	Department contact
Antidumping Duty Proceedings	
Monosodium Glutamate from China (A–570–992) (1st Review)	Jacqueline Arrowsmith, (202) 482–5255.
Monosodium Glutamate from Indonesia (A–560–826) (1st Review)	Jacqueline Arrowsmith, (202) 482–5255.
Steel Concrete Reinforcing Bar from Mexico (A–201–844) (1st Review)	Joshua Poole, (202) 482–1293.
Certain Frozen Fish Fillets from Vietnam (A–552–801) (3rd Review)	Matthew Renkey, (202) 482–2312.
Countervailing Duty Proceedings	
Chlorinated Isocyanurates from China (C–570–991) (1st Review)	Mathew Renkey, (202) 482–2312.
Steel Concrete Reinforcing Bar from Turkey (C–489–819) (1st Review)	Joshua Poole, (202) 482–1293.
Suspended Investigations	
No Sunset Review of suspended investigations is scheduled for initiation in October 2019.	

Commerce's procedures for the conduct of Sunset Review are set forth in 19 CFR 351.218. The *Notice of Initiation of Five-Year (Sunset) Review* provides further information regarding what is required of all parties to participate in Sunset Review.

Pursuant to 19 CFR 351.103(c), Commerce will maintain and make available a service list for these proceedings. To facilitate the timely preparation of the service list(s), it is requested that those seeking recognition as interested parties to a proceeding contact Commerce in writing within 10 days of the publication of the Notice of Initiation.

Please note that if Commerce receives a Notice of Intent to Participate from a member of the domestic industry within 15 days of the date of initiation, the review will continue.

Thereafter, any interested party wishing to participate in the Sunset Review must provide substantive comments in response to the notice of initiation no later than 30 days after the date of initiation.

This notice is not required by statute but is published as a service to the international trading community.

Dated: August 19, 2019.

James Maeder,

Deputy Assistant Secretary for Antidumping and Countervailing Duty Operations.

[FR Doc. 2019–18935 Filed 8–30–19; 8:45 am]

BILLING CODE 3510–DS–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XF505

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Construction Activities Associated With the Raritan Bay Pipeline

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

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

SUMMARY: NMFS has received a request from Transcontinental Gas Pipe Line Company, LLC (Transco), a subsidiary of Williams Partners L.P., to take marine mammals incidental to construction activities associated with the Raritan Bay Pipeline. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an incidental harassment authorization (IHA) to incidentally take marine mammals during the specified activities. NMFS is also requesting comments on a possible one-year renewal that could be issued under certain circumstances and if all requirements are met, as described in *Request for Public Comments* at the end of this notice. NMFS will consider public comments prior to making any final decision on the issuance of the requested MMPA authorizations and agency responses will be summarized in the final notice of our decision.

DATES: Comments and information must be received no later than October 3, 2019.

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.Carduner@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 *www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act* 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: Jordan Carduner, 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.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act.* In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

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

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

The definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below.

National Environmental Policy Act

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

This action is consistent with categories of activities identified in Categorical Exclusion B4 of the Companion Manual for NAO 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 proposed action qualifies to be categorically excluded from further NEPA review.

Information in Transco's application and this notice collectively provide the environmental information related to proposed issuance of these regulations and subsequent incidental take authorization for public review and comment. We will review all comments submitted in response to this notice prior to concluding our NEPA process or making a final decision on the request for incidental take authorization.

Summary of Request

On February 7, 2019, NMFS received a request from Transco for an IHA to take marine mammals incidental to construction activities associated with the Raritan Bay Loop pipeline offshore of New York and New Jersey. Transco submitted a revised version of the application on May 23, 2019, and this application was deemed adequate and complete. Transco's request is for take of 10 species of marine mammals by harassment. Neither Transco nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

Description of Proposed Activity

Overview

Transco, a subsidiary of Williams Partners L.P., is proposing to expand its existing interstate natural gas pipeline system in Pennsylvania and New Jersey and its existing offshore natural gas pipeline system in New Jersey and New York waters. The Northeast Supply Enhancement Project would consist of several components, including offshore pipeline facilities in New Jersey and New York. The proposed offshore pipeline facilities would include the Raritan Bay Loop pipeline, which would be located primarily in Raritan Bay, as well as parts of the Lower New York Bay and the Atlantic Ocean.

Construction of the Raritan Bay Loop pipeline would require pile installation and removal, using both impact and vibratory pile driving, which may result in the incidental take of marine mammals. Transco would install and remove a total of 163 piles, which would range in size from 10 to 60 inches in diameter, using a vibratory device and/or diesel impact hammer. These piles would be temporary; they would remain in the water only for the duration of each related offshore construction activity. Once offshore construction of the project is complete, all piles installed by Transco would be removed.

