The duration of the construction activities, including pile driving and dredging is relatively short, estimated at 55 days. The construction window for pile driving and drilling is a maximum of 15 days and each day, activities would only occur for a few hours during the day. Impacts to habitat and prey are expected to be minimal based on the short duration of activities.

In summary, given the short daily duration of sound associated with individual pile driving and removal events and the relatively small areas being affected, pile driving and pile removal activities associated with the proposed action are not likely to have a permanent, adverse effect on any fish habitat, or populations of fish species. Thus, any impacts to marine mammal habitat are not expected to cause significant or long-term consequences for individual marine mammals or their populations.

Estimated Take

This section provides an estimate of the number of incidental takes proposed for authorization through this IHA, which will inform both NMFS' consideration of ''small numbers'' and the negligible impact determination.

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines ''harassment'' as: any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) 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 (Level B harassment).

Authorized takes would be by Level B harassment only, in the form of disruption of behavioral patterns for individual marine mammals resulting from exposure to acoustic sources. Based on the nature of the activity and the anticipated effectiveness of the mitigation measures (*i.e.,* use of a bubble curtain, wood cushion, and shutdown—discussed in detail below in the Proposed Mitigation section), Level A harassment is neither anticipated nor proposed to be authorized.

As described previously, no mortality is anticipated or proposed to be authorized for this activity. Below we describe how the take is estimated.

Generally speaking, we estimate take by considering: (1) Acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) and the number of days of activities. We note that while these basic factors can contribute to a basic calculation to provide an initial prediction of takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.,* previous monitoring results or average group size). Below, we describe these components in more detail and present the proposed take estimate.

Acoustic Thresholds

Using the best available science, NMFS has developed acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment).

Level B Harassment for non-explosive sources—Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.,* frequency, predictability, duty cycle), the environment (*e.g.,* bathymetry), and the receiving animals (hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Southall *et al.,* 2007, Ellison *et al.,* 2012). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 dB re 1 μPa (rms) for continuous (*e.g.* vibratory pile-driving, drilling) and above 160 dB re 1 μPa (rms) for non-explosive impulsive (*e.g.,* impact pile driving) sources.

The Port of San Francisco's proposed activity includes the use of continuous (vibratory pile driving, down the hole drilling) and impulsive (impact pile driving) sources, and therefore the 120 and 160 dB re 1 μPa (rms) thresholds are applicable.

Level A harassment for non-explosive sources—NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (NMFS, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). The Port of San Francisco's proposed activity includes the use of impulsive (impact pile driving) and non-impulsive (vibratory pile driving) sources.

These thresholds are provided in Table 3 below. The references, analysis, and methodology used in the development of the thresholds are described in NMFS's 2018 Technical Guidance, which may be accessed at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance.*

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Table 3. Thresholds identifying the onset of Permanent Threshold Shift

	PTS Onset Acoustic Thresholds* (Received Level)	
Hearing Group	**Impulsive**	**Non-impulsive**
Low-Frequency (LF) Cetaceans	*Cell 1* $L_{pk,flat}$: 219 dB $L_{E,LF,24h}$: 183 dB	*Cell 2* $L_{E,LF,24h}$: 199 dB
Mid-Frequency (MF) Cetaceans	*Cell 3* $L_{pk,flat}$: 230 dB $L_{E,MF,24h}$: 185 dB	*Cell 4* $L_{E,MF,24h}$: 198 dB
High-Frequency (HF) Cetaceans	*Cell 5* $L_{pk,flat}$: 202 dB $L_{E,HF,24h}$: 155 dB	*Cell 6* $L_{E,HF,24h}$: 173 dB
Phocid Pinnipeds (PW) (Underwater)	*Cell 7* $L_{pk,flat}$: 218 dB $L_{E,PW,24h}$: 185 dB	*Cell 8* $L_{E,PW,24h}$: 201 dB
Otariid Pinnipeds (OW) (Underwater)	*Cell 9* $L_{pk,flat}$: 232 dB $L_{E,OW,24h}$: 203 dB	*Cell 10* $L_{E,OW,24h}$: 219 dB

* Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.

Note: Peak sound pressure (L_{pk}) has a reference value of 1 μPa, and cumulative sound exposure level (L_E) has a reference value of 1μPa^{2}s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript "flat" is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (i.e., varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

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Ensonified Area

Here, we describe operational and environmental parameters of the activity that will feed into identifying the area ensonified above the acoustic thresholds, which include source levels and transmission loss coefficients.

Reference sound source levels used by the Port of San Francisco for all vibratory and impact piling/removal and drilling activities were derived from source level data from construction projects within Caltrans (2015) except for two cases noted below where Navy and Alaska Department of Transportation sources were used. To determine the ensonified areas for both the Level A and Level B harassment zones for vibratory piling of the 36-inch, 30-inch, and 16-inch steel piles and 14-inch steel H piles, the Port of San Francisco used SPLs of 170 dB re 1 μPa rms, 170 dB re 1 μPa rms, 158 dB re 1 μPa rms, and 158 dB re 1 μPa rms, respectively. These were derived from vibratory pile driving data of 36-inch (for 36-inch and 30-inch steel piles), 18-inch (for 16-inch steel piles) and 14-inch (for 14-inch steel H-pile) steel piles reported in the values listed in Table 1.2–2 and Table 1.2.3 of Caltrans (2015), and Table 6–1 of Navy (2017). For vibratory pile removal, the Port of San Francisco used an SPL of 155 dB re 1 μPa rms. This proxy source level was derived from vibratory pile driving data of 12-inch steel pipe piles in Caltrans (2015; Table 1.2–2). In addition, for down the hole drilling activities used to place 24-inch octagonal concrete piles, an SPL of 168 dB was used, corresponding to the mean SPL reported in Table 72 of the Alaska Department of Transportation (2016) hydroacoustic report.

For impact pile driving, the Port of San Francisco used both SPLs and Sound Exposure Levels (SEL) derived from summary source level values reported in Caltrans (2015). These source levels were then reduced by 7 dB due to the Port of San Francisco's use of a bubble curtain. NMFS used a reduction value of 7 dB as it was roughly the average sound reduction value derived from sound measurements of piles that used bubble curtains within Caltrans (2015). For piling of 36-inch steel piles, a source level of 183 dB SEL was chosen as a proxy value for modeling Level A harassment zones (Caltrans 2015, Table 1.2–1). This source level was reduced to 176 dB SEL with the 7 dB reduction. For piling of 20-inch concrete piles, a source level of 167 dB SEL was chosen as a proxy value for modeling Level A harassment zones (Caltrans 2015, Table 1.5–4, reported from 24-inch concrete pile measurements at a project in the Port of Oakland). This source level was selected as a proxy because of the proximity of the Port of Oakland project to the proposed work and is more conservative than Caltrans (2015) summary value reported in Table 1.2–1. This source level was reduced to 160 dB SEL with the 7 dB reduction. In addition, for impact piling of 16-inch steel piles, a source level of 158 dB SEL was chosen as a proxy value for modeling Level A harassment zones (Joaquin River Project; Caltrans 2015, Table 1.2–3). This source level was reduced to 151 dB SEL with the 7 dB reduction. The stated source levels and their corresponding activity are presented in Table 4 below.

