Notification to Importers

This notice serves as a final reminder to importers of their responsibility under 19 CFR 351.402(f)(2) to file a certificate regarding the reimbursement of antidumping duties prior to liquidation of the relevant entries during this review period. Failure to comply with this requirement could result in Commerce's presumption that reimbursement of antidumping duties occurred and the subsequent assessment of doubled antidumping duties.

Notification Regarding Administrative Protective Order

This notice also serves as a reminder to parties subject to administrative protective order (APO) of their responsibility concerning the disposition of proprietary information disclosed under APO in accordance with 19 CFR 351.305(a)(3). Timely written notification of the return or destruction of APO materials or conversion to judicial protective order is hereby requested. Failure to comply with the regulations and the terms of an APO is a sanctionable violation.

This notice is issued and published in accordance with sections 751(a)(1) and 777(i)(1) of the Act and 19 CFR 351.213(d)(4).

Dated: April 25, 2018.

James Maeder,

Associate Deputy Assistant Secretary for Antidumping and Countervailing Duty Operations, performing the duties of Deputy Assistant Secretary for Antidumping and Countervailing Duty Operations.

[FR Doc. 2018–09047 Filed 4–27–18; 8:45 am]

BILLING CODE 3510–DS–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XG107

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Parallel Thimble Shoal Tunnel Project in Virginia Beach, Virginia

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 the Chesapeake Tunnel Joint Venture (CTJV) for authorization to take marine mammals incidental to the Parallel Thimble Shoal Tunnel Project (PTST) in Virginia Beach, Virginia. 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 United States. 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 January 11, 2018, NMFS received a request from the CTJV for an IHA to take marine mammals incidental to pile driving at the Chesapeake Bay Bridge and Tunnel (CBBT) near Virginia Beach, Virginia. CTJV's request is for take of small numbers of harbor seal (*Phoca vitulina*), gray seal (*Halichoerus grypus*), bottlenose dolphin (*Tursiops* spp.), harbor porpoise (*Phocoena phocoena),* and humpback whale (*Megaptera novaeangliae*) by Level A and Level B harassment. Neither the CTJV nor NMFS expect serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

Description of Proposed Activity

Overview

The PTST project consists of the construction of a two-lane parallel tunnel to the west of the existing Thimble Shoal Tunnel, connecting Portal Island Nos. 1 and 2 (Figure 1 in application). Upon completion, the new tunnel will carry two lanes of southbound traffic and the existing tunnel will remain in operation and carry two lanes of northbound traffic. The PTST project will address existing constraints to regional mobility based on current traffic volume along the Chesapeake Bay Bridge-Tunnel (CBBT) facility; improve safety by minimizing one lane, two-way traffic in the tunnel; improve the ability to conduct necessary maintenance with minimal impact to traffic flow; and ensure a reliable southwest hurricane evacuation route for residents of the eastern shore and/or a northern evacuation route for residents of the eastern shore, Norfolk, and Virginia Beach. The CBBT is a 23 mile fixed link crossing the mouth of the Chesapeake Bay which connects Northampton County on the Delmarva Peninsula with Virginia Beach, which is part of the Hampton Roads metropolitan area.

The new parallel tunnel will be bored under the Thimble Shoal Channel. The 6,525 linear feet (ft) of new tunnel will be constructed with a top of tunnel depth/elevation of 100 ft below Mean Low Water (MLW) within the width of the 1,000-ft-wide navigation channel. Impact pile driving will be used to install steel piles and vibratory pile driving will be utilized to install sheet piles. Sound produced during pile driving activities may result in behavioral harassment or auditory injury to local marine mammals. In-water construction will occur during spring and summer of 2018. This proposed IHA would cover one year of a larger project for which will run through 2022. The larger project, which does not employ pile driving and does not require an IHA, involves tunnel excavation with a tunnel boring machine and construction of a roadway within the tunnel.

Dates and Duration

In-water construction is planned to begin on June 1, 2018 and run through March 31, 2019. Pile driving, which may be concurrent at times, could occur up to 8 hours per day for up to 202 days.

Specific Geographic Region

The PTST project is located between Portal Island Nos. 1 and 2 of the CBBT, and will be bored underneath the Thimble Shoal Channel in the Chesapeake Bay. Water depths within the PTST construction area range from 0 to 60 ft below Mean Lower Low Water (MLLW). The Thimble Shoal Channel is 1,000 ft wide, is authorized to a depth of 55 ft below MLLW, and is maintained at a depth of 50 ft MLLW.

Detailed Description of Specific Activity

Construction of the tunnel structure will begin on Portal Island No. 1 and move from south to north to Portal Island No. 2. It is anticipated that this project will be constructed without any or minimal effect on the existing tunnel and traffic operations. The only short-term possibility for traffic impact could occur when connecting the existing roadway to the new roadway. The Tunnel Boring Machine (TBM) components will be barged and trucked to Portal Island No. 1. The TBM will be assembled within an entry/launch portal that will be constructed on Portal Island No. 1. The machine will then both excavate material and construct the tunnel as it progresses from Portal Island No. 1 to Portal Island No. 2. Material excavated from within the tunnel will be transported via a conveyor belt system back to Portal Island No 1. Approximately 350,000 cubic yards (cy) (*in situ* volume) of material will be excavated by the TBM and 524,000 cy (bulked volume) will be conveyed to Portal Island No. 1. This material will be transported offsite using a combination of trucks and barges and will be disposed at an approved off-site, upland facility in accordance with the Dredged Material Management Plan.

Precast concrete tunnel segments will be transported to the TBM for installation. The TBM will assemble the tunnel segments in-place as the tunnel is bored. After the TBM reaches Portal Island No. 2, it will be disassembled and the components will be removed via an exit/receiving portal on Portal Island No. 2. After the tunnel structure is completed, final upland work for the PTST project will include installation of the final roadway, lighting, finishes, mechanical systems, and other required internal systems for tunnel use and function. In addition, the existing fishing pier will be repaired and refurbished.

In-Water Construction Activities. In-water activities for the tunnel construction will be limited to eight primary actions:

(1) Construction and use of a temporary dock, an integrated temporary conveyor dock, and mooring facilities;

(2) Construction of temporary roadway trestles requiring a limited number of in-water piles and partially extending over water to facilitate safe construction vehicle movements on each portal island. For Portal Island No. 1, the temporary docking will integrate the roadway trestle in the same structure;

(3) Construction of temporary work trestles approximately 850 ft long and 35 ft wide each, and offset west of the tunnel alignment to facilitate construction of the berms;

(4) Temporary subaqueous stockpiling of existing armor stones for re-use;

(5) Construction of two permanent engineered berms (one extending channelward from each of the two portal islands) including installation of steel sheet pile to provide settlement mitigation between the existing tunnel and the new tunnel, handling of existing stone, adding new stone, and limited mechanical dredging at Portal Island No. 1;

(6) Underground (below the sediment-water interface) tunnel boring;

(7) Repair/rehabilitation to the existing fishing pier substructure and trestle substructure (only if deemed necessary based on inspection); and

(8) Construction and use of outfalls on the east side of Portal Island No. 1 to allow for permitted process water discharges from a project-specific wastewater treatment facility, and periodic, intermittent warm water discharges of non-contact cooling water from an on-site cooling system.

Up to 132 hollow steel piles measuring 36 inches in diameter will be installed to support the integrated temporary dock/barge unloading/

conveyor facility and temporary conveyor dock at Portal Island No. 1. Of these, 82 will be placed in-water and 50 will be placed upland (above the mean high water (MHW) line). Up to 30 hollow steel piles (36-inch diameter) will be installed to provide mooring facilities along each portal island (six dolphin moorings comprised of five piles each).

Up to 160 hollow steel piles (36-inch in diameter, below MHW) will be installed to support temporary work platforms (trestles) offset to the west of each of the two engineered berms. These trestles will extend 841 ft and 809 ft channelward from Portal Island Nos. 1 and 2, respectively. Up to 12 round piles will be installed on the island above MHW to support a temporary roadway trestle at Portal Island No. 2. Installation for the temporary docks and mooring dolphins will occur over approximately 2 months; commencing in June 2018 as shown in Table 1. Installation of the temporary offset construction trestles will occur over approximately five months. In-water pile driving activities will also include installation of sheet pile for settlement mitigation and as an in-water containment system to facilitate construction of the engineered berms adjacent to Portal Island Nos. 1 and 2. A total of 1,540 linear ft of sheet pile (or 830 individual sheets each 27.56 inches in length) will be installed over approximately eight months.

