DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XG067

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Chevron Richmond Refinery Long Wharf Maintenance and Efficiency 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.

SUMMARY: NMFS has received a request from Chevron for authorization to take marine mammals incidental to incidental to pile driving and removal associated with the Long Wharf Maintenance and Efficiency Project (WMEP) 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 will consider public comments prior to making any final decision on the issuance of the requested MMPA authorizations and agency responses will be summarized in the final notice of our decision.

DATES: Comments and information must be received no later than May 30, 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.Pauline@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: Rob Pauline, 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: *www.nmfs.noaa.gov/pr/permits/incidental/construction.htm.* In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

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 authorization is provided to the public for review.

An authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth.

NMFS has defined ''negligible impact'' in 50 CFR 216.103 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.

The MMPA states that the term ''take'' means to harass, hunt, capture, kill or attempt to harass, hunt, capture, or kill any marine mammal.

Except with respect to certain activities not pertinent here, 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).

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 February 1, 2018, NMFS received a request from Chevron for an IHA to take marine mammals incidental to pile driving and pile removal associated with the WMEP in San Francisco Bay, California. Chevron's request is for take of seven species by Level B and Level A harassment. Neither Chevron nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

NMFS previously issued an IHA to Chevron for similar work (82 FR 27240; June 17, 2017). However, the construction schedule and scope was revised and no work was conducted under that IHA. The revised schedule includes the use of piles that were not planned for use under the existing IHA. Therefore, a new IHA is required. This proposed IHA would cover one year of a larger project for which Chevron intends to request additional take authorizations for subsequent facets of the project.

Description of Proposed Activity

Overview

Chevron's Richmond Refinery Long Wharf (Long Wharf) located in San Francisco Bay, is the largest marine oil terminal in California. The Long Wharf has existed in its current location since

the early 1900s (Figure 1–1 in Application). The existing configuration of these systems have limitations to accepting more modern, fuel efficient vessels with shorter parallel mid-body hulls and in some cases do not meet current MOTEMS requirements. The purpose of the proposed WMEP is to comply with current MOTEMS requirements and to improve safety and efficiency at the Long Wharf.

Impact and vibratory pile driving and removal will be employed during the proposed construction project. These actions could produce underwater sound at levels that could result in the injury or behavioral harassment of marine mammal species. Underwater construction activities would occur between June 1, 2018 and November 30, 2018.

Dates and Duration

Construction activities would start in 2018, and be complete by the fourth quarter 2022. Pile driving activities would be timed to occur within the standard NMFS work windows for Endangered Species Act (ESA)-listed fish species (June 1 through November 30) over multiple years. An estimated 28 days of pile driving activity are planned for 2018. Additional work in the future will require subsequent IHAs. The IHA would be effective from June 1, 2018 through May 31, 2019.

Specific Geographic Region

The Long Wharf is located in San Francisco Bay (the Bay) just south of the eastern terminus of the Richmond-San Rafael Bridge (RSRB) in Contra Costa County. The wharf is located in the northern portion of the central bay, which is generally defined as the area between the RSRB, Golden Gate Bridge, and San Francisco-Oakland Bay Bridge (SFOBB).

Detailed Description of Specific Activity

The proposed project would involve modifications at four berths (Berths 1, 2, 3, and 4). Modifications to the Long Wharf include replacing gangways and cranes, adding new mooring hooks and standoff fenders, adding new dolphins and catwalks, and modifying the fire water system at Berths 1, 2, 3 and/or 4, as well as the seismic retrofit to the Berth 4 loading platform. The type and numbers of piles to be installed, as well as those that will be removed during the 2018–2022 period are summarized in Table 1. This work would be covered under multiple IHAs.

The combined modifications to Berths 1 to 4 would require the installation of 141 new concrete piles to support new and replacement equipment and their associated structures. The Berth 4 loading platform would add eight, 60-inch diameter steel piles as part of the seismic retrofit. The project would also add four clusters of 13 composite piles each (52 total) as markers and protection of the new batter (driven at an angle) piles on the east side of the Berth 4 retrofit. The project would remove 106 existing timber piles, two existing 18-inch and two existing 24-inch concrete piles. A total of 12 temporary piles would also be installed and removed during the seismic retrofit of Berth 4.

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Table 1. Planned Pile Installation and Removal for Entire Project 2018-2022.

Item		Description	No. Piles	Pile Installation / Removal Method
New Installation	1	Berth 1 Mooring Hook Dolphin	13	Impact
	2	Berth 1 Outer Breasting Dolphin	17	Impact
	3	Berth 1 Inner Breasting Point	8	Impact
	4	Berth 1 Gangway	4	Impact
	5	Berth 1 Walkways	0	-
	6	Berth 2 South Outside Fender	10	Impact
	7	Berth 2 South Inside Fender	10	Impact
	8	Berth 2 North Inside Fender	9	Impact
	9	Berth 2 North Outside Fender	10	Impact
	10	Berth 2 Main Hose Crane	4	Impact
	11	Berth 2 Aux Crane	4	Impact
	12	Berth 2 Vapor Recovery Hose Crane	0	-
	13	Berth 2 Gangway	4	Impact
	14	Berth 3 Gangway	4	Impact
	15	Berth 4 South Breasting Dolphin	22	Impact
	16	Berth 4 North Breasting Dolphin	22	Impact
	17	Berth 4 Walkways	0	-
		Total 24-inch Square Concrete Piles	**141**	
	18	Berth 4 Loading Platform Retrofit (60-inch-diameter Steel Piles)	8	Impact
	19	Berth 4 Barrier Piles (4 Clusters of 13 Composite Piles)	52	Vibrate
		Total Additional Fill	**201**	
Permanent Removal	20	Berth 1 Pile Removal	-2	Vibrate
	21	Berth 2 Pile Removal (106 Wooden - Actual Count)	-106	Vibrate
	22	Berth 2 Whaler Removal (excluding wooden Piles)	-	-
	23	Berth 2 Brace Piles (22-inch Square Concrete Jacketed Timber Piles)	-3	Cut
	24	Berth 4 Concrete Pile Removal	-2	Cut
	25	Berth 1 Existing Walkway	-	-
		Total Removal	**-113**	
		Net Change	**88**	**-**
Temporary Fill	26	Berth 1 Pile Removal	36	Vibrate
	27	Berth 2 Pile Removal (106 Wooden - Actual Count)	-	-
	28	Berth 2 Whaler Removal (excluding wooden Piles)	12	Vibrate

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Completion of the modifications will require cutting holes in the concrete decking of the Wharf to allow piles to be driven. The removal of structures and portion of concrete decking may involve the use of jackhammers to break up concrete, torches to cut metal, and various cutting and grinding power tools. This work will occur at various times throughout the construction schedule. When there is potential for construction debris to fall into the water below the Wharf, temporary work platforms will be used to capture debris. A typical debris catchment system that has been previously used at the Wharf consists of a platform suspended beneath the deck or in some cases a smaller platform immediately below the work area, and a second larger platform beneath that. Debris that falls on the platform is collected and disposed of in an appropriate manner.

Planned modifications at Berth 1 include replacing a gangway to accommodate barges and add a new raised fire monitor; constructing a new 24foot (ft) x 20ft mooring dolphin and hook to accommodate barges and; constructing a new 24ft x 25ft breasting dolphin and 13ft x 26ft breasting point with standoff fenders to accommodate barges. The new breasting dolphin will require removal of an existing catwalk and two piles and replacing with a new catwalk at a slightly different location, and adding a short catwalk to provide access to the breasting dolphin. A portion of the existing gangway will be removed. The remaining portion is used for other existing services located on its structure. Much of this work will be above the water or on the Wharf deck. The mooring dolphin and hook, breasting dolphin, and new gangway will require installation of 42 new 24-inch square concrete piles using impact driving methods.

Planned modifications at Berth 2 include installing a new gangway to replace portable gangway and add a new elevated fire monitor; replacing one bollard with a new hook; installing four new standoff fenders (to replace timber fender pile system); replacing existing auxiliary and hose cranes and vapor recovery crane to accommodate the new standoff fenders, and; removing the

existing timber fender pile system along the length of the Berth (~650ft).

Three (3) existing brace piles (22-inch square concrete jacketed timber piles) would be removed by cutting below the mud line if possible. These modifications will require the installation of 51 new 24-inch square concrete piles, using impact driving methods, to support the gangway, standoff fenders, hose crane, and auxiliary crane. To keep Berth 2 operational during construction, four temporary ''Yokohama'' fenders will be installed, supported by 36 temporary 14-inch H-piles driven using vibratory methods. It is expected that the H-piles would largely sink under their own weight and would require very little driving. The H-piles and temporary fenders will be removed once the permanent standoff fenders are complete. The auxiliary and hose cranes are being replaced with cranes with longer reach to accommodate the additional distance of the new standoff fenders. The new vapor recovery crane would be mounted on an existing pedestal and not require in-water work.

Planned modifications at Berth 3 include installing new fixed gangway to replace portable gangway and add a new raised fire monitor. The gangway would be supported by four, 24-inch square concrete piles. This would be the only in-water work for modifications at Berth 3.

Planned modifications at Berth 4 include installing two new 36ft x 20ft dolphins with standoff fenders (two per dolphin) and two catwalks as well as seismically retrofitting the Berth 4 loading platform including bolstering and relocation of piping and electrical facilities. The new fenders would add 44 new 24-inch square concrete piles. The seismic retrofit would structurally stiffen the Berth 4 Loading Platform under seismic loads. This will require cutting holes in the concrete decking and driving eight, 60-inch diameter hollow steel batter (angled) piles, using impact pile driving. To accommodate the new retrofit, an existing sump will be replaced with a new sump and two, 24-inch square concrete piles will be removed or cut to the mudline. To drive the 60-inch batter piles, eight temporary steel piles, 36 inches in diameter, will be needed to support templates for the batter piles during driving. Two templates are required, each 24ft by 4ft and supported by up to four 36-inch steel pipe piles. The templates will be above water.

The proposed project would also add 4 clusters of 13 composite piles each (52 total composite piles) as markers and protection of the new batter piles on the east side of the retrofit.

Note that the proposed IHA will only cover pile driving and removal that will occur during the 2018 work season, as provided in Table 2.

TABLE 2—PILE DRIVING SUMMARY FOR 2018 WORK SEASON

Pile type	Pile driver type	Number of piles	Number of driving days
36-inch steel template pile	Vibratory	8	2
Concrete pile removal	Vibratory	5	1
24-inch concrete	Impact	8	8
14-inch H pile installation (for temporary fenders)	Vibratory/Impact *	36	12
Timber pile removal	Vibratory	53	5

* A vibratory driver will be preferentially used for installation of the temporary H piles. In the event that the pile hits a buried obstruction and can no longer be advanced with a vibratory driver, and impact hammer may be used.