TABLE 4—PROJECT SOURCE LEVELS

Activity	Source level at 10 meters (dB)
Vibratory Pile Driving/Removal	
36-inch steel pile installation	170 SPL
30-inch steel pile installation (Caisson).	170 SPL
14-inch steel H pile installation	158 SPL
Removal of pre-existing piles	155 SPL
16-inch steel pile installation	158 SPL
Impact Pile Driving*	
36-inch steel pile installation	176 SEL/186 SPL
20-inch concrete pile installation	160 SEL/172 SPL
16-inch steel pile installation	151 SEL/177 SPL
Down the Hole Drilling	
24-inch Octagonal Concrete (drilling of 30-inch hole).	168 SPL

*The values in the cells reflect a 7dB reduction due to the Port of San Francisco's use of a bubble curtain.

Level B Harassment Zones

The practical spreading model was used by the Port of San Francisco to generate the Level B harassment zones for all piling/removal activities. Practical spreading is described in full detail below.

Pile driving and drilling generates underwater noise that can potentially result in disturbance to marine mammals in the project area. Transmission loss (TL) 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 underwater TL is:

$$TL = B * \log10 (R1/R2),$$

Where:

R1 = the distance of the modeled SPL from the driven pile, and

R2 = the distance from the driven pile of the initial measurement.

This formula neglects loss due to scattering and absorption, which is assumed to be zero here. The degree to which underwater sound propagates away from a sound source is dependent on a variety of factors, most notably the water bathymetry and presence or absence of reflective or absorptive conditions including in-water structures and sediments. Spherical spreading occurs in a perfectly unobstructed (free-field) environment not limited by depth or water surface, resulting in a 6 dB reduction in sound level for each doubling of distance from the source (20 * log[range]). Cylindrical spreading occurs in an environment in which sound propagation is bounded by the water surface and sea bottom, resulting in a reduction of 3 dB in sound level for each doubling of distance from the source (10 * log[range]). A practical spreading value of 15 is often used under conditions where water increases with depth as the receiver moves away from the shoreline, resulting in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions.

Utilizing the practical spreading loss model, the Port of San Francisco determined underwater noise will fall below the behavioral effects threshold of 120 dB rms for marine mammals at a maximum radial distance of 21,544 meters for vibratory piling and drilling (36 and 30-inch steel piles; drilling for 24-inch octagonal concrete pile). The maximum Level B harassment zone for this activity will therefore be set at 21,544 meters. However, previous sound monitoring for other projects in San Francisco Bay (*i.e.* Caltrans 2015; 2016) have shown background sound levels in the active portions of the Bay, near the project area, to range from 110 to 140 dB rms, with typical background levels in the range of 110 to 120 dB rms. This ambient noise may affect the ability to distinguish sound from vibratory pile driving in the region (Rodkin, 2009), but direct applicability of that finding to the Port's work is unknown, and therefore no reduction in Level B harassment zone is applied. The maximum radial distance of the Level B harassment zone for impact pile driving equaled 541.2 meters (impact driving 36-inch steel piles). At this radial distance, the entire Level B harassment zone for impact piling equaled 0.3699 km². This ensonified area is based on a GIS map of the area accounting for structures and landmasses which would block sound spreading (Please see Figure 9 of the Application). Table 5 below provides all Level B radial distances and their corresponding areas for each activity during the Port of San Francisco's project. Level B harassment zone areas are calculated using a GIS map (See Figure 9 of the Application).

TABLE 5—LEVEL B HARASSMENT ZONES CALCULATED USING THE PRACTICAL SPREADING MODEL

Source	Calculated distance to Level B threshold (meters)	Level B harassment zone (square kilometers km²)
Vibratory Pile Driving		
36-inch steel pile installation	21,544	47.1608
30-inch steel pile installation	21,544	47.1608
16-inch steel pile installation	21,544	47.1608
14-inch steel H pile installation	3,415	7.6431
Removal of pre-existing concrete and wood piles	2,154	3.1511

TABLE 5—LEVEL B HARASSMENT ZONES CALCULATED USING THE PRACTICAL SPREADING MODEL—Continued

Source	Calculated distance to Level B threshold (meters)	Level B harassment zone (square kilometers km²)
Impact Pile Driving		
36-inch steel pile installation	541.2	0.36993
20-inch concrete pile installation	63.1	0.006650
16-inch steel pile installation	215	0.074044
Down the Hole Drilling		
	21,544	47.1608

Level A Harassment Zones

When the NMFS Technical Guidance (2016) was published, in recognition of the fact that the ensonified area could be more technically challenging to predict because of the duration component in the new thresholds, we developed a User Spreadsheet that includes tools to help predict a simple isopleth that can be used in conjunction with marine mammal density or occurrence to help predict takes. We note that because of some of the assumptions included in the methods used for these tools, we anticipate that isopleths produced are typically going to be overestimates of some degree, which will result in some overestimate of Level A harassment. However, these tools offer the best way to predict appropriate isopleths when more sophisticated 3D modeling methods are not available, and NMFS continues to develop ways to quantitatively refine these tools, and will qualitatively address the output where appropriate. For stationary sources (*i.e.* pile driving), NMFS's User Spreadsheet predicts the closest distance at which, if a marine mammal remained at that distance the whole duration of the activity, it would not incur PTS. Inputs used in the User Spreadsheet, and the resulting isopleths are reported below. Daily ensonified areas for Level A harassment are approximated as a semi-circle because the pile driving and drilling are occurring close to shore and the coastline is approximately linear.

TABLE 6—PARAMETERS OF PILE DRIVING AND DRILLING ACTIVITY

Equipment type	Vibratory pile driver (removal of concrete and wood piles)	Vibratory pile driver (installation of 36-inch steel piles)	Vibratory pile driver (installation of 30-inch steel piles)	Vibratory pile driver (installation of 16-inch steel piles)	Vibratory pile driver (installation of 14-inch steel H piles)	Impact pile driver (36-inch steel piles)	Impact pile driver (20-inch concrete piles)	Impact pile driver (16-inch steel piles)	Drilling (24-inch octagonal concrete pile)
Spreadsheet Tab Used	Non-impulsive, continuous.	Non-impulsive, continuous.	Non-impulsive, continuous.	Non-impulsive, continuous.	Non-impulsive, continuous.	Impulsive, Non-continuous.	Impulsive, Non-continuous.	Impulsive, Non-continuous.	Non-impulsive, continuous.
Source Level	155 SPL	170 SPL	170 SPL	158 SPL	158 SPL	176 SEL	160 SEL	151 SEL	168 SPL.
Weighting Factor Adjustment (kHz).	2.5	2.5	2.5	2.5	2.5	2	2	2	2.
(a) Activity duration (hours) within 24 hours, (b) Number of strikes per pile, (c) Number of piles per day.	(a) 0.4	(a) 0.33	(a) 0.25	(a) .33	(a) 0.33	(b) 150, (c) 4	(b) 500, (c) 4	(b) 500, (c) 2	(a) 6.
Propagation (xLogR)	15	15	15	15	15	15	15	15	15.
Distance of source level measurement (meters)+.	10	10	10	10	10	10	10	10	10.