TABLE 1—ANTICIPATED PILE INSTALLATION SCHEDULE

Pile location	Pile function	Pile type	Number of piles (upland/in-water)	Anticipated installation date
Portal Island Nos. 1 and 2	Mooring dolphins (in-water)	36-inch diameter hollow steel.	30	1 June to 30 June 2018.
West of Portal Island No. 1	Berm construction trestle (in-water).	36-inch diameter hollow steel.	80	1 July 2018 through 1 January 2019.
West of Portal Island No. 2	Berm construction trestle (in-water).	36-inch diameter hollow steel.	80	1 July 2018 through 1 January 2019.
Portal Island No. 1	Temporary docks (upland)	36-inch diameter hollow steel	50	1 May 2018 through 30 June 2018.
Portal Island No. 1	Temporary docks (in- water)	36-inch diameter hollow steel.	82	1 July 2018 to 30 August 2018.
Portal Island No. 2 (above MHW).	Temporary roadway trestle (upland).	36-inch diameter hollow steel.	12	1 May to 31 May 2018.
Portal Island No. 1 (above MHW).	Excavated TBM material containment holding (muck) bin (upland).	28 and 18-inch steel sheet	1,110	1 May 2018 to 30 September 2018.
Portal Island Nos. 1 and 2 (above and below MHW).	Settlement mitigation and flowable fill containment.	28-inch steel sheet	2,554	1 August 2018 to 30 March 2019.
Portal Island Nos. 1 and 2 (above MHW).	Portal excavation	Steel sheet	1,401	1 June 2018 to 30 September 2018, 1 January to 30 March 2019.
Portal Island Nos. 1 and 2 (above MHW).	Excavation Support	Steel sheet	240	1 April 2018 to 30 August 2019 to 1 January 2019 to 30 March 2019.
Total (above and below water).			5,305 Sheet Piles; 334 Round Piles.	

Prior to initiation of the boring of the tunnel, construction of two engineered in-water berms will be required to provide structural support to the launch/receiving sections of the tunnel that are in closest proximity to the portal islands. Each engineered berm (at its maximum design configuration) will extend from the portal island channelward and will be approximately 1,400 ft long by 260 ft wide (at its widest point). Construction of the engineered berms will require installation of temporary trestles offset to the west of each berm alignment to serve as work platforms. The trestles will be supported by 36-inch diameter round steel piles driven by an impact hammer (with an encased bubble curtain). Construction will also require installation of parallel rows of sheet pile (using a vibratory hammer) approximately 530 linear ft in length by 60 ft in width channelward from MHW along the berm alignment at both Portal Islands.

Mechanical dredging to remove unsuitable berm foundation material (Portal Island No. 1 only) and disposal of dredged material via bottom-dump, or upland placement at an approved site. Note that NMFS does not consider underwater noise levels associated with dredging to occur at a level that could result in harassment of marine mammals. Therefore, dredging operations are not considered further in this analysis.

A number of additional upland construction activities are planned on the Portal Islands as part of the PTST project. Since these activities will not occur in water, they are not included as part of this analysis and are described in detail in section 1.3 in the application.

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 (*www.nmfs.noaa.gov/pr/species/mammals/*).

Table 2 lists all species with expected potential for occurrence in near the CBBT 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 United States waters. All managed stocks in this region are assessed in NMFS's United States Atlantic and Gulf of Mexico Marine Mammal Stock Assessments (Hayes *et al.,* 2017a,b). All values presented in Table 2 are the most recent available at the time of publication and are available in the 2016 Stock Assessment Report (Hayes *et al.,* 2017a) and draft 2017 stock assessment report (Hayes *et al.,* 2017b) (available online at: *www.nmfs.noaa.gov/pr/sars/regiont.htm*).

TABLE 2—MARINE MAMMAL SPECIES LIKELY TO OCCUR NEAR 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 Balaenidae:						
North Atlantic Right whale	*Eubalaena glacialis*	Western North Atlantic (WNA)	E/D; Y	458 (0; 455; 2017)	1.4	36
Family Balaenopteridae (rorquals):						
Humpback whale	*Megaptera novaeangliae*	Gulf of Maine	-; N	335 (.42; 239; 2012)	3.7	8.5
Fin whale	*Balaenoptera physalus*	WNA	E/D; Y	1,618 (0.33; 1,234; 2011)	2.5	2.65
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae:						
Bottlenose dolphin	*Tursiops spp.*	WNA Coastal, Northern Migratory.	D; Y	11,548 (0.36; 8,620; 2010–11).	86	1.0–7.5
		WNA Coastal, Southern Migratory.	D; Y	9,173 (0.46; 6,326; 2010–11).	63	0–12
		Northern North Carolina Estuarine System.	D; S	823 (0.06; 782; 2013)	7.8	1.0–16.7
Family Phocoenidae (porpoises):						
Harbor porpoise	*Phocoena phocoena*	Gulf of Maine/Bay of Fundy	-; N	79,833 (0.32; 61,415; 2011).	706	307 (0.16)
Order Carnivora—Superfamily Pinnipedia						
Family Phocidae (earless seals):						
Harbor seal	*Phoca vitulina*	WNA	-; N	75,834 (0.1; 66,884, 2012).	2,006	368
Gray seal	*Halichoerus grypus*	WNA	-; N	27,131 (.1, 25,908, 2016)	1,554	5,207

[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.

[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 2. However, the occurrence of endangered North Atlantic right whales and endangered fin whales is such that take is not expected to occur, and they are not discussed further beyond the explanation provided here. Between 1998 and 2013, there were no reports of North Atlantic right whale strandings within the Chesapeake Bay and only four reported standings along the coast of Virginia. During this same period, only six fin whale strandings were recorded within the Chesapeake Bay (Barco and Swingle 2014). In 2016, there were no reports of fin whale strandings (Barco *et al.,* 2017). Due to the low occurrence of North Atlantic right whales and fin whales, NMFS is not proposing take of these species.

Humpback Whale

Humpback whales inhabit all major ocean basins from the equator to subpolar latitudes. They generally follow a predictable migratory pattern in both hemispheres, feeding during the summer in the higher latitudes (40 to 70 degrees latitude) and migrating to lower latitudes (10 to 30 degrees latitude) where calving and breeding take place in the winter (Perry *et al.,* 1999, NOAA

Fisheries 2006a). During the spring, summer, and fall, humpback whales in the North Atlantic Ocean feed over a range that includes the eastern coast of the United States, the Gulf of St. Lawrence, Newfoundland/Labrador, and western Greenland.

Humpback whales are the whale most likely to occur in the project area and could be found there at any time of the year. NOAA reported that between 2009–2013, three humpback whales were stranded in Virginia in the lower Bay (one off of Northampton County, one near the York River, and one off of Ft. Story), and two were stranded in Maryland near Ocean City (NOAA Fisheries 2015b). All of the whales stranded in Virginia and Maryland had signs of human-caused injury. NOAA's database of mortality and serious injury indicates no human caused serious injuries for humpback whales in the Chesapeake Bay proper between 1999 and 2003. The only reported mortality of a humpback whale during the 1999–2003 time period was at the mouth of the Chesapeake Bay in Virginia as the result of a ship strike. Three other humpback whale mortalities related to ship strikes or entanglement in fishing gear in Virginia waters were reported during the study period. One serious injury to a humpback whale as a result of entanglement in fishing gear occurred near Ocean City, Maryland (Cole *et al.,* 2005).

There have been 33 humpback whale strandings recorded in Virginia between 1988 and 2013; 11 had signs of entanglement and 9 had injuries from vessel strikes. Most of these strandings were reported from ocean facing beaches, but 11 were also within the Chesapeake Bay (Barco and Swingle 2014). Strandings occurred in all seasons, but were most common in the spring. In the past 5 years of reported data (2011–2015), there have been five humpback whale strandings in Virginia (Swingle *et al.,* 2012, Swingle *et al.,* 2013, Swingle *et al.,* 2014, Swingle *et al.,* 2015, Swingle *et al.,* 2016). Since the beginning of 2017, five dead humpback whales have been observed in Virginia (Funk 2017). Ship strikes have been attributed as the likely cause of death in these instances. Note that in 2016, NMFS declared that an Unusual Mortality Event (UME) for humpback whales strandings along the Atlantic Coast from Maine through North Carolina. This means that elevated whale mortalities have occurred in the area. Since January 2016 through March 2018, thirteen strandings have occurred in Virginia and two have occurred in Maryland.

In winter, whales from the six feeding areas mate and calve primarily in the West Indies where spatial and genetic mixing among these groups occur (Waring *et al.,* 2000). Various papers (Clapham and Mayo 1990, Clapham *et al.,* 1992, Barlow and Clapham 1997, Clapham *et al.,* 1999) summarized information gathered from a catalogue of photographs of 643 individuals from the western North Atlantic population of humpback whales (also referred to as the Gulf of Maine stock). These photographs identified reproductively mature western North Atlantic humpbacks wintering in tropical breeding grounds in the Antilles, primarily on Silver and Navidad Banks, north of the Dominican Republic. The primary winter range also includes the Virgin Islands and Puerto Rico (NOAA Fisheries 1991). Not all whales migrate to the West Indies every year and some are found in the mid- and high-latitude regions during the winter months.