Dates and Duration

In-water construction is anticipated to occur between the 2nd quarter of 2020 and the 4th quarter of 2020. Pile installation and removal activities are planned to occur from June through August 2020. However the timeframe for pile removal may occur in fall 2020. Pile installation and removal activities are expected to take a total of 65.5 days.

Specific Geographic Region

Transco's proposed activity would occur in the waters of Raritan Bay, the Lower New York Bay, and the Atlantic Ocean (see Figure 1 in the IHA application). The Project area is located in the greater New York Bight region. The New York Bight is a triangular-shaped area of the continental shelf generally bounded by Montauk Point on eastern Long Island, Cape May in southern New Jersey, and the open shallows of the Atlantic Ocean. The depth of water in the area averages about 27 meters (m) (90 feet (ft)), except in the northwest-southeast–trending Hudson Canyon, which has depths in excess of 73 m (240 ft) (Ketchem et al. 1951). The New York Bight refers to the bend, or curve, in the shoreline of the open coast and great expanse of shallow ocean between Long Island and the New Jersey coast. Water depths exceed 30 m (100 ft) approximately 80 kilometers (km) (50 statute miles) offshore.

Detailed Description of Specific Activity

Transco is proposing to expand its existing interstate natural gas pipeline system in Pennsylvania and New Jersey and its existing offshore natural gas pipeline system in New Jersey and New York waters with the goal of providing an additional 400,000 dekatherms per day capacity to its customers. To provide this additional capacity, Transco proposes to expand portions of its system from an existing Compressor Station in York County, Pennsylvania, to the Rockaway Transfer Point in New York State waters, which represents the interconnection point between Transco's existing Lower New York Bay Lateral and the existing offshore Rockaway Delivery Lateral (RDL). The proposed project would consist of several components, including onshore pipeline facilities in Pennsylvania and New Jersey and offshore pipeline facilities in New Jersey and New York. Only the offshore pipeline components of the project have the potential to result in the take of marine mammals, thus the onshore components of the project are not analyzed further in this document.

Transco's proposed offshore pipeline facilities include the Raritan Bay Loop pipeline, which would be located primarily in Raritan Bay as well as parts of the Lower New York Bay and the Atlantic Ocean. The Raritan Bay Loop would begin at the onshore connection with the Madison Loop in Middlesex, New Jersey (see Figure 1 in the IHA application). The offshore portion of the Raritan Bay Loop would extend from the Sayreville shoreline approximately 37.6 km (23.3 mi) across Raritan Bay and Lower New York Bay to the Rockaway Transfer Point, which is the interconnection point with the RDL in New York State waters in the Atlantic Ocean, approximately 4.8 km (3 mi) seaward of Rockaway, New York. Approximately 9.6 km (6.0 mi) of the offshore portion of the Raritan Bay Loop route would cross New Jersey waters, while the remaining 28 km (17.4 mi) would cross New York waters. The Raritan Bay Loop would cross a continuous expanse of open marine and estuarine waters in New Jersey and New York, which consists of three major contiguous waterbodies, including Raritan Bay, Lower New York Bay, and the Atlantic Ocean (See Figures 1 and 2 in the IHA application). This area is part of the coastal region known as the New York Bight.

Construction of the Raritan Bay Loop pipeline would require the installation of 163 piles, ranging in size from 10 to 60 inches in diameter, using a vibratory device and/or diesel impact hammer. Impact pile drivers are piston-type drivers that use various means to lift a piston to a desired height and drop the piston against the head of the pile in order to drive it into the substrate (Caltrans, 2015). Diesel impact hammers would be used to install approximately 34 steel piles (Table 1). A vibratory device uses spinning counterweights, causing the pile to vibrate at a high speed. The vibrating pile causes the soil underneath it to ''liquefy'' and allow the pile to move easily into or out of the sediment. Vibratory devices generally have source levels 10 to 20 decibels (dB) lower than impact devices, so their use is considered a means to reduce overall underwater sound when pile driving is necessary for a project and suitable sediment conditions exist (Caltrans, 2015). Vibratory devices would be used to install and remove approximately 163 steel pipe piles (Table 1). Note that some piles would require both impact and vibratory installation.