TABLE 7—LEVEL A HARASSMENT ZONE ISOPLETH AND ENSONIFIED AREA FOR PILE DRIVING AND DRILLING

Source type	PTS isopleth (meters)				
	Low-frequency cetaceans	Mid-frequency cetaceans	High-frequency cetaceans	Phocid pinnipeds	Otariid pinnipeds
Vibratory Pile Driver (Removal of concrete and wood piles)	1.5	0.1	2.2	0.9	0.1
Vibratory Pile Driver (Installation of 36-inch steel piles)	13.1	1.2	19.3	7.9	0.6
Vibratory Pile Driver (Installation of 30-inch steel piles)	10.8	1.0	16.0	6.6	0.5
Vibratory Pile Driver (Installation of 14-inch steel H piles)	2.1	0.2	3.0	1.3	0.1
Vibratory Pile Driver (Installation of 16-inch steel H piles)	2.1	0.2	3.0	1.3	0.1
Impact Pile Driver (36-inch steel piles)	242.6	8.6	288.9	129.8	9.5
Impact Pile Driver (20-inch concrete piles)	46.4	1.7	55.3	24.8	1.8
Impact Pile Driver (16-inch steel piles)	7.3	0.3	8.8	3.9	0.3
Drilling (24-inch octagonal concrete pile)	6.3	0.4	5.5	3.4	0.2
Daily ensonified area (m²)					
Vibratory Pile Driver (Removal of concrete and wood piles)	3.5	0.02	7.6	1.3	0.02
Vibratory Pile Driver (Installation of 36-inch steel piles)	270	2.3	585	98	0.6
Vibratory Pile Driver (Installation of 30-inch steel piles)	183	1.6	402	68	0.4

TABLE 7—LEVEL A HARASSMENT ZONE ISOPLETH AND ENSONIFIED AREA FOR PILE DRIVING AND DRILLING—Continued

Source type	PTS isopleth (meters)				
	Low-frequency cetaceans	Mid-frequency cetaceans	High-frequency cetaceans	Phocid pinnipeds	Otariid pinnipeds
Vibratory Pile Driver (Installation of 14-inch steel H piles)	6.9	0.06	14	2.7	0.02
Vibratory Pile Driver (Installation of 16-inch steel H piles)	6.9	0.06	14	2.7	0.02
Impact Pile Driver (36-inch steel piles)	92450	120	131100	26460	140
Impact Pile Driver (20-inch concrete piles)	3380	4.5	4800	966	5.1
Impact Pile Driver (16-inch steel piles)	84	0.1	120	24	0.1
Drilling (24-inch octagonal concrete pile)	62	0.3	48	18	0.06

Marine Mammal Occurrence

In this section we provide the information about the presence, density, or group dynamics of marine mammals that will inform the take calculations.

No systematic line transect surveys of marine mammals have been performed in San Francisco Bay. Therefore, the in-water densities of harbor seals, California sea lions, and harbor porpoises were calculated based on 17 years of observations during monitoring for the San Francisco Bay-Oakland Bay Bridge (SFOBB) construction and demolition project (Caltrans 2018). Care was taken to eliminate multiple observations of the same animal, although this can be difficult and is likely that the same individual may have been counted multiple times on the same day. The amount of monitoring performed per year varied, depending on the frequency and duration of construction activities with the potential to affect marine mammals. During the 257 days of monitoring from 2000 through 2017 (including 15 days of baseline monitoring in 2003), 1,029 harbor seals, 83 California sea lions, and 24 harbor porpoises were observed in waters in the project vicinity in total. In 2015, 2016, and 2017, the number of harbor seals in the project area increased significantly. In 2017, the number of harbor porpoise in the project area also increased significantly. Therefore, a harbor seal density estimate was calculated using the 2015–2017 data, and a harbor porpoise density estimate was calculated using the 2017 data, which may better reflect the current use of the project area by these animals. These observations included data from baseline, pre-, during, and post-pile driving, mechanical dismantling, on-shore blasting, and off-shore implosion activities.

Insufficient sighting data exist to estimate the density of bottlenose dolphins. However, a single bottlenose dolphin has been observed regularly near the project site. One individual was documented regularly, through photo ID, over several months off the coast of the former Alameda Air Station (Perlman 2017).

Insufficient sighting data exist to estimate elephant seal densities in the Bay. Generally, only juvenile elephant seals enter the Bay and do not remain long. The most recent sighting near the project area was in 2012, on the beach at Clipper Cove on Treasure Island, when a healthy yearling elephant seal hauled out for approximately 1 day. Approximately 100 juvenile northern elephant seals strand in or near the Bay each year, including individual strandings at YBI and Treasure Island (less than 10 strandings per year).

In addition, insufficient sighting data exist to estimate northern fur seal and gray whale densities in the Bay. Only two to four northern fur seals strand in the Bay each year, and they are unlikely to occur in the project area. Also, during the Caltrans Richmond-San Rafael Bridge project, monitors recorded 12 living and two dead gray whales in the surveys performed in 2012. All sightings were in either the Central or North Bay, and all but two sightings occurred during the months of April and May. One gray whale was sighted in June and one in October. The Oceanic Society has tracked gray whale sightings since they began returning to San Francisco Bay regularly in the late 1990s. Most sightings occurred just a mile or two inside of the Golden Gate, with some traveling into San Pablo Bay in the northern part of the San Francisco Bay (Self 2012). The Oceanic Society data show that all age classes of gray whales enter San Francisco Bay and they enter as singles or in groups of up to five individuals (Winning 2008). It is estimated that two to six gray whales enter San Francisco Bay in any given year.

Numbers used for density calculations are shown in Table 8. These numbers were calculated from observations in nearby waters of the San Francisco Bay during San Francisco-Oakland Bay Bridge construction conducted by Caltrans (Caltrans 2018). These observations occurred from 2000 to 2017 in a 2 km^2 monitoring zone for California sea lions, from 2015–2017 in a 2 km^2 monitoring zone for harbor seals, and in 2017 in a 15 km^2 zone for harbor porpoise. In the cases where densities were refined to capture a narrower range of years to be conservative, bold densities were used for take calculations.

TABLE 8—ESTIMATED IN-WATER DENSITY OF MARINE MAMMAL SPECIES IN SAN FRANCISCO BAY AREA

[Caltrans 2017]

Species observed	Area of monitoring zone (km^2)	Days of monitoring	Number of animals observed	Density animals/km^2
Harbor Seals 2000–2017	2	257	1029	2.002.
Harbor Seals 2015–2017	2	47	372	3.957.
California Sea Lions 2000–2017	2	257	83	0.161.
Bottlenose Dolphins 2017	2	6	2	Insufficient sighting data exists to estimate density.
Harbor Porpoise 2000–2017	3	257	24	0.031.

TABLE 8—ESTIMATED IN-WATER DENSITY OF MARINE MAMMAL SPECIES IN SAN FRANCISCO BAY AREA—Continued

[Caltrans 2017]

Species observed	Area of monitoring zone (km²)	Days of monitoring	Number of animals observed	Density animals/km²
Harbor Porpoise 2017	15	6	15	0.167.
Elephant Seal 2000–2017	2	257	0	Insufficient sighting data exists to estimate density.
Northern Fur Seal 2000–2017	2	257	0	Insufficient sighting data exists to estimate density.
Gray Whale 2000–2017	2	257	0	Insufficient sighting data exists to estimate density.

Notes:

Densities for Pacific harbor seals, California sea lions, and harbor porpoises are based on monitoring for the east span of the SFOBB from 2000 to 2017.

A second set of Pacific harbor seal densities were calculated from the increase in sightings recorded from 2015 to 2017.

A second set of harbor porpoise densities were calculated for the increase in sightings that were recorded in 2017.

Bold densities were used for take calculations.

Sources: CalTrans 2001, 2004b, 2013b, 2013c, 2014, 2015b, 2016, 2017; Perlman 2017.