Humpback whales use the mid-Atlantic as a migratory pathway to and from the calving/mating grounds, but it may also be an important winter feeding area for juveniles. Since 1989, observations of juvenile humpbacks in the mid-Atlantic have been increasing during the winter months, peaking from January through March (Swingle *et al.,* 1993). Biologists theorize that non-reproductive animals may be establishing a winter feeding range in the mid-Atlantic since they are not participating in reproductive behavior in the Caribbean. Swingle *et al.* (1993) identified a shift in distribution of juvenile humpback whales in the nearshore waters of Virginia, primarily in winter months. Identified whales using the mid-Atlantic area were found to be residents of the Gulf of Maine and Atlantic Canada (Gulf of St. Lawrence and Newfoundland) feeding groups; suggesting a mixing of different feeding populations in the Mid-Atlantic region. Strandings of humpback whales have increased between New Jersey and Florida since 1985, consistent with the increase in mid-Atlantic whale sightings. Strandings were most frequent during September through April in North Carolina and Virginia waters, and were composed primarily of juvenile humpback whales of no more than 11 meters in length (Wiley *et al.,* 1995).

Bottlenose Dolphin

Bottlenose dolphins occur in temperate and tropical oceans throughout the world, ranging in latitudes from 45° N to 45° S (Blaylock 1985). In the western Atlantic Ocean there are two distinct morphotypes of bottlenose dolphins, an offshore type that occurs along the edge of the continental shelf as well as an inshore type. The inshore morphotype can be found along the entire United States coast from New York to the Gulf of Mexico, and typically occurs in waters less than 20 meters deep (NOAA Fisheries 2016a). There is evidence that the inshore bottlenose dolphins may be made up of seven different stock which may be either year-round residents or migratory. Bottlenose dolphins found in Virginia are representative primarily of either the northern migratory coastal stock or southern migratory coastal stock. The northern migratory stock spends the winter along the coast of North Carolina and migrates as far north as Long Island, New York in the summer. They are rarely found north of North Carolina in the winter (NOAA Fisheries 2016a). During October–December, the southern migratory stock occupies waters of southern North Carolina. During January–March, the southern migratory stock appears to move as far south as northern Florida. During April–June, the stock moves north to North Carolina while during July–August, the stock is presumed to occupy coastal waters north of Cape Lookout, North Carolina, to the eastern shore of Virginia. It is possible that these animals also occur inside the Chesapeake Bay and in nearshore coastal waters. There is also evidence that limited numbers of the Northern North Carolina Estuarine System Stock (NNCES) may occur in the Chesapeake Bay in the July–August timeframe.

Bottlenose dolphins are the most abundant marine mammal along the Virginia coast and within the Chesapeake Bay. They are seen annually in Virginia from May through October with around 65 strandings occurring each year (Barco and Swingle 2014). During 2016, 68 bottlenose dolphin strandings were recorded in Virginia (Barco *et al.,* 2017). Stranded bottlenose dolphins have been recorded as far north as the Potomac River in the Chesapeake Bay (Blaylock 1985). Both the northern and southern migratory coastal stocks are listed as depleted under the MMPA.

The inshore variety of bottlenose dolphins often travel in small groups of 2 to 15 individuals. These groups and will travel into bays, estuaries, and rivers to feed, utilizing echolocation to find a variety of prey, including fish, squid, and benthic invertebrates (NOAA Fisheries 2017b).

Harbor Porpoise

The harbor porpoise is typically found in colder waters in the northern hemisphere. In the western North Atlantic Ocean, harbor porpoises range from Greenland to as far south as North Carolina (Barco and Swingle 2014). They are commonly found in bays, estuaries, and harbors less than 200 meters deep (NOAA Fisheries 2017c). Harbor porpoises in the United States are made up of the Gulf of Main/Bay of Fundy stock. Gulf of Main/Bay of Fundy stock are concentrated in the Gulf of Maine in the summer, but are widely dispersed from Maine to New Jersey in the winter. South of New Jersey, harbor porpoises occur at lower densities. Migrations to and from the Gulf of Maine do not follow a defined route (NOAA Fisheries 2016c).

Harbor porpoise occur seasonally in the winter and spring in small numbers in mid-Atlantic waters. Strandings occur primarily on ocean facing beaches, but they occasionally travel into the Chesapeake Bay to forage and could occur in the project area (Barco and Swingle 2014). Since 1999, stranding incidents have ranged widely from a high of 40 in 1999 to 2 in 2011, 2012, and 2016 (Barco *et al.,* 2017.

Harbor Seal

Harbor seals occur in arctic and temperate coastal waters throughout the northern hemisphere, including on both the east and west coasts of the United States. On the east coast, harbor seals can be found from the Canadian Arctic down to Georgia (Blaylock 1985). Harbor seals occur year-round in Canada and Maine and seasonally (September–May) from southern New England to New Jersey (NOAA Fisheries 2016d). The range of harbor seals appears to be shifting as they are regularly reported further south than they were historically. In recent years, they have established haul out sites in the Chesapeake Bay including on the portal islands of the CBBT (NOAA Fisheries 2016d, Rees *et al.,* 2016).

Harbor seals are the most common seal in Virginia (Barco and Swingle 2014). They can be seen resting on the rocks around the portal islands of the CBBT from December through April. Seal observation surveys conducted at the CBBT recorded 112 harbor seals in the 2014/2015 season and 184 harbor seals during the 2015/2016 season (Rees *et al.,* 2016).

The harbor seal is a medium-sized seal, reaching about 2 meters in length. They spend a fair amount of time hauled out on land, often in large groups (Rees *et al.,* 2016). Haul out sites—which may be rocks, beaches, or ice—provide the opportunity for rest, thermal regulation, social interaction, parturition, and predator avoidance (NOAA Fisheries 2017e).

Gray Seal

Gray seals occur on both coasts of the Northern Atlantic Ocean and are divided into three major populations (NOAA Fisheries 2016b). The western north Atlantic stock occurs in eastern Canada and the northeastern United States, occasionally as far south as North Carolina. Gray seals inhabit rocky coasts and islands, sandbars, ice shelves and icebergs (NOAA Fisheries 2016b). In the United States, gray seals congregate in the summer to give birth at four established colonies in Massachusetts and Maine (NOAA Fisheries 2016b). From September through May, they disperse and can be abundant as far south as New Jersey. The range of gray seals appears to be shifting as they are regularly being reported further south than they were historically (Rees *et al.,* 2016).

Gray seals are uncommon in Virginia and the Chesapeake Bay. Only 15 gray seal strandings were documented in Virginia from 1988 through 2013 (Barco and Swingle 2014). They are rarely found resting on the rocks around the portal islands of the CBBT from December through April alongside harbor seals. Seal observation surveys conducted at the CBBT recorded one gray seal in each of the 2014/2015 and 2015/2016 seasons (Rees *et al.,* 2016).

Gray seals are a large seal at around 2–3 meters in length, and can dive to depths of 475 meters to capture prey. Like harbor seals, gray seals spend a fair amount of time hauled out on land to rest, thermoregulate, give birth or avoid predators (Rees *et al.,* 2016).

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, 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), with best hearing estimated to be from 100 Hz to 8 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. Four marine mammal species (two cetacean and two pinniped (two phocid) species) have the reasonable potential to co-occur with the proposed survey activities. Please refer to Table 2. Of the cetacean species that may be present, one is classified as a low-frequency cetacean (*i.e.,* all mysticete species), one is classified as a mid-frequency cetacean (*i.e.,* all delphinid and ziphiid species) and one is classified as a high-frequency cetacean.

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

This section includes a summary and discussion of the ways that components of the specified activity may impact marine mammals and their habitat. The ''Estimated Take 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

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. 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 United States 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*) 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 (*Tursiops truncatus*), beluga whale (*Delphinapterus leucas),* harbor porpoise, and Yangtze finless porpoise (*Neophocoena asiaeorientalis*)); and three species of pinnipeds (northern elephant seal (*Mirounga angustirostris*), 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).

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. Note that any masking event that could possibly rise to Level B harassment under the MMPA would occur concurrently within the zones of behavioral harassment already estimated for vibratory and impact pile driving, and which have already been taken into account in the exposure analysis.

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).

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.