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; *www.nmfs.noaa.gov/pr/sars/*) and more general information about these species (*e.g.,* physical and behavioral descriptions) may be found on NMFS's website

Table 3 lists all species with expected potential for occurrence in the Bay near the project area 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 Committee on Taxonomy (2016). 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 no mortality is anticipated or authorized 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. Pacific Marine Mammal Stock Assessments: 2016 (Carretta *et al.,* 2017). All values presented in Table 3 are the most recent available at the time of publication and are available at *http://www.nmfs.noaa.gov/pr/sars/species.htm.*

TABLE 3—MARINE MAMMALS POTENTIALLY PRESENT IN THE VICINITY OF THE PROJECT AREA

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 Balaenidae						
Humpback whale	*Megaptera novaeangliae*	California//stock	E/D; (Y)	1,918 (0.03, 1,876, 2014)	11.0	≥6.5
Family Delphinidae						
Bottlenose dolphin	*Tursiops truncatus*	California Coastal	-/-; (N)	453 (0.06, 346, 2011)	2.7	≥2.0
Family Phocoenidae (porpoises)						
Harbor porpoise	*Phocoena Phocoena*	San Francisco-Russian River Stock.	-/-; (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*	Eastern U.S. stock	-/-; (N)	296,750 (-, 153,337, 2011).	9,200	389
Steller sea lion	*Eumetopias jubatus*	Eastern U.S. stock	-/-; (N)	41,638 (-, 41,638, 2015)	2,498	108
Northern fur seal	*Callorhinus ursinus*	California stock	-/-; (N)	14,050 (-, 7,524, 2013)	451	1.8
Family Phocidae (earless seals)						
Pacific harbor seal	*Phoca vitulina*	California stock	-/-; (N)	30,968 (-, 27,348, 2012)	1,641	43
Northern elephant seal	*Mirounga angustirostris*	California Breeding stock	-/-; (N)	179,000 (-, 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: *www.nmfs.noaa.gov/pr/sars/.* CV is coefficient of variation; N_{min} is the minimum estimate of stock abundance. In some cases, CV is not applicable [explain if this is the case]

[3] These values, found in NMFS's 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 proposed survey areas are included in Table 3. However, the temporal and/or spatial occurrence of humpback whales and Steller sea lions is such that take is not expected to occur, and they are not discussed further beyond the explanation provided here.

Although 35 species of marine mammals can be found off the coast of California, few species venture into San Francisco Bay, and only Pacific harbor seals, California sea lions, and harbor porpoises, make the Bay a permanent home. Small numbers of gray whales are regularly sighted in the Bay during their yearly migration, though most sightings tend to occur in the Central Bay near the Golden Gate Bridge. Bottlenose dolphins may also occasionally occur within San Francisco Bay.

Humpback whales are rare, though well-publicized, visitors to the interior of San Francisco Bay. A humpback whale journeyed through the Bay and up the Sacramento River in 1985 and re-entered the Bay in the fall of 1990, stranding on mudflats near Candlestick Park (Fimrite 2005). In May 2007, a humpback whale mother and calf spent just over two weeks in San Francisco Bay and the Sacramento River before finding their way back out to sea. Although it is possible that a humpback whale will enter the Bay and find its way into the project area during construction activities, their occurrence is unlikely. Similarly, the Steller sea lions are rare visitors to San Francisco Bay and is not expected to occur in the project area during construction. As a result, this species is not considered further.

Pacific Harbor Seal

The Pacific harbor seal is one of five subspecies of *Phoca vitulina,* or the common harbor seal. They are a true seal, with a rounded head and visible ear canal, distinct from the eared seals, or sea lions, which have a pointed head and an external ear. Although generally solitary in the water, harbor seals come ashore at ''haulouts''—shoreline areas where pinnipeds congregate to rest, socialize, breed, and molt—that are used for resting, thermoregulation, birthing, and nursing pups. Haul-out sites are relatively consistent from year to year (Kopec and Harvey 1995), and females have been recorded returning to their own natal haulout when breeding (Green *et al.,* 2006). The nearest haulout site to the project site is Castro Rocks, approximately 650 meters (m) north of the northernmost point on the Long Wharf.

The haulout sites at Mowry Slough (~55 kilometers (km) distant from project site), in the South Bay, Corte Madera Marsh (~8 km distant) and Castro Rocks (~650 m distant), in the northern portion of the Central Bay, and Yerba Buena Island (~12 km distant) in the Central Bay, support the largest concentrations of harbor seals within the San Francisco Bay. The California Department of Transportation (Caltrans) conducted marine mammal surveys before and during seismic retrofit work

on the RSRB in northern San Francisco Bay. The RSRB is located north of the project site, The surveys included extensive monitoring of marine mammals at points throughout the Bay. Although the study focused on harbor seals hauled out at Castro Rocks and Red Rock Island near the RSRB, all other observed marine mammals were recorded. Monitoring took place from May 1998 to February 2002 (Green *et al.,* 2002) and determined that at least 500 harbor seals populate San Francisco Bay. This estimate agrees with previous seal counts in San Francisco Bay, which ranged from 524 to 641 seals from 1987 to 1999 (Goals Project 2000).

Although births of harbor seals have not been observed at Corte Madera Marsh and Yerba Buena Island, a few pups have been seen at these sites. The main pupping areas in the San Francisco Bay are at Mowry Slough and Castro Rocks (Caltrans 2012). Seals haul out year-round on Castro Rocks during medium to low tides; few low tide sites are available within San Francisco Bay. The seals at Castro Rocks are habituated, to a degree, to some sources of human disturbance such as large tanker traffic and the noise from vehicle traffic on the bridge, but often flush into the water when small boats maneuver close by or when people work on the bridge (Kopec and Harvey 1995). Long-term monitoring studies have been conducted at the largest harbor seal colonies in Point Reyes National Seashore (~45 km west of the project site on Pacific coast) and Golden Gate National Recreation Area (~15 km southwest of the project site) since 1976. Castro Rocks and other haul-outs in San Francisco Bay are part of the regional survey area for this study and have been included in annual survey efforts. Between 2007 and 2012, the average number of adults observed at Castro Rocks ranged from 126 to 166 during the breeding season (March through May) and from 92 to 129 during the molting season (June through July) (Truchinski *et al.,* 2008, Flynn *et al.,* 2009, Codde *et al.,* 2010, Codde *et al.,* 2011, Codde *et al.* 2012, Codde and Allen 2013).

California Sea Lion

The California sea lion belongs to the family Otariidae or ''eared seals,'' referring to the external ear flaps not shared by other pinniped families. While California sea lions forage and conduct many activities within the water, they also use haulouts. California sea lions breed in Southern California and along the Channel Islands during the spring.

In the Bay, sea lions haul out primarily on floating docks at Pier 39 in the Fisherman's Wharf area of the San Francisco Marina, approximately 12.5 km southwest of the project site. The California sea lions usually arrive at Pier 39 in August after returning from the Channel Islands (Caltrans 2013). In addition to the Pier 39 haulout, California sea lions haulout on buoys and similar structures throughout the Bay. They are seen swimming off mainly the San Francisco and Marin County shorelines within the Bay but may occasionally enter the project area to forage. Over the monitoring period for the RSRB, monitors sighted California sea lions on 90 occasions in the northern portion of the Central Bay and at least 57 times in the Central Bay. No pupping activity has been observed at this site or at other locations within the San Francisco Bay (Caltrans 2012).

Although there is little information regarding the foraging behavior of the California sea lion in the San Francisco Bay, they have been observed foraging on a regular basis in the shipping channel south of Yerba Buena Island. Because California sea lions forage over a wide range in San Francisco Bay, it is possible that a limited number of individuals would be incidentally harassed during construction.

Harbor Porpoise

The harbor porpoise is a member of the Phocoenidae family. They generally occur in groups of two to five individuals, and are considered to be shy, relatively nonsocial animals.

In prior years, harbor porpoises were observed primarily outside of San Francisco Bay. The few harbor porpoises that entered did not venture far into the Bay. No harbor porpoises were observed during marine mammal monitoring conducted before and during seismic retrofit work on the RSRB. In recent years, there have been increasingly common observations of harbor porpoises within San Francisco Bay. According to observations by the Golden Gate Cetacean Research team, as part of their multi-year assessment, approximately 650 harbor porpoises have been observed in the San Francisco Bay, and up to 100 may occur on a single day (Golden Gate Cetacean Research 2017). In San Francisco Bay, harbor porpoises are concentrated in the vicinity of the Golden Gate Bridge (approximately 12 km southwest of the project site) and Angel Island (5.5 km southwest), with lesser numbers sighted in the vicinity of Alcatraz (11 km south) and west of Treasure Island (10 km southeast) (Keener 2011). Because this species may venture into the Bay east of Angel Island, there is a slight chance that a small number of individuals could occur in the vicinity of the proposed project.

Gray Whale

Gray whales are large baleen whales. 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. They feed in northern waters primarily off the Bering, Chukchi, and western Beaufort seas during the summer, before heading south to the breeding and calving grounds off Mexico over the winter. Between December and January, late-stage pregnant females, adult males, and immature females and males will migrate southward. The northward migration peaks between February and March. During this time, recently pregnant females, adult males, immature females, and females with calves move north to the feeding grounds (NOAA 2003). A few individuals will enter into the San Francisco Bay during their northward migration.

RSRB project monitors recorded 12 living and 2 dead gray whales, all in either the Central Bay or San Pablo Bay, and all but 2 sightings occurred during the months of April and May (Winning 2008). One gray whale was sighted in June and one in October (the specific years were unreported). The Oceanic Society has tracked gray whale sightings since they began returning to the Bay regularly in the late 1990s. The Oceanic Society data show that all age classes of gray whales are entering the Bay and that they enter as singles or in groups of up to five individuals. However, the data do not distinguish between sightings of gray whales and number of individual whales (Winning 2008). It is possible that a small number of gray whales enter the Bay in any given year, typically from March to May. However, this is outside of the June to November window when pile driving would occur.

Bottlenose Dolphin

The range of the bottlenose dolphin has expanded northward along the Pacific Coast since the 1982–1983 El Niño (Carretta *et al.,* 2013; Wells and Baldridge 1990). They have been observed along the coast in Half Moon Bay, San Mateo, Ocean Beach in San Francisco, and Rodeo Beach in Marin County. Observations indicate that bottlenose dolphin occasionally enter San Francisco Bay, sometimes foraging for fish in Fort Point Cove, just east of the Golden Gate Bridge (Golden Gate Cetacean Research 2014). While individuals of this species occasionally enter San Francisco Bay, observations indicate that they generally remain in

proximity to the Golden Gate near the mouth of the Bay. However, a limited number may approach the project area during in-water construction.