For species without enough sightings to construct a density estimate, we used information based on group size and frequency of sightings from previous years of work to inform the number of animals estimated to be taken, which is detailed in the Take Estimation section below.

Take Calculation and Estimation

Here we describe how the information provided above is brought together to produce a quantitative take estimate.

When density data was available, Level B take for the project was calculated by multiplying the density times the largest Level B harassment zone (km²) times the number of construction days. Since density data was only available for harbor seals, harbor porpoises, and California sea lions, these were the only species whose take was calculated used this methodology. Table 9 shows the number of take calculated for species with density and without density estimates. For species without density information, information on average group size of the species was used. This is discussed below Table 9.

TABLE 9—TAKE ESTIMATES AS A PERCENTAGE OF STOCK ABUNDANCE

Species	Density animals/km²	Level B harassment zone (km²) [1]	Construction days [2]	Proposed Level B take	Percentage of stock
Harbor Seal	3.957	47.1608	15	2928	9.5
California Sea Lions	0.161	47.1608	15	120	0.040
Harbor Porpoise	0.167	47.1608	15	124	1.3
Northern Elephant Seal	Insufficient sighting data exists to estimate density.	47.1608	15	1	0.0006
Northern Fur Seal	Insufficient sighting data exists to estimate density.	47.1608	15	1	0.0002
Gray Whale	Insufficient sighting data exists to estimate density.	47.1608	15	3	0.014
Bottlenose Dolphin	Insufficient sighting data exists to estimate density.	47.1608	15	15	3.3

[1] Represents area of largest Level B zone during pile driving/removal and drilling activities.

[2] Total construction days for pile driving/removal and drilling.

Gray Whale

Gray whales occasionally enter San Francisco Bay during their northward migration period of February and March. Pile driving and drilling are not proposed to occur during this time and gray whales are not likely to be present at other times of the year. It is estimated that two to six gray whales enter the Bay in any given year, but they are unlikely to be present during the work period (June 1 through November 30). However, individual gray whales have occasionally been observed in San Francisco Bay during the work period, and therefore it is conservatively estimated that, at most, 3 gray whales, or one average sized group, may be exposed to Level B harassment during the 15 days of pile driving/drilling.

Bottlenose Dolphin

When bottlenose dolphins are present in San Francisco Bay, they are more typically found close to the Golden Gate. Recently, beginning in 2015, two individuals have been observed frequently in the vicinity of Oyster Point (GGCR 2016, 2017; Perlman 2017) and one individual has been observed near Alameda (GGCR 2016). Observations of bottlenose dolphins are primarily west of Treasure Island and concentrated along the nearshore areas of San Francisco south to Redwood City (Caltrans 2018). Bottlenose dolphins rarely occur in San Francisco Bay, but given the size of the Level B harassment zone NMFS is proposing to authorize take of 15 bottlenose dolphins by level B harassment.

Northern Fur Seal

Observations of northern fur seals are too few to establish a density for this species in San Francisco Bay. The Marine Mammal Center (TMMC) reported only two to four northern fur seal strandings in the Bay in 2015 and 2016 (in Marin, San Francisco, and Santa Clara counties) (TMMC 2017). To account for the possible rare presence of the species in the action area, NMFS proposes to authorize one level B take of northern fur seal.

Northern Elephant Seal

Elephant seals breed between December and March and have been rarely cited in San Francisco Bay. It is anticipated that if an elephant seal is encountered at all during pile driving or drilling it would be a juvenile. To account for the possible rare presence of the species in the action area, NMFS proposed to authorize one level B take of elephant seal.

Level A Harassment

High frequency cetaceans (including harbor porpoise) have the largest Level A harassment zone resulting from this project as shown in Table 7. Estimated take by Level A harassment for harbor porpoise, based on density reported in Table 8 and the Level A harassment zone, is less than one individual (Density * Days * Ensonified Area). Given the required mitigation measures, including shutdown zones which exceed the Level A harassment zone, NMFS proposes no authorization of Level A harassment for harbor porpoise or any marine mammal.

Proposed Mitigation

In order to issue an IHA under Section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, we carefully consider two primary factors:

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned) the likelihood of effective implementation (probability implemented as planned); and

(2) The practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations.

In addition to the specific measures described later in this section, the Port must conduct briefings for construction supervisors and crews, the monitoring team, and Port staff prior to the start of all pile driving activity, and when new personnel join the work, in order to explain responsibilities, communication procedures, the marine mammal monitoring protocol, and operational procedures.

Timing Restrictions

All work will be conducted during daylight hours. If poor environmental conditions restrict full visibility of the shutdown zone, pile installation would be delayed.

Sound Attenuation

Sound attenuation methods will be implemented for the duration of impact pile driving to install 36-inch and 16-inch steel and 20-inch concrete piles (*i.e.,* cushion block, bubble curtain, sleeve etc.) and shall implement the following bubble curtain performance standards:

• The bubble curtain must distribute air bubbles around 100 percent of the piling perimeter for the full depth of the water column.

• The lowest bubble ring shall be in contact with the mudline for the full circumference of the ring, and the weights attached to the bottom ring shall ensure 100 percent mudline contact. No parts of the ring or other objects shall prevent full mudline contact.

• The selected contractor will ensure that personnel are trained in the proper balancing of air flow to the bubblers and shall require that construction contractors submit an inspection/performance report for approval by the Port within 72 hours following the performance test. Corrections to the attenuation device to meet the performance standards shall occur prior to impact driving.

Shutdown Zone for In-Water Heavy Machinery Work

For in-water heavy machinery work (using, *e.g.,* standard barges, tug boats, barge-mounted excavators, or clamshell equipment used to place or remove material), a minimum 10 meter shutdown zone shall be implemented. If a marine mammal comes within 10 meters of such operations, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions. This type of work could include (but is not limited to) the following activities: (1) Vibratory pile driving; (2) movement of the barge to the pile location; (3) positioning of the pile on the substrate via a crane (*i.e.,* stabbing the pile); or (4) removal of the pile from the water column/substrate via a crane (*i.e.,* deadpull).

Additional Shutdown Zones

For all pile driving/removal and drilling activities, The Port of San Francisco will establish a shutdown zone for a marine mammal species that is greater than its corresponding Level A harassment zone. The purpose of a shutdown zone is generally to define an area within which shutdown of the activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). The shutdown zones for each of the pile driving and drilling activities are listed below in Table 10.