The total time to install a pile is dependent on the installation method (vibratory or impact), diameter of the pile, substrate composition, and depth the pile needs to penetrate through the substrate. For pile installation of 0.9- to 1.5-m (34- to 60-in) piles using a diesel impact hammer, the estimated time is 38 to 62 minutes per pile. For pile installation of 0.3- to 1.5-m (10- to 60-in) piles using a vibratory hammer, the estimated time is 15 minutes per pile. For pile removal of 0.3- to 1.5-m (10- to 60-in) piles using a vibratory hammer, the estimated time is 5 to 30 minutes per pile. The minimum handling time (*i.e.,* periods during which the pile is being positioned, steadied, etc., and no in-water construction noise is anticipated) is dependent on activity type and pile size. For vibratory hammer periods for 0.3- to 1.2-m (10- to 48-in) piles, the handling time ranges from 15 to 45 minutes. For vibratory hammer periods for 1.5-m (60-in) piles, the minimum handling time is 1 hour and 45 minutes. For impact hammer periods, the minimum handling time is 30 minutes. The total duration of pile installation (including both vibratory and impact pile driving) is estimated at 42.5 days. The piles would remain in the offshore environment only for the duration of each related offshore construction activity. Once offshore construction is complete, all piles would be removed using a vibratory hammer, which is expected to occur over an estimated 23 days. Thus the total duration of pile installation and removal is 65.5 days (*i.e.,* 42.5 days for pile installation and 23 days for pile removal). Installation and removal of all piles is expected to be completed during summer 2020 (June–August); however, pile removal could shift to fall 2020 (September, October, and/or November), after finalization of the construction schedule.

All piles would be installed along a string of locations within Raritan Bay (see Figure 2 in the IHA application). Transco would complete construction of the various components of the offshore pipeline in several stages with overlapping schedules. An overview of these stages and their general sequence are described below.

- *Temporary fixed platform:* During assembly of the fixed platform, vibratory and impact hammers would be used to install the steel piles; vibratory hammers would be used to remove the piles once the work is completed.
- *Pre-trenching, cable crossings, and initial pipelay:* Trenching for the offshore (subsea) pipeline would take place using a clamshell dredging device. One clamshell dredge with an environmental bucket and its supporting scows would be mobilized to first excavate a pit and trench at the offshore horizontal directional drill exit point for the Morgan Shore Approach horizontal directional drill (HDD). Transco would also mobilize a barge equipped with diving, jetting, and material-handling equipment to remove sediment that covers the first Neptune Cable crossing. Transco would then place concrete mattresses on either side of the cable in the excavated areas to create a bridge above the cable. Due to shallow water depths near the Morgan shoreline, a combination of the pipelay barge and the temporary fixed platform would install pipeline in this section of trench. Following completion of a successful hydrostatic test of the pipeline, a clamshell dredge would backfill the trench. A second clamshell dredge with an environmental bucket would begin trenching the Raritan Bay Channel and the Chapel Hill Channel crossing.
- *HDD Crossings:* For the Morgan Shore Approach HDD, Transco would mobilize a marine-support barge. The clamshell dredge (with environmental bucket) would excavate the exit point and then a vibratory device would be used to install the temporary fixed platform and the piles, known as ''goal posts,'' to guide the pipe at the exit point. Transco would assemble the HDD pipe string on the pipelay barge, a winch wire from the fixed platform would be attached to the HDD pipe string that would pull the pipe string into place with the aid of a tug on the tail end section, lay the pipe string on the seafloor, and then complete a hydrostatic test of the pipeline segment. For the Ambrose Channel crossing, Transco would mobilize a clamshell dredge with an environmental bucket and two liftboats with drilling equipment to the Lower New York Bay. The clamshell dredge would excavate pits at the east point and west point, and then a vibratory device would be used to install piles (goal posts) on opposite sides of the Ambrose Channel. Following the goal post installation, dolphin/fender piles (installed using a vibratory device and/or impact hammer), and a casing would be installed at both HDD pits. The HDD string would then be laid and pulled through.
- *Additional Pipelay and Backfill:* Following assembly and installation of the Ambrose Channel HDD described above, an anchored pipelay barge would begin laying pipe on the seafloor from the east Ambrose HDD pit to the Rockaway Neptune cable crossing. The anchored pipelay barge would then relocate to west of the Ambrose Channel entry HDD point and lay the pipeline from the west Ambrose HDD pit to the mid-line tie-in point at milepost (MP) 16.6. After Transco has laid the pipeline, Transco would use a jet trencher to lower the pipeline and a clamshell dredge would backfill the trench near the Ambrose Channel, Ambrose HDD pits, and navigation channels. Transco would bury the pipe to a minimum depth of 1.22 m (4 ft) (or

equivalent) and in accordance with any permit conditions as directed by the USACE.