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 timeframe 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 25-foot 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 will be transiting the area and 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 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 be by Level B harassment, in the form of disruption of behavioral patterns for individual marine mammals resulting from exposure to acoustic sources including impact and vibratory pile driving equipment. There is also some potential for auditory injury (Level A harassment) to result, due to larger predicted auditory injury zones. 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.,* impact pile driving, seismic airguns) or intermittent (*e.g.,* scientific sonar) sources.

CTJV's proposed activity includes the use of continuous (vibratory pile driving) and impulsive (impact pile driving) sources, and therefore the 120 and 160 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). CTJV's tunnel project includes the use of impulsive (impact hammer) and non-impulsive (vibratory hammer) sources.

These thresholds are provided in Table 3 below. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2016 Technical Guidance, which may be accessed at: *http://www.nmfs.noaa.gov/pr/acoustics/guidelines.htm.*

TABLE 3—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; $L_{E,LF,24h}$: 183dB	*Cell 2:* $L_{E,LF,24h}$: 199dB.
Mid-Frequency (MF) Cetaceans	*Cell 3:* $L_{pk,flat}$: 230 dB; $L_{E,MF,24h}$: 185dB	*Cell 4:* $L_{E,MF,24h}$: 198 dB.
High-Frequency (HF) Cetaceans	*Cell 5:* $L_{pk,flat}$: 202 dB; $L_{E,HF,24h}$: 155dB	*Cell 6:* $L_{E,HF,24h}$: 173 dB.
Phocid Pinnipeds (PW) (Underwater)	*Cell 7:* $L_{pk,flat}$: 218 dB; $L_{E,PW,24h}$: 185dB	*Cell 8:* $L_{E,PW,24h}$: 201 dB.

TABLE 3—THRESHOLDS IDENTIFYING THE ONSET OF PERMANENT THRESHOLD SHIFT—Continued

Hearing group	PTS Onset acoustic thresholds * (received level)	
	Impulsive	Non-impulsive
Otariid Pinnipeds (OW) (Underwater)	*Cell 9:* $L_{pk,flat}$: 232 dB; $L_{E,OW,24h}$: 203dB	*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 1 μPa²s. 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.

Although CTJV's construction activity includes the use of impulsive (impact pile driving) and non-impulsive (vibratory pile driving and drilling) sources, the shutdown zones set by the applicant are large enough to ensure Level A harassment will be prevented. To assure the largest shutdown zone can be fully monitored, protected species observers (PSOs) will be positioned in the possible best vantage points during all piling/drilling activities to guarantee a shutdown if marine mammals approach or enter the designated shutdown zone. These measures are described in full detail below in the Proposed Mitigation and Proposed Monitoring and Reporting Sections.

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 harassment zone or area exceeding specified noise criteria.

Source Levels

Sound source levels from the PTST project site were not available. Therefore, literature values published for projects similar to the PTST project were used to estimate the amount of sound (RMS SPL) that could potentially be produced. The PTST Project will use round, 36-inch-diameter, hollow steel piles and 28-inch wide sheet piles. Data reported in the Compendium of Pile Driving Sound Data (Caltrans 2015) for similar piles size and types are shown in Table 4. The use of an encased bubble curtain is expected to reduce sound levels by 10 dB (NAVFAC 2014, ICF Jones and Stokes 2009). Using data from previous projects (Caltrans 2015) and the amount of sound reduction expected from each of the sound mitigation methods, we estimated the peak noise level (SPLpeak), the root mean squared sound pressure level (RMS SPL), and the single strike sound exposure level (sSEL) for each pile driving scenario of the PTST project (Table 4).

TABLE 4—THE SOUND LEVELS (dB PEAK, dB RMS, AND dB SSEL) EXPECTED TO BE GENERATED BY EACH HAMMER TYPE/MITIGATION

Type of pile	Hammer type	Estimated peak noise level (dB peak)	Estimated cumulative sound exposure level (dB cSEL)	Estimated pressure level (dB RMS)	Estimated single strike sound exposure level (dB sSEL)	Relevant piles at the PTST project	Pile function
36-inch Steel Pipe	Impact [a]	210	NA	193	183	Battered	Mooring dolphins.
36-inch Steel Pipe	Impact with Bubble Curtain [b].	200	NA	183	173	Plumb	Mooring dolphins and Temporary Pier.
24-inch AZ Sheet	Vibratory [c]	182	NA	154	165	Sheet	Containment Structure.
36-inch Steel Pipe and 24-inch AZ Sheet Pile.	Impact w/Bubble Curtain at PI 1 and PI 2 [d].	200	NA	186	183	Plumb	Mooring Dolphins, Temporary Pier.

TABLE 4—THE SOUND LEVELS (dB PEAK, dB RMS, AND dB SSEL) EXPECTED TO BE GENERATED BY EACH HAMMER TYPE/MITIGATION—Continued

Type of pile	Hammer type	Estimated peak noise level (dB peak)	Estimated cumulative sound exposure level (dB cSEL)	Estimated pressure level (dB RMS)	Estimated single strike sound exposure level (dB sSEL)	Relevant piles at the PTST project	Pile function
36-inch Steel Pipe and 24-inch AZ Sheet Pile.	Impact w/Bubble Curtain at PI 1 and Vibratory at PI 2.	200	NA	183	183	Plumb and Sheet	Mooring Dolphins, Containment Structure.
36-inch Steel Pipe and 24-inch AZ Sheet Pile.	Vibratory at PI 1 and Impact w/Bubble Curtain at PI 2.	200	NA	183	183	Plumb and Sheet	Mooring Dolphins and Containment Structure.

[a] Examples from Caltrans 2015. These examples were the loudest provided in the Caltrans 2015 compendium for 36-inch-diameter hollow steel piles and in the Proxy Source Sound Levels and Potential Bubble Curtain Attenuation for Acoustic Modeling of nearshore marine Pile Driving at Navy Installations in Puget Sound (NAVFAC 2014).

[b] Estimates of sound produced from impact that use sound mitigation measures were developed by subtracting 10 dB for an encased bubble curtain (ICF Jones and Stokes 2009, NAVFAC 2014). A 10-dB reduction in sound for this sound mitigation method is the minimum that may be expected and, therefore, represents a conservative estimate in sound reduction.

[c] Example from NAVFAC 2017. Average 1-second and 10-second Broadband RMS SPL (dB re 1 μPa) for Vibratory Pile-Driving normalized to 10 meters at JEB Little Creek.

[d] Simultaneous pile driving were determined by applying the rules of dB addition outlined in the Biological Assessment Advanced Training Manual Version 4–2017 (WSDOT 2017).

When NMFS's 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's User Spreadsheet predicts the closest distance at which, if a marine mammal remained at that distance the whole duration of the activity, it would not incur PTS. Inputs used in the User Spreadsheet, and the resulting isopleths are reported below.

The Impact Pile Driving (Stationary Source: Impulsive, Intermittent) (Sheet E.1) spreadsheet provided by NOAA Fisheries requires inputs for assorted variables which are shown in Table 4. RMS SPL's for simultaneous pile driving were determined using the rules for dB addition (WSDOT 2017). The expected number of steel piles driven during a 24-hour period would be a maximum of eight for plumb piles and three for battered piles for each portal island. Practical spreading was assumed (15logR) and a pulse duration of 0.1 seconds utilized. The distance from the source where the literature based RMS SPL was 10 meters while the number of strikes per pile was 1,000. Model outputs delineating PTS isopleths are provided in Table 6 assuming impact installation of three battered round steel piles per day and eight plumb round steel piles per day as well as vibratory installation of up to eight sheets per day over eight hours.

The Optional User Spreadsheet for vibratory pile driving (non-impulsive, stationary, continuous) (Sheet A) requires inputs for the sound pressure level of the source (dB RMS SPL), the expected activity duration in hours during per 24-hour period, the propagation of the sound and the distance from the source at which the sound pressure level was measured. Calculations also assumed that the expected activity level duration would be eight hours per Portal Island per 24-hour period. Practical spreading was assumed and the measured distance from the sound source was 10 meters.

The inputs from Table 5 determined isopleths where PTS from underwater sound during impact and vibratory driving as shown in Table 6.

TABLE 5—INPUTS FOR DETERMINING DISTANCES TO CUMULATIVE PTS THRESHOLDS

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	E.1: Impact pile driving (stationary source: impulsive, intermittent)	E.1: Impact pile driving (stationary source: impulsive, intermittent
Pile Type and Hammer Type.	36-in steel impact (battered pile).	36-in steel impact w/bubble curtain (plumb pile).	28-in sheet vibratory	36-in steel impact w/bubble curtain at P1 and P2 (plumb piles).	36-in steel impact w/bubble curtain at P1 (plumb pile) and sheet pile vibratory at P2.
Source Level (RMS SPL)	193	183	154	186	183.
Weighting Factor Adjustment (kHz).	2	2	2.5	2	2.
Number of strikes in 1 h OR number of strikes per pile.	1,000	1,000	NA	1,000	1,000.
Activity Duration (h) within 24-h period OR number of piles per day.	3 steel piles	8 steel piles	8 hours/8 sheets	8 steel piles per portal island.	8 steel piles.
Propagation (xLogR)	15	15	15	15	15.
Distance of source level measurement (meters).	10	10	10	10	10.
Pulse Duration (seconds)	0.1	0.1	NA	0.1	0.1.