TABLE 10—SHUTDOWN ZONES

Source	Shutdown zones (meters)				
	Low-frequency cetaceans (humpback whale, minke whale)	Mid-frequency cetaceans (Pacific-white sided dolphin)	High-frequency cetaceans (Dall's porpoise, harbor porpoise)	Phocid (harbor seal)	Otariid (sea lion)
In-Water Construction Activities *					
In Water Heavy Construction (*i.e.,* Barge movements, pile positioning, deadpulling, and sound attenuation)	10	10	10	10	10
Vibratory Pile Driving					
Vibratory Pile Driver (Removal of concrete and wood piles)	10	10	10	10	10
Vibratory Pile Driver (Installation of 14-inch steel H piles)	10	10	10	10	10
Vibratory Pile Driver (Installation of 16-inch steel H piles)	10	10	10	10	10
Vibratory Pile Driver (Installation of 30-inch steel piles)	25	10	25	10	10
Vibratory Pile Driver (Installation of 36-inch steel piles)	25	10	25	10	10
Impact Pile Driving					
Impact Pile Driver (16-inch steel piles)	125	10	150	75	10
Impact Pile Driver (20-inch concrete piles)	75	10	75	30	10
Impact Pile Driver (36-inch steel piles)	250	25	300	150	25
Drilling					
24-inch concrete pile (1 pile) (3 hours per day on 1 day)	10	10	10	10	10

Monitoring Zones

The Port of San Francisco will establish and observe a monitoring zone. The monitoring zones for this project will differ based on activity. For vibratory pile driving and down the hole drilling, it may not be possible to observe the entire Level B harassment zones (areas where SPLs are equal to or exceed 120 dB rms) due to their size. The Port is expected to monitor and record observations in the largest reasonable portion of this Level B harassment zone based on the number of observers and visibility, but conditions may require efforts to be focused in a smaller monitoring zone. For impact pile driving, the monitoring zones are areas where SPLs are equal to or exceed 160 dB rms. For vibratory pile driving/drilling and impact pile driving the Level B Harassment zones are presented in Table 11 below. For the vibratory pile driving and drilling activities, it is noted that Level B harassment zone radius and area will not necessarily equal the monitoring zone. These zones provide utility for monitoring conducted for mitigation purposes (*i.e.,* shutdown zone monitoring) by establishing monitoring protocols for areas adjacent to the shutdown zones. Monitoring of disturbance zones enables observers to be aware of and communicate the presence of marine mammals in the project area, but outside the shutdown zone, and thus prepare for potential shutdowns of activity. However, the primary purpose of disturbance zone monitoring is for documenting instances of Level B harassment; disturbance zone monitoring is discussed in detail later (see Monitoring and Reporting).

TABLE 11—MONITORING ZONES

Source	Radial distance to Level B threshold (meters)	Level B harassment zone (km^2)
Vibratory Pile Driving		
36-inch steel pile installation	*21,544	*47.1608
30-inch steel pile installation	*21,544	*47.1608
16-inch steel pile installation	*21,544	*47.1608
14-inch steel H pile installation	*3,415	*7.6431
Removal of pre-existing concrete and wood piles	*21,544	*47.1608
Impact Pile Driving		
36-inch steel pile installation	541.2	0.3699
20-inch concrete pile installation	63.1	0.006650

TABLE 11—MONITORING ZONES—Continued

Source	Radial distance to Level B threshold (meters)	Level B harassment zone (km^2)
16-inch steel pile installation	215	0.074044
Down the Hole Drilling		
	*21,544	*47.1608

*The monitored radius and area of the Level B harassment zone may vary based on visibility.

Non-Authorized Take Prohibited

If a species enters or approaches the Level B harassment zone and that species is either not authorized for take or its authorized takes are met, pile driving, pile removal, and drilling activities must shut down immediately using delay and shut-down procedures. Activities must not resume until the animal has been confirmed to have left the area or an observation time period of 15 minutes has elapsed.

Soft Start

The use of a soft-start procedure is believed to provide additional protection to marine mammals by providing warning and/or giving marine mammals a chance to leave the area prior to the impact hammer operating at full capacity. For impact pile driving, contractors will be required to provide an initial set of strikes from the hammer at 40 percent energy, each strike followed by no less than a 30-second waiting period. This procedure will be conducted a total of three times before impact pile driving begins. This soft start procedure must be implemented at the start of a day's impact pile driving and at any time following cessation of impact driving of 30 minutes or greater. Soft start is not required during vibratory pile driving/removal or drilling activities.

Pre-Activity Monitoring

Prior to the start of daily in-water construction activity, or whenever a break in pile driving or drilling of 30 minutes or longer occurs, the observer will observe the shutdown and monitoring zones for a period of 30 minutes. The shutdown zone will be cleared when a marine mammal has not been observed within the zone for that 30-minute period. A determination that the shutdown zone is clear must be made during a period of good visibility (*i.e.,* the entire shutdown zone and surrounding waters must be visible to the naked eye). If a marine mammal is observed within the shutdown zone, a soft-start cannot proceed until the animal has left the zone or has not been observed for 15 minutes. If the monitoring zone has been observed for 30 minutes and non-permitted species are not present within the zone, soft start procedures can commence and work can continue even if visibility becomes impaired within the monitoring zone. When a marine mammal permitted for Level B take is present in the monitoring zone, pile driving, pile removal, and drilling activities may begin and Level B take will be recorded. As stated above, if the entire Level B zone is not visible at the start of construction, piling or drilling activities can begin. If work ceases for more than 30 minutes, the pre-activity monitoring of both the monitoring zone and shutdown zone will commence.

Based on our evaluation of the applicant's proposed measures, as well as other measures considered by NMFS, NMFS has preliminarily determined that the proposed mitigation measures provide the means effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Proposed Monitoring and Reporting

In order to issue an IHA for an activity, Section 101(a)(5)(D) of the MMPA states that NMFS must set forth, requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104(a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the proposed action area. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.,* presence, abundance, distribution, density);
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) Action or environment (*e.g.,* source characterization, propagation, ambient noise); (2) affected species (*e.g.,* life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.,* age, calving or feeding areas);
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors;
- How anticipated responses to stressors impact either: (1) Long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks;
- Effects on marine mammal habitat (*e.g.,* marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat); and
- Mitigation and monitoring effectiveness.

Hydroacoustic Monitoring

The Port recognizes in their application the need to implement a sound monitoring plan (SMP) as required by the Regional NMFS and U.S. Army Corps of Engineers programmatic review for pile driving activities in San Francisco Bay. The Port indicates that this SMP will recommend sound monitoring stations at 10 m, 100 m, and 300 m to monitor ambient noise conditions in the area. NMFS feels that ambient noise measurements are highly specific to the time and place they were taken, and therefore might have limited use to future projects. However, there are few source level measurements for down the hole drilling activities, as shown by the use of Alaska DOT proxy data in this IHA. NMFS feels that rigorous hydroacoustic monitoring of source level for the down the hole drilling activity will be more beneficial for future projects in this region and others. While NMFS is not requiring these source level measurements, if the Port were already planning to conduct measurements, we recommend focusing on source level verification and could offer guidance on its implementation.

Visual Monitoring

Monitoring would be conducted 30 minutes before, during, and 30 minutes after all pile driving/removal and drilling activities. In addition, observers shall record all incidents of marine mammal occurrence, regardless of distance from activity, and shall document any behavioral reactions in concert with distance from piles being driven, removed, or pile holes being drilled. Pile driving and drilling activities include the time to install, remove, or drill a hole for a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than thirty minutes.

Monitoring will be conducted by NMFS approved Protected Species Observers (PSOs). There will be at least two PSOs, but this number could be higher, depending on the type of pile driving/drilling and size of pile, which determines the size of the harassment zones. At least two land-based PSOs will monitor during all pile driving/removal and drilling activities.