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 (2016) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 decibels (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 hertz (Hz) and 35 kilohertz (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 (2016) 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 activities. Please refer to Table 3. Of the cetacean species that may be present, one is classified as low-frequency cetaceans (*i.e.,* gray whale), one is classified as mid-frequency cetaceans (*i.e.,* bottlenose dolphin), and one is classified as high-frequency cetaceans (*i.e.,* harbor porpoise).

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 by Incidental Harassment'' 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 by Incidental Harassment'' 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 Sources

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 and attenuate (decrease) more rapidly in shallower water. 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 1 micro pascal (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 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; and
- *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.

In-water construction activities associated with the project would include impact pile driving, vibratory pile driving and vibratory pile extraction. The sounds produced by these activities fall into one of two general sound types: Pulsed and non-pulsed (defined in the following paragraphs). 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.

Pulsed 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; ISO, 2003) and occur either as isolated events or repeated in some succession. Pulsed 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-pulsed sounds can be tonal, narrowband, or broadband, brief or prolonged, and may be either continuous or non-continuous (ANSI, 1995; NIOSH, 1998). Some of these non-pulsed sounds can be transient signals of short duration but without the essential properties of pulses (*e.g.,* rapid rise time). Examples of non-pulsed sounds include those produced by vessels, aircraft, machinery operations such as drilling, vibratory pile driving, and active sonar systems (such as those used by the U.S. Navy). 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).

Acoustic Impacts

Please refer to the information given previously (*Description of Sound Sources*) regarding sound, characteristics of sound types, and metrics used in this document. 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: 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). 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. In this section, we first describe specific manifestations of acoustic effects before providing discussion specific to the proposed construction activities in the next section.

Permanent Threshold Shift—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) 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 impulse sounds (such as impact pile driving pulses as received close to the source) are at least six 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).

Temporary threshold shift—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.

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 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, 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 Southall *et al.* (2007), Finneran and Jenkins (2012), and Finneran (2015).

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 pulsed 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, 2003). 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 vary 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, 2005b, 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 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.,* 2007b). 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 as a result 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).

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.

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).

Auditory masking—Sound can disrupt behavior through masking, or interfering with, an animal's ability to detect, recognize, or discriminate between acoustic signals of interest (*e.g.,* those used for intraspecific communication and social interactions, prey detection, predator avoidance, navigation) (Richardson *et al.,* 1995). Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher intensity, and may occur whether the sound is natural (*e.g.,* snapping shrimp, wind, waves, precipitation) or anthropogenic (*e.g.,* shipping, sonar, seismic exploration) in origin. The ability of a noise source to mask biologically important sounds depends on the characteristics of both the noise source and the signal of interest (*e.g.,* signal-to-noise ratio, temporal variability, direction), in relation to each other and to an animal's hearing abilities (*e.g.,* sensitivity, frequency range, critical ratios, frequency discrimination, directional discrimination, age or TTS hearing loss), and existing ambient noise and propagation conditions.

Under certain circumstances, marine mammals experiencing significant masking could also be impaired from maximizing their performance fitness in survival and reproduction. Therefore, when the coincident (masking) sound is man-made, it may be considered harassment when disrupting or altering critical behaviors. It is important to distinguish TTS and PTS, which persist after the sound exposure, from masking, which occurs during the sound exposure. Because masking (without resulting in TS) is not associated with abnormal physiological function, it is not considered a physiological effect, but rather a potential behavioral effect.

The frequency range of the potentially masking sound is important in determining any potential behavioral impacts. For example, low-frequency signals may have less effect on high-frequency echolocation sounds produced by odontocetes but are more likely to affect detection of mysticete communication calls and other potentially important natural sounds such as those produced by surf and some prey species. The masking of communication signals by anthropogenic noise may be considered as a reduction in the communication space of animals (*e.g.,* Clark *et al.,* 2009) and may result in energetic or other costs as animals change their vocalization behavior (*e.g.,* Miller *et al.,* 2000; Foote *et al.,* 2004; Parks *et al.,* 2007b; Di Iorio and Clark 2009; Holt *et al.,* 2009). Masking can be reduced in situations where the signal and noise come from different directions (Richardson *et al.,* 1995), through amplitude modulation of the signal, or through other compensatory behaviors (Houser and Moore 2014). Masking can be tested directly in captive species (*e.g.,* Erbe, 2008), but in wild populations it must be either modeled or inferred from evidence of masking compensation. There are few studies addressing real-world masking sounds likely to be experienced by marine mammals in the wild (*e.g.,* Branstetter *et al.,* 2013).

Masking affects both senders and receivers of acoustic signals and can potentially have long-term chronic effects on marine mammals at the population level as well as at the individual level. Low-frequency ambient sound levels have increased by as much as 20 dB (more than three times in terms of SPL) in the world's ocean from pre-industrial periods, with most of the increase from distant commercial shipping (Hildebrand, 2009). All anthropogenic sound sources, but especially chronic and lower-frequency signals (*e.g.,* from vessel traffic), contribute to elevated ambient sound levels, thus intensifying masking.

Non-auditory physiological effects—Non-auditory physiological effects or injuries that theoretically might occur in marine mammals exposed to strong underwater sound include stress, neurological effects, bubble formation, resonance effects, and other types of organ or tissue damage (Cox *et al.,* 2006; Southall *et al.,* 2007). Studies examining such effects are limited. In general, little is known about the potential for pile driving to cause auditory impairment or other physical effects in marine mammals. Available data suggest that such effects, if they occur at all, would presumably be limited to short distances from the sound source, where SLs are much higher, and to activities that extend over a prolonged period. The available data do not allow identification of a specific exposure level above which non-auditory effects can be expected (Southall *et al.,* 2007) or any meaningful quantitative predictions of the numbers (if any) of marine mammals that might be affected in those ways. However, the proposed activities do not involve the use of devices such as explosives or mid-frequency active sonar that are associated with these types of effects. Therefore, non-auditory physiological

impacts to marine mammals are considered unlikely.

Disturbance Reactions—Responses to continuous sound, such as vibratory pile installation, have not been documented as well as responses to pulsed sounds. With both types of pile driving, it is likely that the onset of pile driving could result in temporary, short term changes in an animal's typical behavior and/or avoidance of the affected area. Specific behavioral changes that may result from this proposed project include changing durations of surfacing and dives, moving direction and/or speed; 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); and avoidance of areas where sound sources are located. 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, potential impacts on the stock or species could potentially be significant if growth, survival and reproduction are affected (*e.g.,* Lusseau and Bejder, 2007; Weilgart, 2007). Note that the significance of many of these behavioral disturbances is difficult to predict, especially if the detected disturbances appear minor.

Airborne Acoustic Effects from the Proposed Activities—Pinnipeds that occur near the project site could be exposed to airborne sounds associated with pile driving 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 heads above water. Most likely, airborne sound would cause behavioral responses similar to those discussed above in relation to underwater sound. However, these animals would previously have been ''taken'' as a result 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 is already accounted for in these estimates of potential take. Multiple instances of exposure to sound above NMFS' thresholds for behavioral harassment are not believed to result in increased behavioral disturbance, in either nature or intensity of disturbance reaction.

Potential Pile Driving Effects on Prey—Construction activities would produce continuous (*i.e.,* vibratory pile driving) sounds and pulsed (*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 pulses 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 activities at the project area would be temporary behavioral avoidance within an undetermined portion of the affected 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 from the proposed project are expected to be minor and temporary due to the relatively short and intermittent timeframe (up to 28 driving days over 6 months) of pile driving and extraction.

Effects to Foraging Habitat—Pile installation may temporarily impact foraging habitat by increasing turbidity resulting from suspended sediments. Any increases would be temporary, localized, and minimal. The contractor must comply with state water quality standards during these operations by limiting the extent of turbidity to the immediate project area. In general, turbidity associated with pile installation is localized to about a 25ft radius around the pile (Everitt *et al.,* 1980). Furthermore, water quality impacts are expected to be negligible because the project area occurs in a high energy, dynamic area with strong tidal currents. Cetaceans are not expected to be close enough to the project pile driving areas to experience effects of turbidity, and any pinnipeds in the area could avoid localized areas of turbidity. Therefore, the impact from increased turbidity levels is expected to be discountable to marine mammals.

It is important to note that pile driving and removal activities at the project site will not obstruct movements or migration of marine mammals.

In summary, given the relatively short (28 days) and intermittent nature of sound associated with individual pile driving and extraction events and the relatively small area that would be affected, pile driving 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 primarily be by Level B harassment, as use of the acoustic source (*i.e.,* pile driving) has the potential to result in disruption of behavioral patterns for individual marine mammals. There is also some potential for auditory injury (Level A harassment) to result, primarily for high frequency species and a single phocid species due to larger predicted auditory injury zones. Auditory injury is unlikely to occur for low-frequency, mid-frequency species, or pinniped groups, with the exception of harbor seals. The proposed mitigation and monitoring measures are expected to minimize the

severity of such taking to the extent practicable.

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

Described in the most basic way, 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. 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.,* 2011). 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.,* seismic airguns) or intermittent (*e.g.,* scientific sonar) sources. For in-air sounds, NMFS predicts that pinnipeds exposed above received levels of 100 dB re 20 µPa (rms) will be behaviorally harassed.

Chevron's proposed activity includes the use of continuous (vibratory driving) and impulsive (impact driving) sources, and therefore the 120 and160 dB re 1 µPa (rms) are applicable.

Level A harassment for non-explosive sources—NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Technical Guidance, 2016) 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). Applicant's proposed activity includes the use of impulsive (impact driving) and non-impulsive (vibratory driving) sources.

These thresholds are provided in Table 4. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2016 Technical Guidance, which may be accessed at: *http://www.nmfs.noaa.gov/pr/acoustics/guidelines.htm.*

TABLE 4—THRESHOLDS IDENTIFYING THE ONSET OF PERMANENT THRESHOLD SHIFT

Hearing group	PTS Onset acoustic thresholds * (received level)	
	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.

Ensonified Area

Here, we describe operational and environmental parameters of the activity that will feed into identifying the area ensonified above the acoustic thresholds.

Pile driving will generate underwater noise that potentially could result in disturbance to marine mammals swimming by the project area. Transmission loss (TL) underwater is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source until the source becomes indistinguishable from ambient sound. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. A standard sound propagation model, the Practical Spreading Loss model, was used to estimate the range from pile driving activity to various expected SPLs at potential project structures. This model follows a geometric propagation loss based on the distance from the driven pile, resulting in a 4.5 dB reduction in level for each doubling of distance from the source. In this model, the SPL at some distance away from the source (*e.g.,* driven pile) is governed by a measured source level, minus the TL of the energy as it dissipates with distance. The TL equation is:

$$TL = 15\log10(R_1/R_2)$$

Where:

TL is the transmission loss in dB,

R_1 is the distance of the modeled SPL from the driven pile, and
R_2 is the distance from the driven pile of the initial measurement.