TABLE 6—RADIAL DISTANCE (METERS) FROM PILE DRIVEN FROM PORTAL ISLAND 1 (PI 1) AND PORTAL ISLAND 2 (PI 2) TO PTS ISOPLETHS *

Hammer type	Low-frequency cetaceans		Mid-frequency cetaceans		High-frequency cetaceans		Phocid pinnipeds		Applicable piles in the PTST project
	Island 1	Island 2	Island 1	Island 2	Island 1	Island 2	Island 1	Island 2	
Impact (battered) at PI 1 OR PI 2	2,077.2	2,077.2	73.9	73.9	2,474.3	2,474.3	1,111.6	1,111.6	Battered Piles for Mooring Dolphins.
Impact with Bubble Curtain (plumb) at PI 1 OR PI 2.	860.6	860.6	30.6	30.6	1,025.1	1,025.1	460.5	460.5	Plumb Piles for Temporary Pier and Mooring Dolphins.
Vibratory	9.3	9.3	0.8	0.8	13.8	13.8	5.7	5.7	Sheet Piles for Containment.
Impact w/Bubble Curtain (plumb) simultaneous at PI 1 and PI 2.	1,363.9	1,363.9	48.5	48.5	1,624.7	1,624.7	729.9	729.9	Plumb Piles for temporary pier.
Impact w/Bubble Curtain (plumb) simultaneous at PI 1 and Vibratory at PI 2.	860.6	9.3	30.6	0.8	1,025.1	13.8	460.5	5.7	Plumb Piles for Temporary Pier and Mooring Dolphins; Sheet Pile for Containment.
Vibratory at PI 1 and Impact w/Bubble Curtain (plumb) at PI 2 Simultaneous.	9.3	860.6	0.8	30.6	13.8	1,025.1	5.7	460.5	Plumb Piles for temporary pier and Mooring Dolphins; Sheet Pile for Containment.

* Distances based on up to 3 battered round steel piles per day, 8 plumb round steel piles per day, and up to 8 sheets per day over 8 hours.

Table 7 shows the radial distance to Level B isopleths and Table 8 shows the areas of ensonified Level B zones associated with each of the planned driving scenarios.

TABLE 7—RADIAL DISTANCE (METERS) FROM PILE DRIVEN TO LEVEL B ISOPLETHS FOR CETACEANS AND PINNIPEDS

Hearing group sound threshold (dB)	Hammer type driving scenario	Radial distance (m) 160 (impact)/ 120 (vibratory)		Applicable piles in the PTST project
		Island 1	Island 2	
PTS Isopleth to threshold (meters)	Impact (battered)	1,584.9	1,584.9	Battered Piles for Mooring Dolphins.
PTS Isopleth to threshold (meters)	Impact with Bubble Curtain	341.5	341.5	Plumb Piles for Temporary Pier and Mooring Dolphins.
PTS Isopleth to threshold (meters)	Vibratory	1,847.8	1,847.8	Sheet Piles for Containment.
PTS Isopleth to threshold (meters)	Impact w/Bubble Curtain (plumb) at PI 1 and PI 2 simultaneous.	541.2	541.2	Plumb Piles for temporary pier.
PTS Isopleth to threshold (meters)	Impact w/Bubble Curtain (plumb) at PI 1 and Vibratory at PI 2 simultaneous.	341.5	1,847.8	Plumb Piles for Temporary Pier and Mooring Dolphins; Sheet Pile for Containment.
PTS Isopleth to threshold (meters)	Vibratory at PI 1 and Impact w/Bubble Curtain (plumb) at PI 2 simultaneous.	1,847.8	341.5	Plumb Piles for temporary pier and Mooring Dolphins; Sheet Pile for Containment.

TABLE 8—LEVEL B AREAS (km^2) FOR ALL PILE DRIVING SCENARIOS PLANNED FOR USE DURING PTST PROJECT

Scenario	Zone size (km^2)
Impact Plumb	0.45
Impact Simultaneous Plumb	2.08
Impact Battered	8.27
Vibratory Sheet	12.27
Simultaneous Vibratory Sheet and Impact Plumb	12.27

To calculate level B disturbance zones for airborne noise from pile driving, the spherical spreading loss equation (20LogR) was used to determine the Level B zones. The airborne noise threshold for behavioral harassment for all pinnipeds, except harbor seals, is 100 dB RMS re 20 µPa (unweighted) and for harbor seals is 90 dB RMS re 20 µPa (unweighted).

Literature estimates were used to estimate the amount of in-air sound produced from driving a pile above the MHW line (Laughlin 2010a,b). Hollow steel piles that were 30 inches in diameter were used as a close proxy to the 36-inch-diameter hollow steel piles that will be driven at the PTST project. AZ 24-inch sheet pile was used as a proxy for the sheet pile to be driven during the PTST Project (Table 9). Using the spherical spreading loss model with these estimates, Level B isopleths were estimated as shown below in Table 9. Note that the take estimates for pinnipeds were based on surveys which included counts of hauled out animals. Therefore, to avoid double counting, airborne exposures are not evaluated further for purposes of estimating take under the proposed IHA. During any upland pile driving before issuance of the IHA, however, shutdown will occur whenever pinnipeds enter into the Level B zones as depicted below to avoid unauthorized take.

TABLE 9—RADIAL DISTANCE (METERS) FROM PILE DRIVEN ABOVE MHW TO LEVEL B SOUND THRESHOLDS FOR HARBOR SEALS AND GRAY SEALS

Source	Sound level	Level A harassment zone (m)	Level B harassment zone (m)	
			Harbor Seals	Gray Seals
Impact Hammer 36-inch Pile	110 dB_{L5SEQ} at 15m [a]	N/A	150	47

TABLE 9—RADIAL DISTANCE (METERS) FROM PILE DRIVEN ABOVE MHW TO LEVEL B SOUND THRESHOLDS FOR HARBOR SEALS AND GRAY SEALS—Continued

Source	Sound level	Level A harassment zone (m)	Level B harassment zone (m)	
			Harbor Seals	Gray Seals
Vibratory Hammer Assumed equivalent to 24-in sheet.	92 dB_{L5SEQ} at 15m	N/A	19	6

[a] Laughlin 2010a,b as cited in City of Unalaska 2016 IHA for Unalaska Marine Center.

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.

Humpback whales are relatively rare in the Chesapeake Bay but may be found within or near the Chesapeake Bay at any time of the year. Between 1998 and 2014, 11 humpback whale stranding were reported within the Chesapeake Bay (Barco and Swingle 2014). Strandings occurred in all seasons, but were most common in the spring. There is no existing density data for this species within or near the Chesapeake Bay. Populations in the mid-Atlantic have been estimated for humpback whales off the coast of New Jersey with a density of 0.000130 per square kilometer (Whitt *et al.,* 2015). A similar density may be expected off the coast of Virginia.

Bottlenose dolphins are abundant along the Virginia coast and within the Chesapeake Bay and can be seen seen annually in Virginia from May through October. Approximately 65 strandings are reported each year (Barco and Swingle 2014). Stranded bottlenose dolphins have been recorded as far north as the Potomac River in the Chesapeake Bay (Blaylock 1985). A 2016 Navy report on the occurrence, distribution, and density of marine mammals near Naval Station Norfolk and Virginia Beach, Virginia provides seasonal densities of bottlenose dolphins for inshore areas in the vicinity of the project area (Engelhaupt *et al.,* 2016) (Table 10).

There is little data on the occurrence of harbor porpoises in the Chesapeake Bay. Harbor porpoises are the second most common marine mammal to strand in Virginia waters with 58 reported strandings between 2007 through 2016. Unlike bottlenose dolphins, harbor porpoises are found in Virginia in the cooler months, primarily late winter and early spring, and they strand primarily on ocean facing beaches (Barco *et al.,* 2017).

Harbor seals are the most common seal in Virginia (Barco and Swingle 2014). They can be seen resting on the rocks around the portal islands of the CBBT from December through April. They are unlikely to occur in the project area in the summer and early fall. Survey data for in-water and hauled out harbor seals was collected by the United States Navy at the CBBT portal islands from 2014 through 2016 (Rees *et al.,* 2016) (Table 12). Surveys reported 112 harbor seals in the 2014/2015 season and 184 harbor seals during the 2015/2016 season. (Rees *et al.,* 2016).