PSOs shall scan the waters using binoculars, and/or spotting scopes, and shall use a handheld GPS or range-finder device to verify the distance to each sighting from the project site. All PSOs shall be trained in marine mammal identification and behaviors and are required to have no other project-related tasks while conducting monitoring. In addition, monitoring shall be conducted by qualified observers, who shall be placed at the best vantage point(s) practicable to monitor for marine mammals and implement shutdown/delay procedures when applicable by calling for the shutdown to the hammer operator. Qualified observers are trained and/or experienced professionals, with the following minimum qualifications:

i. At least one PSO must have prior experience working as a marine mammal observer during construction activities;

- Independent observers (*i.e.,* not construction personnel);

ii. Other PSOs may substitute education (degree in biological science or related field) or training for experience;

iii. Where a team of three or more PSOs are required, a lead observer or monitoring coordinator shall be designated. The lead observer must have prior experience working as a marine mammal observer during construction;

iv. The Port of San Francisco shall submit PSO CVs for approval by NMFS; The Port of San Francisco shall ensure that observers have the following additional qualifications:

- Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance; use of binoculars may be necessary to correctly identify the target;
- Ability to conduct field observations and collect data according to assigned protocols;
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates, times, and reason for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior;
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary; and
- Sufficient training, orientation, or experience with the construction operations to provide for personal safety during observations.

The Port of San Francisco shall submit a draft report to NMFS not later than 90 days following the end of construction activities. The Port of San Francisco shall provide a final report within 30 days following resolution of NMFS' comments on the draft report. Reports shall contain, at minimum, the following:

- Date and time that monitored activity begins and ends for each day conducted (monitoring period);
- Construction activities occurring during each daily observation period, including how many and what type of piles driven;
- Deviation from initial proposal in pile numbers, pile types, average driving times, etc.;
- Weather parameters in each monitoring period (*e.g.,* wind speed, percent cloud cover, visibility);
- Water conditions in each monitoring period (*e.g.,* sea state, tide state);
- Extrapolated estimates of the total observed Level B harassment takes based on the percentage of the Level B harassment zone that was not visible or was not monitored
- For each marine mammal sighting:
  - Species, numbers, and, if possible, sex and age class of marine mammals;
  - Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity;
  - Location and distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
  - Estimated amount of time that the animals remained in the Level B harassment zone;
  - Description of implementation of mitigation measures within each monitoring period (*e.g.,* shutdown or delay);
  - Other human activity in the area within each monitoring period; and
  - A summary of the following:
    - Total number of individuals of each species detected within the monitoring zone, and estimated as taken if correction factor appropriate;
    - Total number of individuals of each species detected within the Level A harassment zone and the average amount of time that they remained in that zone; and
    - Daily average number of individuals of each species (differentiated by month as appropriate) detected within the monitoring zone, and estimated as taken, if appropriate.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.,* population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be "taken" through harassment, NMFS considers other factors, such as the likely nature of any responses (*e.g.,* intensity, duration), the context of any responses (*e.g.,* critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS's implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (*e.g.,* as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

As stated in the mitigation section, bubble curtains will be used and shutdown zones that encompass the area in which Level A harassment might be expected to occur will be implemented. As a result, no Level A take is expected nor authorized for this activity. Exposures to elevated sound levels produced during pile driving activities may cause behavioral responses by an animal, but they are expected to be mild and temporary. Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (*e.g.,* Thorson and Reyff, 2006; Lerma, 2014). Most likely, individuals will simply move away from the sound source and be temporarily displaced from the areas of pile driving, although even this reaction has been observed primarily only in association with impact pile driving. These reactions and behavioral changes are expected to subside quickly when the exposures cease. Within the project area, there are no critical habitats or other biologically important areas (Calambokidis *et al.,* 2015). The area is an active commercial port, and while harbor seals, California sea lions, and other marine mammals may be present, the area is not an established rookery or breeding ground for local populations.

During all impact driving, implementation of soft start procedures, the use of a bubble curtain, and monitoring of established shutdown zones will be required. Given sufficient notice through use of soft start (for impact driving), marine mammals are expected to move away from an irritating sound source prior to it becoming potentially injurious. In addition, PSOs will be stationed within the action area whenever pile driving/removal and drilling operations are underway. Depending on the activity, The Port of San Francisco will employ the use of at least two PSOs to ensure all monitoring and shutdown zones are properly observed.

Although the Mission Bay Ferry and Water Taxi Landing Project would have some permanent removal of habitat available to marine mammals, the area lost would negligible. Construction of the MBFL and WTL structures and dredging for the project will result in the disturbance of up to approximately 8.4 acres of predominantly fine-grained sediment and the associated benthic infaunal community. Total habitat disturbed from the project activities is estimated at 0.000071 percent of the total South San Francisco Bay subtidal habitat available (NOAA 2007). This is a relatively small fraction of area relative to the total available habitat for foraging and transit for marine mammals. In addition, to minimize impacts, in-water construction will be limited to locally established environmental work windows between June and November.

Overall, impacts to marine mammals and prey species due to the Mission Bay Ferry and Water Taxi Landing Project are expected to be minor and temporary. The area impacted by the project is very small compared to the available habitat around San Francisco Bay. The most likely impact to prey will be temporary behavioral avoidance of the immediate area. During pile driving and drilling, it is expected that fish and marine mammals would temporarily move to nearby locations and return to the area following cessation of in-water construction activities. Therefore, indirect effects on marine mammal prey during the construction are not expected to be substantial.

In summary and as described above, the following factors primarily support our determination that the impacts resulting from this activity are not expected to adversely affect the species or stock through effects on annual rates of recruitment or survival:

- Mortality is not anticipated or authorized;
- Minimal impacts to marine mammal habitat are expected;
- Bubble curtain and other sound attenuating devices are used during impact pile driving will lessen the amount of behavioral disturbance and contribute to the alleviation of the likelihood of injury;
- Impacts are not occurring in rookeries, or known areas or features of special significance for foraging or reproduction in the project area;
- Anticipated incidents of Level B harassment consist of, at worst, temporary modifications in behavior; and
- Required mitigation measures (*i.e.* shutdown zones) are expected to be effective in reducing the effects of the specified activity.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the monitoring and mitigation measures, NMFS preliminarily finds that the total marine mammal take from the activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted above, only small numbers of incidental take may be authorized under Section 101(a)(5)(D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

Take for all species authorized except harbor seal is less than five percent of their respective stock abundance. For harbor seal, the authorized take is less than 10 percent of the stock abundance. Based on this and the analysis contained herein of the proposed activity (including the proposed mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS preliminarily finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Endangered Species Act (ESA)

No incidental take of ESA-listed species is proposed for authorization or expected to result from this activity. Therefore, NMFS has determined that formal consultation under section 7 of the ESA is not required for this action.

Proposed Authorization

As a result of these preliminary determinations, NMFS proposes to issue an IHA to the Port of San Francisco for conducting pile driving/removal and drilling in San Francisco Bay from June 1, 2019 to May 31, 2020, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. This section contains a draft of the IHA itself. The wording contained in this section is proposed for inclusion in the IHA (if issued).

1. This Incidental Harassment Authorization (IHA) is valid from June 1, 2019, to May 31, 2020.

2. This IHA is valid only for impact pile driving, vibratory pile driving, vibratory pile removal, and drilling activities associated with the construction of the Mission Bay Ferry and Water Taxi Landing Project in San Francisco Bay, California

3. General Conditions

(a) A copy of this IHA must be in the possession of the Port of San Francisco, its designees, and work crew personnel operating under the authority of this IHA;

(b) The species authorized for taking are gray whale (*Eschrichtius robustus*), bottlenose dolphin (*Tursiops truncatus*), harbor porpoise (*Phocoena phocoena*), California sea lion (*Zalophus californianus*), northern fur seal (*Callorhinus ursinus*), Pacific harbor seal (*Phoca vitulina richardii*), and northern elephant seal (*Mirounga angustirostris*);

(c) The taking, by Level B harassment only, is limited to the species listed in condition 3(b). See Table 9 for numbers of take authorized;

(d) The taking by serious injury or death of any of the species listed in condition 3(b) of the Authorization or any taking of any other species of marine mammal is prohibited and may result in the modification, suspension, or revocation of this IHA;

(e) The Port of San Francisco must conduct briefings between construction supervisors and crews and marine mammal monitoring team prior to the start of all pile driving, pile removal, and drilling, and when new personnel join the work, in order to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures; and

(f) Pile driving and drilling activities authorized under this IHA may only occur during daylight hours.