The degree to which underwater noise propagates away from a noise source is dependent on a variety of factors, most notably by the water bathymetry and presence or absence of reflective or absorptive conditions including the sea surface and sediment type. The TL model described above was used to calculate the expected noise propagation from both impact and vibratory pile driving, using representative source levels to estimate the zone of influence (ZOI) or area exceeding specified noise criteria.

Source Levels

Sound source levels from the Chevron site were not available. Therefore, literature values published for projects similar to the Chevron project were used to estimate source levels that could potentially be produced. Results are shown in Table 5.

Modifications at the four berths require the placement of new 24-inch diameter square concrete piles. Approximately one to two of these piles would be installed in one workday, using impact driving methods. Based on measured blow counts for 24-inch concrete piles driven at the Long Wharf Berth 4 in 2011, installation for each pile could require up to approximately 300 blows and 1.5 second per blow average over a duration of approximately 20 minutes per pile, with 40 minutes of pile driving time per day if two piles are installed. To estimate the noise effects of the 24-inch square concrete piles, the general values provided by Caltrans (2015a) are shown in Table 5.

To estimate the noise effects of impact driving of 14-inch steel H piles, the values provided by Caltrans were also utilized. These source values are 208 dB peak, 187 RMS, and 177 dB SEL(single strike). Based on these levels, impact driving of the 14-inch steel H piles is expected to produce underwater sound exceeded the Level B 160 dB RMS threshold over a distance of 631 meters.

During construction, temporary fendering would be installed at Berth 2 which will be supported by thirty-six steel 14-inch steel H piles. It is estimated that each pile could be driven in five (5) minutes. Two (2) to four (4) piles would be installed in any single workday for a total of approximately 12 days of installation. For the purposes of calculating the distance to Level A thresholds, four piles per day is assumed. The piles would be removed after the permanent fenders are in place. A vibratory hammer would be used to vibrate the piles to facilitate pulling them from the mud. The best match for estimated source levels is the Port of Anchorage pile driving test project. During vibratory pile driving associated with the Anchorage project, peak noise levels ranged from 165 to 175 dB, and the RMS ranged between 152 and 168 dB, both measured at approximately 15 meters (50 ft) (Caltrans 2015a).

The source levels for vibratory installation of 36-inch temporary steel piles were from the Explosive Handling Wharf-2 (EHW–2) project located at the Naval Base Kitsap in Bangor, Washington as stated in Caltrans (2015a). During vibratory pile driving measured peak noise levels were approximately 180 dB, and the RMS was approximately 169 dB at a 10 meter (33ft) distance. These temporary piles would require a drive time per pile of approximately 10 minutes. Up to four (4) of these piles could be installed in any single workday for a total of 40 minutes.

The most applicable source values for wooden pile removal were derived from measurements taken at the Port Townsend dolphin pile removal in Washington. During vibratory pile extraction associated with this project, which occurred under similar circumstances, measured peak noise levels were approximately 164 dB, and the RMS was approximately 150 dB (WSDOT 2011). Applicable sound values for the removal of concrete piles could not be located, but they are expected to be similar to the levels produced by wooden piles described above, as they are similarly sized, non-metallic, and will be removed using the same methods.

During construction, 106 16-inch timber piles, and seven 18 to 24-inch square concrete piles would be removed. Up to twelve of these piles could be extracted in one workday. Extraction time needed for each pile may vary greatly, but could require approximately 400 seconds (approximately 7 minutes).

TABLE 5—THE SOUND LEVELS (dB PEAK, dB RMS, AND dB SSEL) EXPECTED TO BE GENERATED BY EACH HAMMER AND PILE TYPE

Type of pile	Hammer type	Estimated pressure level (dB Peak)	Estimated pressure Level (dB RMS)	Estimated single strike sound exposure level (dB sSEL)
24-inch sq. concrete	Impact	188	176	166
14-inch Temporary steel H-pile	Impact	208	187	177
14-inch Temporary steel H-pile	Vibratory	180	*168	.....
36-inch Steel Pipe	Vibratory	180	169	.....
Wood and concrete pile extraction	Vibratory	164	150	.....

*Measured at 15 m.

When NMFS Technical Guidance (2016) was published, in recognition of the fact that ensonified area/volume 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 degree of overestimate of Level A take. 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 NMFS 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.

Table 6 shows the inputs that were used in the User Spreadsheet to determine cumulative PTS Thresholds. Table 7 shows the Level A Isopleths as determined utilizing inputs from Table 6. Level B isopleths for impact and vibratory driving and extraction are shown in Table 8.

TABLE 6—INPUTS FOR USER SPREADSHEET

Spreadsheet tab used	E.1: Impact pile driving (stationary source: impulsive, intermittent)	E.1: Impact pile driving (stationary source: impulsive, intermittent)	A: Stationary source: non-impulsive, continuous	A: Stationary source: non-impulsive, continuous	A: Stationary source: non-impulsive, continuous
Pile Type and Hammer Type	24-inch sq. concrete piles.	14-inch Steel H pile.	14-inch Steel H pile.	36-in steel	Wood concrete pile extraction.
Source Level	166 (Single strike/shot SEL).	177 (Single strike/shot SEL).	168 RMS	169 RMS	150 RMS.
Weighting Factor Adjustment (kHz)	2	2	2.5	2.5	2.5.
Number of strikes in 1-h OR number of strikes per pile.	300	200	NA	NA	NA.
Activity Duration (h) within 24-h period OR number of piles per day.	2 piles	4 piles	0.333	0.6667	1.333.
Propagation (xLogR)	15	15	15	15	15.
Distance of source level measurement (meters);.	10	10	15	10	10.

TABLE 7—RADIAL DISTANCES TO LEVEL A ISOPLETH DURING IMPACT AND VIBRATORY DRIVING

Project element requiring pile installation	Distance in meters (feet)				
	Low-frequency cetaceans	Mid-frequency cetaceans	High-frequency cetaceans	Phocid pinnipeds	Otariid pinnipeds
Impact Driving:					
24 inch square concrete (1–2 per day)	52 (171)	2 (6)	62 (204)	28 (92)	2 (7)
14-inch steel H pile (4 per day)	343 (1,124)	12 (40)	408 (1,339)	183 (602)	13 (44)
Vibratory Driving/Extraction:					
14-inch steel H pile (4 per day)	14 (46)	1 (3)	21 (69)	9 (30)	1 (3)
36-inch steel pipe pile (4 per day)	18 (58)	2 (5)	26 (86)	11 (35)	1 (2)
Wood and concrete pile extraction (12 per day)	2 (5)	0 (0)	2 (7)	1 (3)	0 (0)

TABLE 8—RADIAL DISTANCES TO LEVEL B ISOPLETHS DURING IMPACT AND VIBRATORY DRIVING

Pile type	Distance to threshold in meters (feet)
Impact Driving (160 dB threshold):	
24-inch square concrete	117 (382)
14-inch steel H pile	631 (2,070)
Vibratory Driving/Extraction (120 dB threshold):	
14-inch steel H pile	23,773 (77,995)
36-inch steel pipe pile	18,478 (60,609)
Wood and concrete pile extraction	1,000 (3,280)

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.

San Francisco Bay has five known harbor seal haul out sites that include Alcatraz Island, Castro Rocks, Yerba Buena Island, Newark Slough, and Mowry Slough. Yerba Buena Island, Alcatraz and Castro Rocks are within or near the areas within ensonified Level B zones. Castro Rocks is the largest harbor seal haul out site in the northern part of San Francisco Bay and is the second largest pupping site in the Bay (Green *et al.* 2002). The pupping season is from March to June in San Francisco Bay. During the molting season (typically June–July and coincides with the period when piles will be driven) as many as approximately 130 harbor seals on average have been observed using Castro Rocks as a haul out. Harbor seals are more likely to be hauled out in the late afternoon and evening, and are more likely to be in the water during the morning and early afternoon (Green *et al.* 2002). However, during the molting season, harbor seals spend more time hauled out and tend to enter the water later in the evening. During molting, harbor seals can stay onshore resting for an average of 12 hours per day during the molt compared to around 7 hours per day outside of the pupping/molting seasons (NPS 2014). Tidal stage is a major controlling factor of haul out usage at Castro Rocks with more seals present during low tides than high tide periods (Green *et al.* 2002). Additionally, the number of seals

hauled out at Castro Rocks also varies with the time of day, with proportionally more animals hauled out during the nighttime hours (Green *et al.* 2002). Therefore, the number of harbor seals in the water around Castro Rocks will vary throughout the work period. The number of harbor seals located at Castro Rocks is based on the highest mean plus the standard error of harbor seals observed at Castro Rocks during recent annual surveys conducted by the National Park Service (NPS) (Codde, S. and S. Allen 2013, 2015, and 2017), resulting in a value of 176 seals. The same NPS survey determined that harbor seal population in the Central Bay at Alcatraz and Yerba Buena Island is approximately 167 seals (Codde, S. and S. Allen 2013, 2015, and 2017).

California sea lions haul out primarily on floating docks at Pier 39 in the Fisherman's Wharf area of the San Francisco Marina, approximately 12.5 km (7.8 miles) southwest of the project area. Based on counts done in 1997 and 1998, the number of California sea lions that haul out at Pier 39 fluctuates with the highest occurrences in August and the lowest in June. In addition to the Pier 39 haulout, California sea lions haul out on buoys and similar structures throughout the Bay. They are seen swimming off mainly the San Francisco and Marin shorelines within the Bay but may occasionally enter the project area to forage. Over the monitoring period for the RSRB, monitors sighted at least 90 California sea lions in the North Bay and at least 57 in the Central Bay (Caltrans 2012). During monitoring for the San Francisco-Oakland Bay Bridge (SFOBB) Project in the central Bay, 69 California sea lions were observed in the vicinity of the bridge over a 17-year period from 2000–2017 (Caltrans 2018), and from these observations, an estimated density of 0.161 animals per square kilometer (km^2) is derived (NMFS 2018).

A small but growing population of harbor porpoises utilizes San Francisco Bay. Harbor porpoises are typically spotted in the vicinity of Angel Island and the Golden Gate (6 and 12 km southwest respectively) with lesser numbers sighted in the vicinity of Alcatraz and around Treasure Island (Keener 2011). Porpoises but may utilize other areas in the Central Bay in low numbers, including the proposed project area. However, harbor porpoise are naturally inclined to remain near the shoreline areas and downstream of large landmasses as they are constantly foraging. For this reason, the project area would present a less than likely area to observe harbor porpoise as they would either need to traverse the perimeter of the Bay to arrive there, or would have to swim through the open Bay. Both scenarios are possible, but would represent uncmmon behavior. Based on monitoring conducted for the SFOBB project, between 2000–2017 an in-water density of 0.031 animals per km^2 estimated by Caltrans for this species. However, porpoise occurrence increased significantly in 2017 resulting in a 2017 only density of 0.167 animals per km^2 (Caltrans 2018).