Gray seals are uncommon in Virginia and the Chesapeake Bay with only 15 gray seal strandings documented in Virginia from 1988–2013 (Barco and Swingle 2014). They are rarely found resting on the rocks around the portal islands of the CBBT from December through April alongside harbor seals. Observation surveys conducted by the Navy at the CBBT portal islands recorded one gray seal in each of the 2014/2015 and 2015/2016 seasons (Rees *et al.,* 2016).

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.

Humpback Whale

As noted previously, humpback whales are rare in the Chesapeake Bay, although they do occur. Density off of the coast of New Jersey, and presumably Virginia and Maryland, is extremely low (0.00013 animals/km^2). Because density is extremely low, the CTJV is requesting and NMFS is proposing one Level B take every two months for the duration of in-water pile driving activities. Pile driving activities are expected to occur over a 10-month period. Therefore, a total of 5 Level B takes of humpback whales is proposed by NMFS.

Bottlenose Dolphin

Total number of takes for bottlenose dolphin were calculated using the seasonal density described above (individuals/km^2/day) of animals within the inshore study area at the mouth of the Chesapeake Bay (Englehaupt *et al.,* 2016). Project specific dolphin densities were calculated within the respective Level B harassment zone and season. Densities were then used to calculate the seasonal takes based on the number and type of pile driving days per season. For example, the density of dolphins in summer months is assumed to be 3.55 dolphins/km^2 * 2.08 km^2 (harassment zone for Simultaneous Plumb Pile driving as shown in Table 8) = 7.38 dolphins/km^2 per day in summer as shown in Table 11. This density was then multiplied by number of simultaneous plumb pile driving days to provide takes for that season *(e.g.* 7.38 dolphins/km^2 * 24 days = 177 estimated summer exposures from simultaneous plumb pile driving). The sum of the anticipated number of seasonal takes resulted in 3,708 estimated exposures as shown in Table 10 split among three stocks. There is insufficient information to apportion the takes precisely to the three stocks present in the area. Given that members of the NNCES stock are thought to occur in or near the Bay in very small numbers, and only during July and August, we will conservatively assume that no more than 100 of the takes will be from this stock. Most animals from this stock spend the summer months in Pamlico Sound and the range of species extends as far south as Beaufort, NC. In colder months, animals are thought to go no farther north than Pamlico Sound. Since members of the southern migratory coastal and northern migratory coastal stocks are known to occur in or near the Bay in greater numbers, we will conservatively assuming that no more than half of the remaining animals (1,804) will accrue to either of these stocks.). The largest level B zone for mid-frequency cetaceans occurs during vibratory driving and extends out 1,847.8 meters. The largest Level A isopleth is 73.9 meters and would occur during installation of three battered piles on a single day. NMFS proposes a shutdown zone that extends 200 m, so no Level A take is proposed.

TABLE 10—SUMMARY OF INFORMATION USED TO CALCULATE BOTTLENOSE DOLPHIN EXPOSURES

Season	Density (individuals per km^2)	Estimated number of pile driving days	Total number of requested takes
Summer 2018	3.55	45	879
Fall 2018	3.88	77	2,242
Winter 2019	0.63	70	464
Spring 2019	1.00	10	123
Total	....	....	3,708

TABLE 11—SEASONAL DAILY TAKE BY DRIVING SCENARIO (SEASONAL DENSITY * SCENARIO ZONE SIZE) AND ESTIMATED NUMBER OF DRIVING DAYS PER SEASON

Season	Impact plumb daily take (days/season)	Impact simultaneous plumb daily take (days/season)	Impact batter daily take (days/season)	Vibratory sheet daily take (days/season)	Simultaneous vibratory sheet and impact plumb daily take (days/season)	Number of pile driving days
Summer	1.61 (0)	7.38 (24)	29.37 (15)	43.55 (6)	43.55 (0)	45
Fall	1.76 (0)	8.06 (36)	32.10 (0)	47.60 (41)	47.60 (0)	77
Winter	0.28 (0)	1.31 (12)	5.21 (0)	7.73 (34)	7.73 (24)	70
Spring	0.45 (0)	2.08 (0)	8.27 (0)	12.27 (9)	12.27 (1)	10

Harbor Porpoise

Little is known about the abundance of arbor porpoises in the Chesapeake Bay. A recent survey of the Maryland Wind Energy Area found that porpoises occur frequently offshore January to May (Wingfield *et al.,* 2017). This finding reflects the pattern of winter and spring strandings in the mid-Atlantic. NMFS will assume that there is a porpoise sighting once during every two months of operations. That would equate to five sightings over ten months. Assuming an average group size of two results in a total estimated take of 10 porpoises. Harbor porpoises are members of the high-frequency hearing group which would have Level A isopleths as large of 2,474 meters during impact installation of three battered piles per day. Given the relatively large Level A zones during impact driving, NMFS proposes to authorize the take of 4 porpoises by Level A take and 6 by Level B take.

Harbor Seal

The number of harbor seals expected to be present in the PTST project area was estimated using survey data for in-water and hauled out seals collected by the United States Navy at the portal islands from 2014 through 2016 (Rees *et al.,* 2016). The survey data were used to estimate the number of seals observed per hour for the months of January–May and October–December between 2014 and 2016. Seal density data are in the format of seal per unit time. Therefore, potential seal exposures were calculated as total number of potential seals per pile driving day (8 hours) multiplied by the number of pile driving days per month. For example, in November seal density data are reported at 0.1 seals per hour, within an 8-hour work day there may be 0.8 seals * 27 work days in November, resulting in 22 seal takes. The anticipated numbers of monthly exposures were summed. NMFS proposes to authorize the take of 7,537 harbor seals (Table 12). The largest level B zone would occur during vibratory driving and extends out 1,847.8 meters from the sound source. The largest Level A isopleth is 1,111.6 meters which would occur during impact installation of three battered piles. The smallest Level A zone during impact driving is 115 meters which would occur when a single steel pile is impact driven at the same time that vibratory driving of sheet piles is occurring. NMFS proposes a shutdown zone for harbor seals of 50 meters since seals are common in the project area and are known to approach the shoreline. A larger shutdown zone would likely result in multiple shutdowns and impede the project schedule. NMFS will assume that 20 percent of the exposed seals will occur within the Level A zone specified for a given scenario. Therefore, NMFS proposes to authorize the Level A take of 1,507 and Level B take of 6,030 harbor seals.

TABLE 12—CALCULATION OF THE NUMBER OF HARBOR SEAL EXPOSURES

Month	Estimated seals per work day	Total pile driving days per month (includes upland driving)	Total number of requested takes
June 2018	Seals not expected to be present.		
July 2018	Seals not expected to be present.		
August 2018	Seals not expected to be present.		
September 2018	Seals not expected to be present.		

TABLE 12—CALCULATION OF THE NUMBER OF HARBOR SEAL EXPOSURES—Continued

Month	Estimated seals per work day	Total pile driving days per month (includes upland driving)	Total number of requested takes
October 2018	Seals not expected to be present.		
November 2018	0.8	27	22
December 2018	20.8	24	499
January 2019	48	42	2,016
February 2019	96	42	4,032
March 2019	88	10	968

Gray Seals

The number of gray seals potentially exposed to Level B harassment in the project area was calculated using the same methodology was used to estimate harbor seal exposures. Survey data recording gray seal observations was collected by the U.S. Navy at the portal islands from 2014 through 2016 (Rees *et al.,* 2016). Potential gray seal exposures were calculated as the number of potential seals per pile driving day (8 hours) multiplied by the number of pile driving days per month. The anticipated numbers of monthly exposures as shown in Table 13 were summed. Therefore, NMFS proposes to authorize take of 67 gray seals by Level B harassment. The Level A isopleths for gray seals are identical to those for harbor seals. Similarly, with a shutdown zone of 50 meters, NMFS proposes to authorize the Level A take of 20 percent of gray seals. Therefore, NMFS proposes to authorize the Level A take of 13 and Level B take of 54 gray seals.