4. Mitigation Measures

The holder of this Authorization is required to implement the following mitigation measures:

(a) For all pile driving/removal, drilling, and in-water heavy machinery work, the Port of San Francisco must implement a shutdown zone around the pile or work zone. If a marine mammal comes within or approaches the shutdown zone, such operations must cease. See Table 10 for minimum radial distances required for shutdown zones;

(b) After a shutdown occurs, impact pile driving, vibratory piling driving/removal, and/or drilling can only begin after the animal is observed leaving the shutdown zone or has not been observed for 15 minutes;

(c) The Port of San Francisco must use sound attenuation devices (*i.e.* cushion block, and bubble curtain) during all impact pile driving and a caisson sleeve during drilling. The Port of San Francisco must implement the following bubble curtain performance standards:

(1) The bubble curtain must distribute air bubbles around 100 percent of the piling perimeter for the full depth of the water column;

(2) The lowest bubble ring must be in contact with the mudline for the full circumference of the ring, and the weights attached to the bottom ring must ensure 100 percent mudline contact. No parts of the ring or other objects shall prevent full mudline contact; and

(3) The selected contractor must ensure that personnel are trained in the proper balancing of air flow to the bubblers and must require that construction contractors submit an inspection/performance report for approval by the Port within 72 hours following the performance test. Corrections to the attenuation device to meet the performance standards must occur prior to impact driving;

(d) The Port of San Francisco must use a soft-start procedure for impact pile driving. During a soft start, The Port of San Francisco is 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. This soft-start must be applied prior to beginning pile driving activities each day or when impact pile driving hammers have been idle for more than 30 minutes;

(e) If a species enters or approaches the Level B harassment zone and that species is either not authorized for take or its authorized takes are met, pile driving and removal activities must shut down immediately using delay and shut-down procedures; and

(f) The Port of San Francisco must establish monitoring locations as described below.

5. Monitoring

The holder of this Authorization is required to conduct marine mammal monitoring during all pile driving/removal and drilling activities. Monitoring and reporting must be conducted in accordance with the Monitoring Plan as described below.

(a) The Port of San Francisco must monitor the Level B harassment zones and shutdown zones shown in Tables 10 and 11 during all pile driving/removal and drilling activities. Monitoring efforts in the Level B harassment zone can be concentrated in a subset of the zone if it is not feasible to observe the entire zone.

(b) If waters exceed a sea-state which restricts the observers' ability to make observations within the marine mammal shutdown zone, pile installation/removal and drilling must cease. Pile driving and/or drilling must not be initiated or continue until the entire largest shutdown zone for the activity is visible.

(c) Prior to the start of daily in-water construction activity, or whenever a break in pile driving/removal and/or drilling of 30 minutes or longer occurs, the PSOs must observe the shutdown and monitoring zones for a period of 30 minutes before construction activities can begin.

(d) If the shutdown zones have been observed to be clear of marine mammals for 30 minutes, in-water construction can commence and work can continue even if visibility becomes impaired within the Level B harassment zone.

(e) Monitoring must be conducted by qualified PSOs, with minimum qualifications as described previously in the *Monitoring and Reporting* section of the proposed *Federal Notice.* PSO requirements include:

(i) At least two PSOs must be on site to actively observe the shutdown and disturbance zones during all pile driving, removal, and drilling;

(ii) Observers must use their naked eye with the aid of binoculars, and/or a spotting scope during all pile driving and extraction activities;

(iii) All PSOs must be positioned in the best vantage point to have an unobstructed view of all water within the shutdown zone and as much of the Level B harassment zone as possible for pile driving/removal and/or drilling;

(iv) Observers must be independent (*i.e.,* not construction personnel);

(v) At least one PSO must have prior experience working as a marine mammal observer during construction activities;

(vi) (Other PSOs may substitute education (degree in biological science or related field) or training for experience;

(vii) Where a team of three or more PSOs are required, a lead observer or monitoring coordinator shall be designated. The lead observer must have prior experience working as a marine mammal observer during construction;

(viii) The Port of San Francisco shall submit PSO CVs for approval by NMFS;

(f) Marine mammal location must be determined using a rangefinder and a GPS or compass;

(g) Post-construction monitoring must be conducted for 30 minutes beyond the cessation of piling and drilling activities at end of day.

6. Reporting

The holder of this Authorization is required to:

(a) Submit a draft report on all monitoring conducted under the IHA within 90 calendar days of the completion of marine mammal monitoring. This report must detail the monitoring protocol, summarize the data recorded during monitoring, and estimate the number of marine mammals that may have been harassed, including the total number extrapolated from observed animals across the entirety of relevant monitoring zones. Given that the entire Level B harassment zone may not be readily observable, takes must be recorded and extrapolated based upon the amount of total observed takes and the percentage of the Level B harassment zone that was not visible.

A final report must be prepared and submitted within 30 days following resolution of comments on the draft report from NMFS. This report must contain the following:

(i) Date and time a monitored activity begins or ends;

(ii) Construction activities occurring during each observation period;

(iii) Record of implementation of shutdowns, including the distance of animals to the pile and description of specific actions that ensued and resulting behavior of the animal, if any;

(iv) An estimated total take extrapolated from the number of marine mammals observed during the course of construction activities, if necessary.

(v) Deviation from initial proposal in pile numbers, pile types, average driving times, etc.;

(vi) Weather parameters (*e.g.,* percent cover, visibility);

(vii) Water conditions (*e.g.,* sea state, tide state);

(viii) Species, numbers, and, if possible, sex and age class of marine mammals;

(ix) Description of any observable marine mammal behavior patterns,

(x) Distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;

(x) Locations of all marine mammal observations; and

(xi) Other human activity in the area.

(b) Reporting injured or dead marine mammals:

(i) In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by this IHA, such as an injury (Level A harassment), serious injury, or mortality, The Port of San Francisco must immediately cease the specified activities and report the incident to the Office of Protected Resources, NMFS, and the West Coast Stranding Coordinator, NMFS. The report must include the following information:

1. Time and date of the incident;
2. Description of the incident;
3. Environmental conditions (*e.g.,* wind speed and direction, Beaufort sea state, cloud cover, and visibility);
4. Description of all marine mammal observations and active sound source use in the 24 hours preceding the incident;
5. Species identification or description of the animal(s) involved;
6. Fate of the animal(s); and
7. Photographs or video footage of the animal(s).