Small numbers of northern elephant seals haul out or strand on coastline within the Central Bay. Monitoring of marine mammals in the vicinity of the SFOBB has been ongoing for 15 years; from those data, Caltrans has produced an estimated at-sea density for northern elephant seal of 0.06 animal per km^2 (Caltrans, 2015b). Most sightings of northern elephant seal in San Francisco Bay occur in spring or early summer, and are less likely to occur during the periods of in-water work for this project. As a result, densities during pile driving for the proposed action would be much lower.

The incidence of northern fur seal in San Francisco Bay depends largely on oceanic conditions, with animals more likely to strand during El Niño events. The likelihood of El Niño conditions occurring in 2018 is currently low, with La Niña or neutral conditions expected to develop (NOAA, 2018).

The range of the bottlenose dolphin has expanded northward along the Pacific Coast since the 1982–1983 El Niño (Carretta *et al.* 2013, Wells and Baldridge 1990). They now occur as far north as the San Francisco Bay region and have been observed along the coast in Half Moon Bay, San Mateo, Ocean Beach in San Francisco, and Rodeo Beach in Marin County. Observations indicate that bottlenose dolphin occasionally enter San Francisco Bay, sometimes foraging for fish in Fort Point Cove, just east of the Golden Gate Bridge (Golden Gate Cetacean Research 2014). Transient individuals of this species occasionally enter San Francisco Bay, but observations indicate that they usually remain in proximity to the Golden Gate near the mouth of the Bay. Beginning in 2015, two individuals have been observed frequently in the vicinity of Oyster Point, located south of San Francisco (GGCR, 2016; GGCR 2017; Perlman, 2017). Bottlenose dolphins are being observed in San Francisco Bay more frequently in recent years. Groups with an average size of five animals have been observed entering the Bay in the vicinity of Yerba Buena Island at a rate of once per week. They usually are observed over two week spans and then depart for an extended period of time. (NMFS, 2017b).

Gray whales occasionally enter the Bay during their northward migration period, and are most often sighted in the Bay between February and May. Most venture only about 2 to 3 km (about 1–2 miles) past the Golden Gate, but gray whales have occasionally been sighted as far north as San Pablo Bay. Pile driving is not expected to occur during this time, and gray whales are not likely to be present at other times of year.

Take Calculation and Estimation

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

The following assumptions are made when estimating potential incidences of take:

- All marine mammal individuals potentially available are assumed to be present within the relevant area, and thus incidentally taken;
- An individual can only be taken once during a 24-h period;
- Exposures to sound levels at or above the relevant thresholds equate to take, as defined by the MMPA.

Limited density data is available for marine mammal species in San Francisco Bay. Estimates here are determined using data taken during marine mammal monitoring associated with RSRB retrofit project, the San Francisco-Oakland Bay Bridge replacement project, and other marine mammal observations for San Francisco Bay. For Pacific harbor seal, data was also derived from recent annual surveys of haul outs in the Bay conducted by the National Park Service (Codde, S. and S. Allen. 2013, 2015, and 2017).

Pacific Harbor Seal

As noted above, take estimates are based on the highest mean plus the standard error of harbor seals observed by NPS at Castro Rocks which equals 176 animals. (Codde, S. and S. Allen. 2013, 2015, and 2017) Since pile driving would occur intermittently during the day, varying sets of animals may be hauled out or in the water. For simplicity, this analysis assumes that since harbor seals haul out for around 7 hours when not pupping/molting, 7/24 or 29 percent of the harbor seals would not be in the water during pile driving and would not be exposed. Thus, it is estimated that 71 percent of the 176 individuals (125 individuals) will be in the water at some point during each work day, and potentially exposed to underwater noise from pile driving. Of these 125 seals, the proportion that may enter the areas over which the Level B harassment

thresholds may be exceeded are estimated as follows:

• *Impact driving of 24-inch concrete piles at all Berths:* It is assumed that 10 percent of the animals that enter the water from Castro Rocks will enter the small Level B zones associated with this pile type as shown in Figure 6–1 in the application. Thus, it is estimated that up to 12.5 individuals per day could be exposed (125/10 = 12.5) by entering the Level B harassment zone to the south of Castro Rocks.

• *Impact driving of 14-inch steel H piles:* Impact driving would only occur in the event that a pile encounters an obstruction such as an old timber pile beneath the mud line. These piles will be preferentially driven with a vibratory driver, which would have a larger Level B zone but a smaller Level A zone than installation with an impact driver. Thus, Level B take for this activity is based on installation using vibratory driver, while Level A take is based on installation using impact driving. For the purposes of calculating Level A take, as a proportion of Level B take, it is assumed that approximately 25 percent of the 125 harbor seals using Castro Rocks could approach and be subject to Level B harassment due to the size and location of the Level B isopleth (Figure 6–2 in application). Therefore, it is assumed that up to 31.25 individuals per day could be exposed when this activity is being conducted.

• *Vibratory driving and removal of the 36-inch steel pipe piles at Berth 4:* Isopleths for this vibratory driving encompass Castro Rocks, therefore it is assumed that all of the estimated 125 animals in the water, could be exposed when these piles are being driven at Berth 4.

• *Vibratory driving/extraction of the 14-inch H piles at Berth 2:* Isopleths for this vibratory driving encompass Castro Rocks, therefore is assumed that all of the 125 animals in the water could be exposed when this activity is being conducted at Berth 2.

• *Vibratory removal of timber and concrete piles at Berths 1, 2 and 4:* Due to the small size of the Level B zone for this activity, fewer harbor seals are expected to be exposed to Level B harassment. It is assumed that approximately 25 percent of the 125 harbor seals using Castro Rocks could approach and be subject to Level B harassment. Therefore, it is assumed that up to 31.25 individuals per day could be exposed when this activity is being conducted.

In order to account for other individuals that may be foraging in the more distant part of the Level B harassment zone, additional take of harbor seal has been estimated based on other harbor seal populations in the Central Bay. Using the same data set (Codde, S. and S. Allen. 2013, 2015, and 2017) that was used for Castro Rocks, a population for the Central Bay of 167 harbor seals was established based on other Central Bay haulouts at Alcatraz and Yerba Buena Island. The area of the Central Bay (bound by the Golden Gate, Richmond Bridge, SFOBB, and adjoining coastline) is approximately 134 km^2, resulting in a harbor seal density of 1.25 animals per km^2. The population that hauls out at Castro Rocks is not included in this density estimate because of the proximity of the haul site to the project and potential take of those harbor seals has been estimated separately using the methods described above. The estimated take based on the Central Bay density is added to the take estimated for the Castro Rocks population, as provided in Table 9 below. Also provided in Table 9 is the estimated Level A take for impact driving of the steel 14-inch H piles, which has been estimated by taking Level B take and multiplying it by the ratio of the Level A zone area to the Level B zone area as requested by NMFS. Level A take is not requested for vibratory driving.

TABLE 9—DAILY LEVEL A AND LEVEL B HARASSMENT ESTIMATE FOR PACIFIC HARBOR SEAL

Pile type	Estimated Level B take per day					Estimated Level A take per day—total
	Level B zone (km^2)	Level A zone, minus exclusion zone (km^2)	Central bay [1] (1.25 per km^2)	Project vicinity [1]	Harbor seal—total	
Vibratory Driving:						
14-inch steel H pile	192.31	NA	239.55	125	364.55	NA
36-inch steel pile	176.44	NA	219.76	125	344.76	NA
Timber/Concrete Pile Removal	3.69	NA	4.59	31.25	35.84	NA
Impact Driving:						
14-inch steel H pile	1.36	0.10	*1.69	*31.25	*32.88	2.47
24-inch concrete pile	0.04	0	0.05	12.5	12.55	0

[1] Based on 71 percent of 176 individuals that haul out at Castro Rocks, approximately 1,000 m from project site.
* Only displayed to provide the calculation of Level A take. Level B take authorized for vibratory driving would cover any level B take from occasional impact driving.

For impact pile driving of the 14-inch steel H piles, the PTS Zone is large enough to warrant a smaller exclusion zone and the authorization of some Level A harassment for harbor seal so that pile driving can be completed on schedule. A 35 meter shutdown zone (smaller than the Level A Zone) for this species would be established, but individuals that place themselves in the Level A zone but outside of the shut-down zone may experience Level A harassment, if they reside in that area for a long enough duration.

California Sea Lion

The estimated California seal lion density of 0.16 animals per km^2 previously described was used to calculate potential Level B exposures as shown in Table 10.

TABLE 10—DAILY LEVEL B HARASSMENT EXPOSURE ESTIMATE FOR CALIFORNIA SEA LION

Pile type	Level B zone (km^2)	Level B Take estimate (based on Central Bay density of 0.16 animals per km^2)
Vibratory Driving:		
14-inch steel H pile	192.31	17.30
36-inch steel pile	176.44	15.88
Timber/Concrete Pile Removal	3.69	0.33
Impact Driving:		
14-inch steel H pile	NA	NA
24-inch concrete pile	0.17	0.02

Harbor Porpoise

Based on monitoring conducted for the SFOBB project described previously, an in-water density of 0.17 animals per km^2 was estimated by Caltrans for this species (NMFS 2017b). Using this in-water density and the areas of potential harassment, take is estimated for harbor porpoise as provided in Table 11. Also provided in Table 11 is the estimated Level A take for impact driving, which has been estimated by taking Level B take and multiplying it by the ratio of the Level A zone area to the Level B zone area. A single harbor porpoise could be exposed to Level A harassment during impact driving or 14-inch steel H-piles as shown in Table 13. NMFS, however, conservatively proposes to authorize Level A take of two animals.

TABLE 11—DAILY LEVEL A AND LEVEL B HARASSMENT ESTIMATE FOR PACIFIC HARBOR PORPOISE

Pile type	Level B zone (km^2)	Level A zone, minus exclusion zone (km^2)	Level B estimate central bay in-water—0.17 per km^2	Estimated Level A take per day
Vibratory Driving:				
14-inch steel H pile	192.31	.....	32.69	NA
36-inch steel pile	176.44	.....	29.99	NA
Timber/Concrete Pile Removal	3.69	.....	0.63	NA
Impact Driving:				
14-inch steel H pile	1.36	*0.32	*0.23	0.05
24-inch concrete pile	0.04	0	0.04	0

*Only displayed to provide the calculation of Level A take. Level B take authorized for vibratory driving would cover any Level B take from occasional impact driving.