TABLE 13—CALCULATION FOR THE NUMBER OF GRAY SEAL EXPOSURES

Month	Estimated seals per work day	Total pile driving days per month (includes upland driving)	Harbor seal takes
June 2018	Seals not expected to be present.		
July 2018	Seals not expected to be present.		
August 2018	Seals not expected to be present.		
September 2018	Seals not expected to be present.		
October 2018	Seals not expected to be present.		
November 2018	0	27	0
December 2018	0	24	0
January 2019	0	42	0
February 2019	1.6	42	67
March 2019	0	11	0

Table 14 provides a summary of proposed authorized 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
Humpback whale	Gulf of Maine		5	0.61
Bottlenose dolphin	WNA Coastal, Northern Migratory		1,804	16
	WNA Coastal, Southern Migratory		1,804	20
	NNCES		100	12
Harbor porpoise	Gulf of Maine/Bay of Fundy	4	6	<0.01
Harbor seal	Western North Atlantic	1,507	6,030	10
Gray seal	Western North Atlantic	13	54	<0.01

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.

The following mitigation measures are proposed in the IHA:

- *Pile Driving Delay/Shutdown Zone*—For in-water heavy machinery work (using, *e.g.,* standard barges, tug boats, barge-mounted excavators, or clamshell equipment used to place or remove material), a minimum 10 meters shutdown zone shall be implemented. If a marine mammal comes within 10 meters of such operations, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions. This type of work could include (but is not limited to) the following activities: (1) Vibratory pile driving; (2) movement of the barge to the pile location; (3) positioning of the pile on the substrate via a crane (*i.e.,* stabbing the pile); or (4) removal of the pile from the water column/substrate via a crane (*i.e.,* deadpull).
- *Non-authorized Take Prohibited*—If a species for which authorization has not been granted (*e.g.,* North Atlantic right whale, fin whale, harbor porpoise) or a species for which authorization has been granted but the authorized takes are met, is observed approaching or within the Level B Isopleth, 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.
- *Use of Impact Installation*—During pile installation of hollow steel piles, an impact hammer rather than a vibratory hammer will be used to reduce the duration of pile driving decrease the ZOI for marine mammals.
- *Cushion Blocks*—Use of cushion blocks will be required during impact installation. Cushion blocks reduce source levels and, by association, received levels, although exact decreases in sound levels are unknown.
- *Use of Bubble Curtain*—An encased bubble curtain will be used for impact installation of plumb round piles at water depths greater than 3 m (10 ft). Bubble curtains will not function effectively in shallower depths.
- *Soft-Start*—The use of a soft start procedure is believed to provide additional protection to marine mammals by warning or providing a chance to leave the area prior to the hammer operating at full capacity, and typically involves a requirement to initiate sound from the hammer at reduced energy followed by a waiting period. A soft-start procedure will be used for impact pile driving at the beginning of each day's in-water pile driving or any time impact pile driving has ceased for more than 30 minutes. The CTJV will start the bubble curtain prior to the initiation of impact pile driving. The contractor will provide an initial set of strikes from the impact hammer at reduced energy, followed by a 30-second waiting period, then two subsequent sets.
- *Establishment of Additional Shutdown Zones and Monitoring Zones*—For all impact and vibratory pile driving shutdown and monitoring zones will be established and monitored.
- CTJV will establish a shutdown zone of 200 meters for common dolphins and harbor porpoises and 50 meters for harbor and gray seals. The shutdown zones for humpback whales are depicted in Table 16.
- For all impact and vibratory pile driving shutdown and monitoring zones will be established and monitored. Level B zones are shown in Table 15.

TABLE 15—RADIAL DISTANCE (METERS) FROM PILE DRIVEN TO LEVEL B ISOPLETHS FOR CETACEANS AND PINNIPEDS

Hammer type driving scenario	Radial distance (m)	
	Island 1	Island 2
Impact (battered)	1,585	1,585
Impact with Bubble Curtain	350	350
Vibratory	1,850	1,850
Impact w/Bubble Curtain (plumb) at PI 1 and PI 2 simultaneous	540	540
Impact w/Bubble Curtain (plumb) at PI 1 and Vibratory at PI 2 simultaneous	340	1,850
Vibratory at PI 1 and Impact w/Bubble Curtain (plumb) at PI 2 simultaneous	1,850	340

- The Level A zones will depend on the number of piles driven and the presence of marine mammals per 24-hour period. Up to 3 battered piles or 8 plumb steel piles will be driven per 24-hour period using the following adaptive monitoring approach. Monitoring will begin each day using the three-pile Level A zone for battered piles (or eight-pile zone for plumb piles). If after the first pile is driven, no marine mammals have been observed in the Level A zone, then the Level A zone will reduce to the two-pile zone. If no marine mammals are observed within the two-pile shutdown zone during the driving of the second pile, then the Level A zone will reduce to the one-pile zone. However, if a mammal is observed approaching or entering the three-pile Level A zone during the driving of the first pile, then the three-pile Level A zone will be monitored for the remainder of pile driving activities for that day. Likewise, if a marine mammal is observed within the two-pile but not the three-pile Level A zone, then the two-pile Level A zone will be monitored for the remainder of pile driving activities for that day. The same protocol will be followed for installation of up to 8 plumb piles per day.

The Level A isopleths for all authorized species are shown in Table 16. Isopeths associated with low-frequency cetaceans will signify shutdown zones.for humpback and fin whales.

TABLE 16—RADIAL DISTANCE (METERS) FROM PILE DRIVEN TO PTS ZONES FOR CETACEANS AND PHOCID PINNIPEDS FOR SCENARIOS INVOLVING IMPACT HAMMER

Class of marine mammals	Piles per day	Impact hammer (battered pile)	Impact hammer with bubble curtain (plumb pile)	Impact hammer with bubble curtain simultaneous (plumb pile)	Simultaneous driving—vibratory hammer and impact hammer with bubble curtain (plumb pile)
Low-Frequency Cetaceans*	8	N/A	860.6	1,363	860.6
	7	N/A	787.3	1,247	787.3
	6	N/A	710.4	1,125	710.4
	5	N/A	629.1	997	629.1
	4	N/A	542.1	859	542.1
	3	2,077.2	447.5	709	447.5
	2	1,585.2	341.5	541	341.5
	1	998.6	215.1	341	215.1
Mid-Frequency Cetaceans	8	N/A	30.6	48	30.6
	7	N/A	28.0	44	28.0
	6	N/A	25.3	40	25.3
	5	N/A	22.4	35	22.4
	4	N/A	19.3	30	19.3
	3	73.9	15.9	25	15.9
	2	56.4	12.1	19	12.1
	1	35.5	7.7	12.1	7.7
High Frequency Cetaceans	8	N/A	1,025.1	1,624	1,025.1
	7	N/A	937.8	1,4861	937.8
	6	N/A	846.2	1,341	846.2
	5	N/A	749.4	1,187	749.4
	4	N/A	645.8	1,023	645.8
	3	2,474.3	533.1	844	533.1
	2	1,888.3	406.8	644	406.8
	1	1,189.5	256.3	406	256.3
Phocid Pinnipeds	8	N/A	460.5	729	460.5
	7	N/A	412.3	667	412.3
	6	N/A	380.2	602	380.2
	5	N/A	336.7	533	336.7
	4	N/A	290.1	459	290.1
	3	1,111.6	239.5	379	239.5
	2	848.3	182.8	289	182.8
	1	534.4	115.1	182	115.1

*These isopleths serve as shutdown zones for all large whales, including humpback and fin whales.

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).
- Mitigation and monitoring effectiveness.

Visual Monitoring

The following visual monitoring measures are proposed in the IHA:

• 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.

• 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.

• Monitoring distances, in accordance with the identified shutdown zones, Level A zones 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 based on land both at Portal Island No. 1 and Portal Island No. 2 during simultaneous driving. During non-simultaneous a single monitoring location will be identified on the Portal Island with pile driving activity.

• 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.

• If marine mammals are observed, their location within the zones, and their reaction (if any) to pile activities will be documented.

• If weather or sea conditions restrict the observer's ability to observe, or become unsafe, pile installation will be suspended until conditions allow for monitoring to resume.

• 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.

• Monitoring of pile driving shall be conducted by qualified PSOs (see below), who shall have no other assigned tasks during monitoring periods. CVTJV 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.

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

• CTJV 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.

(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:

(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 Level B zone.

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

• Other human activity in the area.

• A summary of the following:

(1) Total number of individuals of each species detected within the Level A and Level B Zone, and estimated as taken if correction factor is applied.

(2) Daily average number of individuals of each species (differentiated by month as appropriate) detected within the Level A and Level B Zone, and estimated as taken, if correction factor is applied.

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, CTJV 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 New England/Mid-Atlantic 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 CTJV to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. CTJV would not be able to resume their activities until notified by NMFS via letter, email, or telephone.

In the event that CTJV 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), CTJV would immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the NMFS New England/Mid-Atlantic 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 CTJV to determine whether modifications in the activities are appropriate.

In the event that CTJV 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), CTJV would report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the NMFS New England/Mid-Atlantic Regional Stranding Coordinator, within 24 hours of the discovery. CTJV would provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network.