Activities must not resume until NMFS is able to review the circumstances of the prohibited take. NMFS will work with the Port of San Francisco to determine what measures are necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. The Port of San Francisco may not resume their activities until notified by NMFS;

(i) In the event that the Port of San Francisco discovers an injured or dead marine mammal, and the lead observer determines that the cause of the injury or death is unknown and the death is relatively recent (*e.g.,* in less than a moderate state of decomposition), the Port of San Francisco must immediately report the incident to the Office of Protected Resources, NMFS, and the West Coast Stranding Coordinator, NMFS;

(ii) The report must include the same information identified in 6(b)(i) of this IHA. Activities may continue while NMFS reviews the circumstances of the incident. NMFS will work with the Port of San Francisco to determine whether additional mitigation measures or modifications to the activities are appropriate;

(iii) In the event that the Port of San Francisco discovers an injured or dead marine mammal, and the lead observer determines that the injury or death is not associated with or related to the activities authorized in the IHA (*e.g.,* previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), the Port of San Francisco must report the incident to the Office of Protected Resources, NMFS, and the West Coast Stranding Coordinator, NMFS, within 24 hours of the discovery. The Port of San Francisco must provide photographs or video footage or other documentation of the stranded animal sighting to NMFS;

7. This Authorization may be modified, suspended or withdrawn if the holder fails to abide by the conditions prescribed herein, or if NMFS determines the authorized taking is having more than a negligible impact on the species or stock of affected marine mammals.

Request for Public Comments

We request comment on our analyses, the proposed authorization, the Port's potential sound source verification efforts, and any other aspect of this Notice of Proposed IHA for the proposed action. We also request comment on the potential for renewal of this proposed IHA as described in the paragraph below. Please include with your comments any supporting data or literature citations to help inform our final decision on the request for MMPA authorization.

On a case-by-case basis, NMFS may issue a second one-year IHA without additional notice when (1) another year of identical or nearly identical activities as described in the Specified Activities section is planned or (2) the activities would not be completed by the time the IHA expires and a second IHA would allow for completion of the activities beyond that described in the Dates and Duration section, provided all of the following conditions are met:

- A request for renewal is received no later than 60 days prior to expiration of the current IHA;
- The request for renewal must include the following:

(1) An explanation that the activities to be conducted beyond the initial dates either are identical to the previously analyzed activities or include changes so minor (*e.g.,* reduction in pile size) that the changes do not affect the previous analyses, take estimates, or

mitigation and monitoring requirements; and

(2) A preliminary monitoring report showing the results of the required monitoring to date and an explanation showing that the monitoring results do not indicate impacts of a scale or nature not previously analyzed or authorized;

• Upon review of the request for renewal, the status of the affected species or stocks, and any other pertinent information, NMFS determines that there are no more than minor changes in the activities, the mitigation and monitoring measures remain the same and appropriate, and the original findings remain valid.

Dated: August 16, 2018.

Donna S. Wieting,

Director, Office of Protected Resources, National Marine Fisheries Service.

[FR Doc. 2018–18056 Filed 8–21–18; 8:45 am]

BILLING CODE 3510–22–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XG432

North Pacific Fishery Management Council; Public Meeting

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice of telephonic meeting.

SUMMARY: The North Pacific Fishery Management Council (Council) Observer Advisory Committee Subgroup will meet September 5, 2018.

DATES: The meeting will be held on Wednesday, September 5, 2018, from 1 p.m. to 2:30 p.m.

ADDRESSES: The meeting will be held telephonically. Teleconference line: (907) 271–2896.

Council address: North Pacific Fishery Management Council, 605 W 4th Ave., Suite 306, Anchorage, AK 99501–2252; telephone: (907) 271–2809.

FOR FURTHER INFORMATION CONTACT: Elizabeth Figus, Council staff; telephone: (907) 271–2809.

SUPPLEMENTARY INFORMATION:

Agenda

The agenda will include: A discussion of the Observer Program Fee Analysis developments since June 2018, including an outline, alternatives, monitoring objectives, and discussion of analysis methods.

Public Comment

Public comment letters will be accepted and should be submitted either electronically to Elizabeth Figus, Council staff: *Elizabeth.figus@noaa.gov* or through the mail: North Pacific Fishery Management Council, 605 W 4th Ave., Suite 306, Anchorage, AK 99501–2252. In-person oral public testimony will be accepted at the discretion of the chair.

Special Accommodations

The meeting is physically accessible to people with disabilities. Requests for sign language interpretation or other auxiliary aids should be directed to Shannon Gleason at (907) 271–2809 at least 7 working days prior to the meeting date.

Dated: August 17, 2018.

Tracey L. Thompson,

Acting Deputy Director, Office of Sustainable Fisheries, National Marine Fisheries Service.

[FR Doc. 2018–18118 Filed 8–21–18; 8:45 am]

BILLING CODE 3510–22–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XG003

Pacific Island Fisheries; Marine Conservation Plan for American Samoa; Western Pacific Sustainable Fisheries Fund

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice of agency decision.

SUMMARY: NMFS announces approval of a marine conservation plan (MCP) for American Samoa.

DATES: This agency decision is effective from July 25, 2018, through July 24, 2021.

ADDRESSES: You may obtain a copy of the MCP, identified by NOAA–NMFS–2018–0014, from the Federal e-Rulemaking Portal, *http://www.regulations.gov/#!docketDetail;D=NOAA-NMFS-2018-0014,* or from the Western Pacific Fishery Management Council (Council), 1164 Bishop St., Suite 1400, Honolulu, HI 96813, tel 808–522–8200, *http://www.wpcouncil.org.*

FOR FURTHER INFORMATION CONTACT: Gabriel Forrester, Sustainable Fisheries, NMFS Pacific Island Regional Office, 808–725–5179.

SUPPLEMENTARY INFORMATION: Section 204(e) of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) authorizes the Secretary of State, with the concurrence of the Secretary of Commerce (Secretary) and in consultation with the Council, to negotiate and enter into a Pacific Insular Area fishery agreement (PIAFA). A PIAFA would allow foreign fishing within the U.S. Exclusive Economic Zone (EEZ) adjacent to American Samoa, Guam, or the Northern Mariana Islands. The Governor of the Pacific Insular Area to which the PIAFA applies must request the PIAFA. The Secretary of State may negotiate and enter the PIAFA after consultation with, and concurrence of, the applicable Governor.

Before entering the PIAFA, the applicable Governor, with concurrence of the Council, must develop and submit to the Secretary a 3-year MCP providing details on uses for and funds collected by the Secretary for MCP review and approval. NMFS is the designee of the Secretary for MCP review and approval. The Magnuson-Stevens Act requires payments received under a PIAFA to be deposited into the United States Treasury and then conveyed to the Treasury of the Pacific Insular Area for which funds were collected.

In the case of violations by foreign fishing vessels in the EEZ around any Pacific Insular Area, amounts received by the Secretary attributable to fines and penalties imposed under the Magnuson-Stevens Act, including sums collected from the forfeiture and disposition or sale of property seized subject to its authority, shall be deposited into the Treasury of the Pacific Insular Area adjacent to the EEZ in which the violation occurred, after direct costs of the enforcement action are subtracted. The Pacific Insular Area government may use funds deposited into the treasury of the Pacific Insular Area for fisheries enforcement and for implementation of an MCP.

Federal regulations at 50 CFR 665.819 authorize NMFS to specify catch limits of longline-caught bigeye tuna for U.S. territories. NMFS may also authorize each territory to allocate a portion of that limit to U.S. longline fishing vessels that are permitted to fish under the Fishery Ecosystem Plan for Pelagic Fisheries of the Western Pacific (FEP). Payments collected under specified fishing agreements are deposited into the Western Pacific Sustainable Fisheries Fund, and any funds attributable to a particular Fisheries Fund, and any funds attributable to a particular territory may be used only for implementation of that territory's MCP.