For impact pile driving of the 14-inch H piles, the Level A Zone is large enough to warrant the authorization of some Level A. A 250 meter shutdown zone for this species would be established, but individuals that place themselves in the Level A zone but outside of the shut-down zone may experience Level A harassment, if they reside in that area for a long enough duration.

Northern Elephant Seal

Monitoring of marine mammals in the vicinity of the SFOBB has been ongoing for produced an estimated density for northern elephant seal of 0.06 animal per km^2 (Caltrans, 2015b). Most sightings of northern elephant seal in San Francisco Bay occur in spring or early summer, and are less likely to occur during the periods of in-water work for this project. As a result, densities during pile driving for the proposed action would be much lower. It is possible that a lone northern elephant seal may enter the Level B harassment area once per day during pile driving, for a total of 28 takes. Level A harassment of this species is not expected to occur and is not proposed by NMFS.

Northern Fur Seal

As noted previously, the incidence of northern fur seal in San Francisco Bay depends largely on oceanic conditions, with animals more likely to strand during El Niño events. The likelihood of El Niño conditions occurring in 2018 is currently low, with La Niña or neutral conditions expected to develop (NOAA, 2018). Given the low probability that fur seals would enter into the Bay and project area in 2018, Chevron has conservatively requested and NMFS is proposing authorization of 10 fur seals takes by Level B harassment. Level A harassment of this species is not anticipated or authorized by NMFS.

Bottlenose Dolphin

When this species is present in San Francisco Bay, it is 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; GGCR 2017; Perlman, 2017). The average reported group size for bottlenose dolphins is five. Reports show that a group normally comes into San Francisco Bay near Yerba Buena Island once per week for approximately 2-week stints and then leaves the Bay (NMFS, 2017b). Chevron assumed groups of five individuals may enter San Francisco Bay and the ensonified area three times during separate two-week spans. Therefore, groups of 5 animals would potentially be exposed at a rate of once per week over six weeks, resulting in up

to 30 Level B exposures. As such, NMFS proposes to authorize the take by Level B harassment of 30 bottlenose dolphins. Although a small Level A zone for mid-frequency cetaceans is estimated during impact driving, marine mammal monitoring of the shutdown would ensure that take by Level A harassment does not occur.

Gray Whale

Gray whales are the only whale species that travels far into San Francisco Bay with any regularity. They occasionally enter the Bay during their northward migration period, and are most often sighted in the Bay between February and May. Most venture only about 2 to 3 kilometers (about 1–2 miles) past the Golden Gate, but gray whales have occasionally been sighted as far north as San Pablo Bay. Pile driving is not anticipated to occur during the February through May timeframe and gray whales are not likely to be present at other times of year. In the very unlikely event that a gray whale or pair of gray whales makes its way close to the project area while pile driving activities are under way, Chevron has requested take by Level B harassment of up to two (2) gray whales per year. NMFS agrees and proposes the take of 2 gray whales by Level B harassment. No Level A take is proposed.

Tables 12 and 13 summarize the estimate of Level B and Level A harassment, respectively, for each species by pile driving activity for the 2018 construction season. For harbor seals, sea lions, harbor porpoise and elephant seals, the Level B harassment estimates are based on the number of individuals assumed to be exposed per day, the number of days of pile driving expected based on an average installation rate. The Level A harassment estimates are derived from the Level B harassment estimates by taking the Level B harassment and multiplying it by the fractional ratio of the area of the Level A zone to the Level B zone.

TABLE 12—TOTAL ESTIMATED TAKE BY LEVEL B HARASSMENT BY SPECIES AND PILE TYPE

Pile type	Pile driver type	Number of piles	Number of driving days	Species						
				Harbor seal	CA sea lion	Harbor porpoise *	Gray whale *	N. elephant seal	N. fur seal	Bottlenose dolphin
36-inch steel template pile**.	Vibratory	8	2	689.01	56.46	58.93	NA	2	NA	NA
Concrete pile removal	Vibratory	5	1	35.78	0.59	0.62	NA	1	NA	NA
24-inch concrete	Impact	8	8	100.23	0.06	0.06	NA	8	NA	NA
14-inch H pile installation***.	Impact/Vibratory	36	12	4,371.28	369.24	385.39	NA	12	NA	NA
Timber pile removal	Vibratory	53	5	178.89	2.95	3.08	NA	5	NA	NA
Total take by species (2018).				5,375	429	448	2	28	10	30

* Take is not calculated by activity type for these species, only a total is given.
** Only the installation of the template piles will occur in 2018. Take associated with their removal will be requested in a subsequent IHA.
*** These piles will be preferentially driven with a vibratory driver, which would have a larger Level B zone than installation with an impact driver. Thus, Level B take for this species is based on installation using vibratory driver, and not an impact driver.

TABLE 13—PROPOSED TAKE BY LEVEL A HARASSMENT

Pile type	Pile driver type	Number of driving days	Harbor seal	Harbor porpoise
36-inch steel template pile	Vibratory	2	0	0
Concrete pile removal	Vibratory	1	0	0
24-inch concrete	Impact	8	0	0
14-inch H pile installation	Impact/Vibratory	12	29	0.65
Timber pile removal	Vibratory	5	0	0
Total take			29	1

Table 14 provides a summary of proposed authorized Level A and Level B takes as well as the percentage of a stock or population proposed for take.

TABLE 14—PROPOSED AUTHORIZED TAKE AND PERCENTAGE OF STOCK OR POPULATION

Species	Stock	Proposed authorized Level A takes	Proposed authorized Level B takes	Percent population
Harbor seal	California	29	5,375	17.4
California sea lion	Eastern U.S		429	<0.01
Harbor porpoise	San Francisco–Russian River	2	448	4.5
Northern elephant seal	California Breeding		28	<0.01
Gray whale	Eastern North Pacific		2	<0.01
Northern fur seal	California		10	<0.01
Bottlenose Dolphin	California Coastal		30	6.6

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, and, in the case of a military readiness activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

Mitigation for Marine Mammals and Their Habitat

The following measures would apply to Chevron's mitigation requirements:

- *Seasonal Restriction*—To minimize impacts to listed fish species, pile-driving activities would occur between June 1 and November 30.
- *Daylight Construction Period*—Work would occur only during daylight hours (7:00 a.m. to 7:00 p.m.) when visual marine mammal monitoring can be conducted.
- *Establishment of Shutdown Zone*—For all pile driving/removal and drilling activities, Chevron will establish a shutdown zone. The purpose of a shutdown zone is generally to define an area within which shutdown of activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). A shutdown zone will be established which will include all or a portion of the area where underwater SPLs are expected to reach or exceed the cumulative SEL thresholds for Level A harassment as provided in Table 7. The shutdown isopleths for pinnipeds (harbor seals, California sea lion, Northern elephant seal, northern fur seal) and mid-frequency cetaceans (common dolphins) will be set at 35 meters; for high-frequency cetaceans (harbor porpoises) at 250 meters; and for low-frequency cetaceans (gray whales) at 350 meters.
- *10-Meter Shutdown Zone*—During the in-water operation of heavy machinery (*e.g.,* barge movements), a 10-m shutdown zone for all marine mammals will be implemented. If a marine mammal comes within 10 m, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions.
- *Establishment of Monitoring Zones for Level A and Level B*—Chevron will establish and monitor Level A harassment zones during impact driving for harbor seal extending to 183 meters and harbor seals and extending to 408 m for harbor porpoises. These are areas beyond the shutdown zone in which animals could be exposed to sound levels that could result in PTS. Chevron will also establish and monitor Level B harassment zones which are areas where SPLs are equal to or exceed the 160 dB rms threshold for impact driving and the 120 dB rms threshold during vibratory driving and extraction. Monitoring zones provide utility for observing by establishing monitoring protocols for areas adjacent to the shutdown zones. Monitoring zones enable observers to be aware of and communicate the presence of marine mammals in the project area outside the shutdown zone and thus prepare for a potential cease of activity should the animal enter the shutdown zone. The Level B zones are depicted in Table 8. As shown, the largest Level B zone is equal to 192.31 km^2, making it impossible for Protected Species Observers (PSOs) to view the entire harassment area. Due to this, Level B exposures will be recorded and extrapolated based upon the number of observed take and the percentage of the Level B zone that was not visible.
- *Soft Start*—The use of a soft-start procedure are 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 hammer operating at full capacity. Chevron shall use soft start techniques when impact pile driving. Soft start requires contractors to provide an initial set of strikes at reduced energy, followed by a thirty-second waiting period, then two subsequent reduced energy strike sets.
- *Pile Caps/Cushions*—Chevron will employ the use of pile caps or cushions as sound attenuation devices to reduce impacts from sound exposure during impact pile driving.
- *Pre-Activity Monitoring*—Pre-activity monitoring shall take place from 30 minutes prior to initiation of pile driving activity and post-activity monitoring shall continue through 30 minutes post-completion of pile driving activity. Pile driving may commence at the end of the 30-minute pre-activity monitoring period, provided observers have determined that the shutdown zone is clear of marine mammals, which includes delaying start of pile driving activities if a marine mammal is sighted in the zone, as described below.
- If a marine mammal approaches or enters the shutdown zone during activities or pre-activity monitoring, all pile driving activities at that location shall be halted or delayed, respectively. If pile driving is halted or delayed due to the presence of a marine mammal, the activity may not resume or commence until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone and 15 minutes have passed without re-detection of the animal. Pile driving activities include the time to install or remove 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.
- *Non-authorized Take Prohibited*—If a species for which authorization has not been granted or a species for which authorization has been granted but the authorized takes are met, is observed approaching or within the monitoring zone, pile driving and removal 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.

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.

Visual Monitoring

The following visual monitoring measures are proposed in the IHA.

- Biological monitoring would occur within one week before the Project's start date, to establish baseline observations.
- Monitoring distances, in accordance with the identified shutdown, Level A, and Level B zones, will be determined by using a range finder, scope, hand-held global positioning system (GPS) device or landmarks with known distances from the monitoring positions.
- Monitoring locations will be established at locations offering best views of the monitoring zone.
- Monitoring will be continuous unless the contractor takes a break longer than 2 hours from active pile and sheet pile driving, in which case, monitoring will be required 30 minutes prior to restarting pile installation.
- For in-water pile driving, under conditions of fog or poor visibility that might obscure the presence of a marine mammal within the shutdown zone, the pile in progress will be completed and then pile driving suspended until visibility conditions improve.
- At least two PSOs will be actively scanning the monitoring zone during all pile driving activities.
- Monitoring of pile driving shall be conducted by qualified PSOs (see below), who shall have no other assigned tasks during monitoring periods. Chevron shall adhere to the following conditions when selecting observers:

(1) Independent PSOs shall be used (*i.e.,* not construction personnel);

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

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

(4) Chevron shall submit PSO CVs for approval by NMFS.