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).

CTJV's planned pile driving activities are highly localized. Only a relatively small portion of the Chesapeake Bay may be affected. The project is not expected to have significant adverse effects on marine mammal habitat. No important feeding and/or reproductive areas for marine mammals are known to be near the project area. Project-related activities may cause some fish to leave the area of disturbance, thus temporarily impacting marine mammals' foraging opportunities in a limited portion of their foraging range, but because of the relatively small impacted area of the habitat range utilized by each species that may be affected, the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

A limited number of animals could experience Level A harassment in the form of PTS if they remain within the Level A harassment zone during certain impact driving scenarios. The sizes of the Level A zones are dependent on the number of steel piles driven in a 24-hour period. Up to 8 steel plumb piles or 3 steel battered piles could be driven in a single day, which would result in a relatively large Level A zones. (If fewer piles are driven per day then the Level A zones would be smaller) . However, an animal would have to be within the Level A zones during the driving of all 8 plumb or 3 battered piles. This is unlikely, as marine mammals tend to move away from sound sources. 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.

Exposures to elevated sound levels produced during pile driving activities may cause behavioral responses by an animal, but they are expected to be mild and temporary. Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (*e.g.,* Thorson and Reyff, 2006; Lerma, 2014). Most likely, individuals will simply move away from the sound source and be temporarily displaced from the areas of pile driving, although even this reaction has been observed primarily only in association with impact pile driving. These reactions and behavioral changes are expected to subside quickly when the exposures cease. The pile driving activities analyzed here are similar to, or less impactful than, numerous construction activities conducted in numerous other locations on the east coast, which have taken place with no reported injuries or mortality to marine mammals, and no known long-term adverse consequences from behavioral harassment. Repeated exposures of individuals to levels of sound that may cause Level B harassment are unlikely to result in permanent hearing impairment or to significantly disrupt foraging behavior. Furthermore. Level B harassment will be reduced through use of mitigation measures described herein.

CTJV will employ noise attenuating devices (*i.e.,* bubble curtains, pile caps) during impact driving of plumb steel piles. During impact driving of both plumb and battered piles, implementation of soft start procedures and monitoring of established shutdown zones will be required, significantly reduces any possibility of injury. Given sufficient notice through use of soft start (for impact driving), marine mammals are expected to move away from a sound source. PSOs will be stationed on a portal island whenever pile driving operations are underway at that island. The portal island locations provide a relatively clear view of the shutdown zones as well as monitoring zones. These factors will limit exposure of animals to noise levels that could result in injury.

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 serious injury or mortality is anticipated;
- The area of potential impacts is highly localized;

• No adverse impacts to marine mammal habitat;
• The absence of any significant habitat within the project area, including rookeries, or known areas or features of special significance for foraging or reproduction;
• Anticipated incidents of Level A harassment would likely be mild;
• Anticipated incidents of Level B harassment consist of, at worst, temporary modifications in behavior; and
• The anticipated efficacy of the required mitigation measures in reducing the effects of the specified activity.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the 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.

NMFS has preliminary determined that the estimated Level B take of humpback whale is 0.61 percent of the Gulf of Maine stock ; take of harbor seals is 10 percent of the Western North Atlantic stock; and take of gray seals is <0.01 percent of the Western North Atlantic stock. Estimated take of bottlenose dolphins (3,708), with 100 takes accruing to the NNCES stock and no more than half (1,804) of the remaining takes accruing to either of two migratory coastal stocks represents 12 percent of the NCCES stock (population 823), 16 percent of the Western North Atlantic northern migratory coastal stock (pop. 11,548) and 20 percent of the Western North Atlantic southern migratory coastal stock (pop. 9,173). Additionally, some number of the anticipated takes are likely to be repeat sightings of the same individual, lowering the number of *individuals* taken.

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 CTJV for conducting pile driving and removal activities as part of the PTST project between June 1, 2018 and March 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 the PTST project.

2. General Conditions.

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

(b) The species authorized for taking are of harbor seal (*Phoca vitulina*), gray seal (*Halichoerus grypus*), bottlenose dolphin (*Tursiops spp.*), harbor porpoise (*Phocoena phocoena*) and humpback whale (*Megaptera novaeangliae*).

(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) CTJV 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, CTJV shall operate only during daylight hours.

(b) Use of Bubble Curtain.

(i) CTJV shall employ an encased bubble curtain during impact pile driving of plumb steel piles in water depths greater than 3 m (10 ft).

(c) Use of Soft-Start.—CTJV 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.

(d) Use of cushion blocks shall be required during impact installation.

(e) Establishment of Shutdown Zones.

(i) CTJV shall establish a shutdown zone of 200 meters harbor porpoise and common dolphin.

(ii) CTJV shall establish a shutdown zone of 50 meters for harbor seals.

(iii) CTJV shall establish shutdown zones for large whales (*i.e.* humpback, fin whale) according to low-frequency isopleths provided in Table 16.

(iv) If a marine mammal comes within or approaches the shutdown zone, pile driving operations shall cease.

(v) Pile driving and removal operations shall restart once the marine mammal is visibly seen leaving the zone or after 15 minutes have passed with no sightings.

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

(vii) Shutdown shall occur if a species for which authorization has not been granted or for which the authorized numbers of takes have been met approaches or is observed within the pertinent take zone.

(viii) 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.

(ix) 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 designated Level B Isopleth 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 the observation time period, as indicated in 3(e)(v) above, has elapsed.

(f) Establishment of Level A and Level B Harassment Zones.

(i) CTJV shall establish and monitor a level B zone according to values depicted in Table 15 during all driving activities.

(ii) CTJV shall use an adaptive approach to establish Level A zones during impact pile driving.

(1) The number of plumb piles planned for a given day determines initial Level A zone size as shown in Table 16.

(2) If after the first pile is driven, no marine mammals have been observed in the Level A zone, then the Level A zone shall be reduced to the Level A zone associated with the next lowest number of piles driven per day. If no marine mammals are observed within that zone, the Level A zone shall again be reduced to the next lowest number of piles per day. This trend shall continue until an animal is seen approaching or entering a specified shutdown zone.

(3) If Level A take does occur, the Level A zone size in effect during the initial Level A take shall remain in place for the remainder of the day.

(4) Pile driving activities shall not be conducted when weather/observer conditions do not allow for adequate sighting of marine mammals within the monitoring zone (*e.g.* lack of daylight/fog).

(5) In the event of conditions that prevent the visual detection of marine mammals, impact pile driving shall be curtailed, but pile in progress shall be completed and then pile driving suspended until visibility conditions improve.

4. Monitoring

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

(a) Visual Marine Mammal Observation—CTJV shall collect sighting data and behavioral responses to pile driving for marine mammal species observed in the region of activity during the period of activity. Visual monitoring shall include the following:

(i) 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.

(ii) Protected Species Observers (PSOs) shall be positioned at the best practicable vantage points, taking into consideration security, safety, and space limitations. The PSOs shall be stationed in a location that shall provide adequate visual coverage for the shutdown zone and monitoring zones.

(iii) Monitoring locations shall be based on land both at Portal Island No. 1 and Portal Island No. 2 during simultaneous driving. During non-simultaneous driving a single monitoring location shall be identified on the Portal Island with pile driving activity.

(iv) Monitoring distances, in accordance with the identified shutdown zones, Level A zones 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

(v) CTJV shall adhere to the following observer qualifications:

(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.

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

(vi) CTJV 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.

(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.

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. 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.

(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) Total number of individuals of each species detected within the Level A and Level B Zone, and estimated taken if a correction factor is used;

(vi) Daily average number of individuals of each species (differentiated by month as appropriate) detected within the Level A and Level B Zone, and estimated as taken if correction factor is used;

(vii) Each marine mammal sighting shall include the following:

(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/or Level B zone;

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

(6) Other human activity in the area.

(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, CTJV 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 New England/Mid-Atlantic Regional Stranding Coordinator. The report would include the following information:

(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).

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

(d) In the event that CTJV 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), CTJV would immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the New England/Mid-Atlantic 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 CTJV to determine whether modifications in the activities are appropriate.

(e) In the event that CTJV 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), CTJV would report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the NMFS New England/Mid-Atlantic Regional Stranding Coordinator, within 24 hours of the discovery. CTJV 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 proposed authorization, and any other aspect of this Notice of Proposed IHA for the proposed PTST project. We also request comment on the potential for renewal of this proposed IHA as described in the paragraph below. Please include with your comments any supporting data or literature citations to help inform our final decision on the request for MMPA authorization.

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

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

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

(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.

Donna S. Wieting,

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

[FR Doc. 2018–09032 Filed 4–27–18; 8:45 am]

BILLING CODE 3510–22–P