- Chevron will ensure that observers have the following additional qualifications:

(1) Ability to conduct field observations and collect data according to assigned protocols.

(2) Experience or training in the field identification of marine mammals, including the identification of behaviors;

(3) Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;

(4) 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; and

(5) 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.

A draft marine mammal monitoring report would be submitted to NMFS within 90 days after the completion of pile driving and removal activities. It will include an overall description of work completed, a narrative regarding marine mammal sightings, and associated marine mammal observation data sheets. Specifically, the report must include:

- Date and time that monitored activity begins or ends;
- Construction activities occurring during each observation period;
- Deviation from initial proposal in pile numbers, pile types, average driving times, etc.
- Weather parameters (*e.g.,* percent cover, visibility);
- Water conditions (*e.g.,* sea state, tide state);
- For each marine mammal sighting the following must be recorded:

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

(2) Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity;

(3) Location and distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;

(4) Estimated amount of time that the animals remained in the Level B zone

- Description of implementation of mitigation measures within each monitoring period (*e.g.,* shutdown or delay);
- Other human activity in the area.
- A summary of the following must be included in the report.

(1) Total number of individuals of each species detected within the Level A and Level B Zones, and estimated take extrapolated across entire Level B zone; and

(2) Daily average number of individuals of each species (differentiated by month as appropriate) detected within the Level B Zone, and estimated take extrapolated across entire Level B zone.

If no comments are received from NMFS within 30 days, the draft final report will constitute the final report. If

comments are received, a final report addressing NMFS comments must be submitted within 30 days after receipt of comments.

In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by the IHA (if issued), such as an injury, serious injury or mortality, Chevron would immediately cease the specified activities and report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the West Coast Regional Stranding Coordinator. The report would include the following information:

- Description of the incident;
- Environmental conditions (*e.g.,* Beaufort sea state, visibility);
- Description of all marine mammal observations in the 24 hours preceding the incident;
- Species identification or description of the animal(s) involved;
- Fate of the animal(s); and
- Photographs or video footage of the animal(s) (if equipment is available).

Activities would not resume until NMFS is able to review the circumstances of the prohibited take. NMFS would work with Chevron to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. Chevron would not be able to resume their activities until notified by NMFS via letter, email, or telephone.

In the event that Chevron discovers an injured or dead marine mammal, and the lead PSO 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 as described in the next paragraph), Chevron would immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the West Coast Regional Stranding Coordinator. The report would include the same information identified in the paragraph above. Activities would be able to continue while NMFS reviews the circumstances of the incident. NMFS would work with Chevron to determine whether modifications in the activities are appropriate.

In the event that Chevron discovers an injured or dead marine mammal and the lead PSO 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), Chevron would report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the West Coast Regional Stranding Coordinator within 24 hours of the discovery. Chevron would provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network.

Hydroacoustic Monitoring

Sound Source Verification (SSV) testing of would be conducted under this IHA. The purpose of the proposed acoustic monitoring plan is to collect underwater sound-level information at both near and distant locations during vibratory pile extraction and installation and impact pile installation. The plan provides a protocol for hydroacoustic measurements during pile driving operations. Acoustic monitoring would be conducted on a minimum of two of each pile type. Since little data exist for source levels associated with installation of 24-inch square concrete piles (including data on single strike sound exposure level metrics) Chevron would conduct in-situ measurements during installation of eight piles. The SSV testing would be conducted by an acoustical firm with prior experience conducting SSV testing. Final results would be sent to NMFS. Findings may be used to establish Level A and Level B isopleths during impact and vibratory driving. Any alterations to the shutdown or harassment zones based on testing data must be approved by NMFS. The Hydroacoustic Monitoring Plan is contained on the following NMFS website*: https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities.*

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).

Pile driving and extraction associated with Chevron's WMEP project as outlined previously have the potential to injure, disturb or displace marine mammals. Specifically, the specified activities may result in Level B harassment (behavioral disturbance) for seven marine mammal species authorized for take from underwater sound generated during pile driving operations. Level A harassment in the form of PTS may also occur to limited numbers of two species. No marine mammal stocks for which incidental take authorization are listed as threatened or endangered under the ESA or determined to be strategic or depleted under the MMPA. No serious injuries or mortalities are anticipated to occur as a result of Chevron's pile driving activities.

A limited number of animals (29 harbor seals and 2 harbor porpoises) could experience Level A harassment in the form of PTS if they stay within the Level A harassment zone during impact driving of 24-inch steel H-piles. Installation of these piles would occur over eight days and impact driving will not be the primary method of installation. The piles will mainly be installed only through vibratory driving. Impact driving will only be used if the vibrated pile encounters an obstruction such as an old sunken pile. It is unlikely that this would occur for all four piles projected to be installed each driving day. An assumption of four piles per day was used to calculate Level A zone sizes. If four piles did require impact installation on a single day it is unlikely that the same individual marine mammal would be within the relatively small Level A zone during the installation of every pile. In most instances impact driving will not be required at all. Furthermore, the degree of injury is expected to be mild and is not likely to affect the reproduction or survival of the individual animals. It is expected that, if hearing impairments

occurs, most likely the affected animal would lose a few dB in its hearing sensitivity, which in most cases is not likely to affect its survival and recruitment.

The Level B takes that are anticipated and authorized are expected to be limited to short-term behavioral harassment. Marine mammals present near the action area and taken by Level B harassment would most likely show overt brief disturbance *(e.g.* startle reaction) and avoidance of the area from elevated noise level during pile driving. Repeated exposures of individuals to levels of sound that may cause Level B harassment are unlikely to significantly disrupt foraging behavior. Thus, even repeated Level B harassment of some small subset of the overall stock is unlikely to result in any significant realized decrease in fitness for the affected individuals, and thus would not result in any adverse impact to the stock as a whole.

The project is not expected to have significant adverse effects on affected marine mammal habitat. The activities may cause fish to leave the area temporarily. This could impact marine mammals' foraging opportunities in a limited portion of the foraging range; but, because of the short duration of the activities and the relatively small area of affected habitat, the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

The likelihood that marine mammals will be detected by trained observers is high under the environmental conditions described for the project. The employment of the soft-start mitigation measure would also allow marine mammals in or near the shutdown and Level A zone zones to move away from the impact driving sound source. Therefore, the mitigation and monitoring measures are expected to reduce the potential for injury and reduce the amount and intensity of behavioral harassment. Furthermore, the pile driving activities analyzed here are similar to, or less impactful than, numerous construction activities conducted in other similar locations which have taken place with no reported injuries or mortality to marine mammals, and no known long-term adverse consequences from behavioral harassment.

In summary and as described above, the following factors primarily support our preliminary 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:

- No mortality is anticipated or authorized;
- Anticipated incidences of Level A harassment would be in the form of a small degree of PTS to a limited number of animals;
- Anticipated incidents of Level B harassment consist of, at worst, temporary modifications in behavior;
- The relatively short and intermittent duration of in-water construction activities
- The small percentage of the stock that may be affected by project activities (< 17 percent for all stocks); and
- Efficacy of mitigation measures is expected to minimize the likelihood and severity of the level of harassment.

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 proposed monitoring and mitigation measures, NMFS preliminarily finds that the total marine mammal take from the proposed 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.

Table 14 depicts the number of animals that could be exposed to Level A and Level B harassment from work associated with Chevron's project. The analysis provided indicates that authorized takes account for no more than 17.4 percent of the populations of the stocks that could be affected. These are small numbers of marine mammals relative to the sizes of the affected stocks.

Based on 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 preliminarily 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)

Section 7(a)(2) of the Endangered Species Act of 1973 (ESA: 16 U.S.C. 1531 *et seq.*) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the issuance of IHAs, NMFS consults internally, in this case with the ESA Interagency Cooperation Division whenever we propose to authorize take for endangered or threatened species.

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 Chevron for conducting pile driving activities in San Francisco Bay from June 1, 2018 through May 31, 2019, 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, 2018 through May 31, 2019. This IHA is valid only for pile driving and extraction activities associated with Chevron's WMEP project.

2. General Conditions.

(a) A copy of this IHA must be in the possession of Chevron, its designees, and work crew personnel operating under the authority of this IHA.

(b) The species authorized for taking are of 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*), and

Northern elephant seal *Mirounga angustirostris).*

(c) The taking, by Level A and Level B harassment, is limited to the species listed in condition 2(b). See Table 14 for number of takes authorized.

(d) The take of any other species not listed in condition 2(b) of marine mammal is prohibited and may result in the modification, suspension, or revocation of this IHA.

(e) Chevron shall conduct briefings between construction supervisors and crews, marine mammal monitoring team, acoustical monitoring team prior to the start of all pile driving activities, and when new personnel join the work, in order to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures.

3. Mitigation Measures.

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

(a) Time Restrictions—For all in-water pile driving activities, Chevron shall operate only during daylight hours (7:00 a.m. to 7:00 p.m.)

(b) Seasonal Restriction—To minimize impacts to listed fish species, pile-driving activities shall occur between June 1 and November 30.

(c) Establishment of Shutdown Zone—For all pile driving/removal and drilling activities, Chevron shall establish a shutdown zone. The shutdown isopleths for pinnipeds (harbor seals, California sea lion, Northern elephant seal, northern fur seal) and mid-frequency cetaceans (common dolphins) shall be set at 35 meters; for high-frequency cetaceans (harbor porpoises) at 250 meters; and for low-frequency cetaceans (gray whales) at 350 meters.

(d) 10-Meter Shutdown Zone—During the in-water operation of heavy machinery (*e.g.,* barge movements), a 10-m shutdown zone for all marine mammals shall be implemented. If a marine mammal comes within 10 m, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions.

(e) Establishment of Monitoring Zones for Level A and Level B—Chevron shall establish and monitor Level A harassment zones during impact driving for harbor seal extending to 183 meters and harbor porpoise extending to 408 meters. Chevron shall also establish and monitor Level B harassment zones as depicted in Table 8.

(f) Soft Start—Chevron shall use soft start techniques when impact pile driving. Soft start requires contractors to provide an initial set of strikes at reduced energy, followed by a thirty-second waiting period, then two subsequent reduced energy strike sets. Soft start shall be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of thirty minutes or longer.

(g) Pre-Activity Monitoring—Pre-activity monitoring shall take place from 30 minutes prior to initiation of pile driving activity and post-activity monitoring shall continue through 30 minutes post-completion of pile driving activity. Pile driving may commence at the end of the 30-minute pre-activity monitoring period, provided observers have determined that the shutdown zone is clear of marine mammals, which includes delaying start of pile driving activities if a marine mammal is sighted in the zone, as described below.

(h) If a marine mammal approaches or enters the shutdown zone during activities or pre-activity monitoring, all pile driving activities at that location shall be halted or delayed, respectively. If pile driving is halted or delayed due to the presence of a marine mammal, the activity may not resume or commence until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone and 15 minutes have passed without re-detection of the animal. Pile driving activities include the time to install or remove 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.

(i) Non-authorized Take Prohibited—If a species for which authorization has not been granted or a species for which authorization has been granted but the authorized takes are met, is observed approaching or within the monitoring zone, pile driving and removal 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.

4. Monitoring.

The holder of this Authorization is required to conduct visual marine mammal monitoring during pile driving activities:

(a) Visual Marine Mammal Observation—The following visual monitoring measures shall be implemented.

(i) Biological monitoring shall occur within one (1) week before the project's start date.

(ii) Monitoring distances, in accordance with the identified shutdown zones, Level A and Level B zones, shall be determined by using a range finder, scope, hand-held global positioning system (GPS) device or landmarks with known distances from the monitoring positions.

(iii) Monitoring locations shall be established at locations offering best views of the monitoring zone.

(iv) At least two PSOs shall be actively scanning the monitoring zone during all pile driving activities.

(v) Monitoring shall be continuous unless the contractor takes a break longer than 2 hours from active pile and sheet pile driving, in which case, monitoring shall be required 30 minutes prior to restarting pile installation.

(vi) For in-water pile driving, under conditions of fog or poor visibility that might obscure the presence of a marine mammal within the shutdown zone or Level A zone, the pile in progress shall be completed and then pile driving suspended until visibility conditions improve.

(vii) Monitoring of pile driving shall be conducted by qualified PSOs, who shall have no other assigned tasks during monitoring periods. Chevron shall adhere to the following conditions when selecting observers:

(1) Independent PSOs shall be used (*i.e.,* not construction personnel);

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

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

(4) Chevron shall submit PSO CVs for approval by NMFS.

(viii) Chevron shall ensure that observers have the following additional qualifications:

(1) Ability to conduct field observations and collect data according to assigned protocols;

(2) Experience or training in the field identification of marine mammals, including the identification of behaviors;

(3) Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;

(4) 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; and

(5) 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.

(b) Hydroacoustic Monitoring.

(i) Sound Source Verification (SSV) testing shall be conducted as stipulated in the Hydroacoustic Monitoring Plan.

(ii) Acoustic monitoring shall be conducted on a minimum of two of each pile type, except for 24-in square concrete piles shall require monitoring of 8 piles.

(iii) Testing shall be conducted by an acoustical firm with prior experience conducting SSV testing.

(iv) Final results shall be sent to NMFS and may be used to establish shutdown and monitoring isopleths.

(v) Any alterations to the shutdown or monitoring zones based on testing data must be approved by NMFS.

5. Reporting.

(a) A draft marine mammal monitoring report shall be submitted to NMFS within 90 days after the completion of pile driving and removal activities or a minimum of 60 days prior to any subsequent IHAs. A final report shall be prepared and submitted to the NMFS within 30 days following receipt of comments on the draft report from the NMFS.

(b) The report shall include an overall description of work completed, a narrative regarding marine mammal sightings, and associated marine mammal observation data sheets. Specifically, the report must include:

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

(ii) Construction activities occurring during each observation period;

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

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

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

(vi) For each marine mammal sighting the following must be recorded:

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

(2) Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity;

(3) Location and distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;

(4) Estimated amount of time that the animals remained in the Level A and B zones

(vii) Description of implementation of mitigation measures within each monitoring period (*e.g.,* shutdown or delay);

(viii) Other human activity in the area.

(ix) The report must contain a summary of the following:

(1) Total number of individuals of each species detected within the Level A and Level B Zones,

(2) Estimated take extrapolated across entire Level B zone; and

(3) Daily average number of individuals of each species (differentiated by month as appropriate) detected within the Level B Zone, and estimated take extrapolated across entire Level B zone.

(x) If no comments are received from NMFS within 30 days, the draft final report shall constitute the final report. If comments are received, a final report addressing NMFS comments must be submitted within 30 days after receipt of comments.

(c) In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by the IHA (if issued), such as an injury, serious injury or mortality, Chevron would immediately cease the specified activities and report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the West Coast Regional Stranding Coordinator. The report must include the following:

(i) Description of the incident;

(ii) Environmental conditions (*e.g.,* Beaufort sea state, visibility);

(iii) Description of all marine mammal observations in the 24 hours preceding the incident;

(iv) Species identification or description of the animal(s) involved;

(v) Fate of the animal(s); and

(vi) Photographs or video footage of the animal(s) (if equipment is available).

(vii) Activities would not resume until NMFS is able to review the circumstances of the prohibited take. NMFS would work with Chevron to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. Chevron would not be able to resume their activities until notified by NMFS via letter, email, or telephone.

(b) In the event that Chevron discovers an injured or dead marine mammal, and the lead PSO 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 as described in the next paragraph), Chevron would immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the West Coast Regional Stranding Coordinator. The report would include the same information identified in section above. Activities would be able to continue while NMFS reviews the circumstances of the incident. NMFS would work with Chevron to determine whether modifications in the activities are appropriate.

(c) In the event that Chevron discovers an injured or dead marine mammal and the lead PSO 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), Chevron would report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the West Coast Regional Stranding Coordinator within 24 hours of the discovery. Chevron would provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network.

6. 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 draft authorization, and any other aspect of this Notice of Proposed IHA for the proposed Chevron WMEP project. 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 one-year renewal 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 renewal would allow 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: April 24, 2018.

Donna S. Wieting,

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

[FR Doc. 2018–09033 Filed 4–27–18; 8:45 am]

BILLING CODE 3510–22–P

COMMODITY FUTURES TRADING COMMISSION

Agency Information Collection Activities Under OMB Review

AGENCY: Commodity Futures Trading Commission.

ACTION: Notice.

SUMMARY: In compliance with the Paperwork Reduction Act of 1995 (PRA), this notice announces that the Information Collection Request (ICR) abstracted below has been forwarded to the Office of Management and Budget (OMB) for review and comment. The ICR describes the nature of the information collection and its expected costs and burden.

DATES: Comments must be submitted on or before May 30, 2018.

ADDRESSES: Comments regarding the burden estimate or any other aspect of the information collection, including suggestions for reducing the burden, may be submitted directly to the Office of Information and Regulatory Affairs (OIRA) in OMB within 30 days of this notice's publication by either of the following methods. Please identify the comments by ''OMB Control No. 3038–0095.''

• *By email addressed to: OIRAsubmissions@omb.eop.gov* or

• *By mail addressed to:* The Office of Information and Regulatory Affairs, Office of Management and Budget, Attention Desk Officer for the Commodity Futures Trading Commission, 725 17th Street NW, Washington, DC 20503.

A copy of all comments submitted to OIRA should be sent to the Commodity Futures Trading Commission (the ''Commission'') by either of the following methods. The copies should refer to ''OMB Control No. 3038–0095.''

• *By mail addressed to:* Christopher Kirkpatrick, Secretary of the Commission, Commodity Futures Trading Commission, Three Lafayette Centre, 1155 21st Street NW, Washington, DC 20581;

• By Hand Delivery/Courier to the same address; or

• Through the Commission's website at *http://comments.cftc.gov.* Please follow the instructions for submitting comments through the website.

A copy of the supporting statement for the collection of information discussed herein may be obtained by visiting *http://RegInfo.gov.*

All comments must be submitted in English, or if not, accompanied by an English translation. Comments will be posted as received to *http://www.cftc.gov.* You should submit only information that you wish to make available publicly. If you wish the Commission to consider information that you believe is exempt from disclosure under the Freedom of Information Act, a petition for confidential treatment of the exempt information may be submitted according to the procedures established in § 145.9 of the Commission's regulations.[1] The Commission reserves the right, but shall have no obligation, to review, pre-screen, filter, redact, refuse or remove any or all of your submission from *http://www.cftc.gov* that it may deem to be inappropriate for publication, such as obscene language. All submissions that have been redacted or removed that contain comments on the merits of the ICR will be retained in the public comment file and will be considered as required under the Administrative Procedure Act and other applicable laws, and may be accessible under the Freedom of Information Act.

FOR FURTHER INFORMATION CONTACT: Owen J. Kopon, Special Counsel, Division of Market Oversight, Commodity Futures Trading Commission, (202) 418–5360; email: *okopon@cftc.gov,* and refer to OMB Control No. 3038–0095.

SUPPLEMENTARY INFORMATION:

Title: Large Trader Reporting for Physical Commodity Swaps (OMB Control No. 3038–0095). This is a request for extension and revision of a currently approved information collection.

Abstract: Part 20 of the Commission's regulations (''Reporting Rules'') requires clearing organizations and any persons that are ''reporting entities'' to file swaps position data with the Commission. The Reporting Rules collect clearing member reports from clearing organizations. The Reporting Rules also require position reports from reporting entities for principal and counterparty positions in cleared and uncleared physical commodity swaps. Reporting entities are those persons that are either ''clearing members'' or ''swap dealers'' that are otherwise not clearing members. For purposes of part 20, reporting parties are required to submit data on positions on a futures equivalent basis so as to allow the Commission to assess a trader's market impact across differently structured but linked derivatives instruments and markets. This renewal updates the total requested burden based on available reported data.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. On February 9, 2018, the Commission published in the **Federal Register** notice of the proposed extension of this information collection and provided 60 days for public comment on the proposed extension, 83 FR 5761 (''60-Day Notice''). The Commission did not receive any comments on the 60-Day Notice.

Burden Statement: The respondent burden for this collection is estimated to be as follows: [2]

Estimated Number of Respondents: 4,824.

Estimated Average Annual Burden Hours per Respondent: 1.57.

Estimated Total Annual Number of Responses: 38,408.

Estimated Total Annual Burden Hours: 60,382.

Type of Respondents: Respondents may include clearing organizations, persons that are clearing members or swap dealers that are reporting entities, and large swap counterparties.

(Authority: 44 U.S.C. 3501 *et seq.*)

[1] 17 CFR 145.9.

[2] The burden estimates that appeared in the 60-day Notice contained a calculation error that resulted in double counting burden hours, 83 FR 5761 (Feb. 9, 2018). This calculation error has been corrected and the following adjustments to the previous burden estimates have been made, as indicated above: The Estimated Average Annual Burden Hours per Respondent have been corrected from 1.55 to 1.57; the Estimated Total Annual Number of Responses has been adjusted from 56,088 to 38,408; and the Estimated Total Annual Burden Hours have been adjusted from 86,902 to 60,382.