• *Subsea Manifold Tie-in, Hydrostatic Testing, and Commissioning:* Hand jets would be used to expose the existing subsea manifold at the RDL, and a new tie-in valve spool would be installed. A tie-in skid and tie-in spools would be installed at the end of the Raritan Bay Loop. Transco would seal the Raritan Bay Loop pipeline between the onshore entry point and the tie-in skid and pre-commissioning would then occur, which would include hydrostatic pressure testing of the new pipeline. After completion of the hydrostatic test, a final spool piece would be installed to connect the Raritan Bay Loop to the subsea manifold. The tie-in spools between the tie-in skid and tie-in valve spool would be dewatered, the manifold tie-in location would be backfilled, and Transco would introduce natural gas into the completed Raritan Bay Loop.

The various components of the proposed construction of the Raritan Bay Loop pipeline, including pile type, size and quantity, installation method (*i.e.,* impact or vibratory), and pile driving or removal duration, are shown in Table 1 and are described in greater detail in the IHA application.

TABLE 1—PILE DRIVING SUMMARY FOR RARITAN BAY LOOP, INCLUDING PILE TYPES AND DRIVING DURATIONS

Milepost	Site	Pile type	Purpose	Diameter (in.)	Quantity	Installation method	Installation		Removal	
							Driving time per pile [c]	Duration (days) [d]	Removal time (min./pile)	Duration (days) [d]
12.59	Morgan Shore Approach HDD.	Platform Piles (for temporary fixed platform).	Temporary fixed platform for Morgan Shore Approach HDD.	36	18	Vibratory & Diesel Impact Hammer.	V–15 Min/Pile I–52–62 Min/Pile [e]	4.5	30	3
12.59	Morgan Shore Approach HDD.	Platform Reaction Piles.	Provide additional lateral capacity for pipeline pulling winch.	36	4	Vibratory & Diesel Impact Hammer.	V–15 Min/Pile I–52–62 Min/Pile [e]	2	30	
12.59	Morgan Shore Approach HDD.	Support Barge Fender Piles.	Tie up and breast support barge alongside HDD operations.	36–48	4	Vibratory Hammer	V–15 Min/Pile	2	15	
12.59	Morgan Shore Approach HDD.	Water Barge Fender Piles.	Tie up and breast water barge alongside HDD operations.	36–48	4	Vibratory Hammer	V–15 Min/Pile		15	
12.59	Morgan Shore Approach HDD.	HDD String Goal Posts.	Support HDD string	24	10	Vibratory Hammer	V–15 Min/Pile	3	5	3
13.84	Neptune Power Cable Crossing (MP13.84).	Sleeper Vertical Pile	Provide mechanical protection to ensure separation between Neptune Power cable and pipeline.	10	8	Vibratory Hammer	V–15 Min/Pile	2	15	1.5
14.5 to 16.5	MP14.5 to MP16.5	Morgan Shore Pull Vertical Guide Piles.	Ensure pipeline stays within pipeline corridor during surface tow between MP14.5 to MP16.5.	24	22	Vibratory Hammer	V–15 Min/Pile	5	15	1.5
28.0 to 29.36	MP28.0 to MP29.36	Pipelay Barge Mooring Pile.	Assist pipelay barge with mooring in vicinity of Ambrose Shipping Channel.	34	12	Vibratory Hammer	V–15 Min/Pile	3	30	2
29.4	Ambrose Channel HDD West Side.	W750 Side Piles	Landing of small barges/vessels alongside prior to fender piles being installed.	36	3	Vibratory Hammer	V–15 Min/Pile	1.5	15	0.5
29.4	Ambrose Channel HDD West Side.	Reaction Frame Piles.	Provide additional lateral capacity for HDD pipeline pull.	36–60	8	Vibratory & Diesel Impact Hammer.	V–15 Min/Pile I–38 Min/Pile [e f]	4	30	0.5
29.4	Ambrose Channel HDD West Side.	Support Barge Fender Piles.	Tie up and breast support barge alongside HDD operations.	36–48	4	Vibratory Hammer	V–15 Min/Pile	1.5	15	1
29.4	Ambrose Channel HDD West Side.	Water Barge Fender Piles.	Tie up and breast water barge alongside HDD operations.	36–48	4	Vibratory Hammer	V–15 Min/Pile		15	
29.4	Ambrose Channel HDD West Side.	HDD String Goal Posts.	Support HDD string	24	12	Vibratory Hammer	V–15 Min/Pile	1.5	5	2
30.48	Ambrose Channel HDD East Side.	Ambrose East Vertical Stabilization Piles.	Ensure HDD string is secured while awaiting pullback.	24	22	Vibratory Hammer	V–15 Min/Pile	5	15	0.5
30.48	Ambrose Channel HDD East Side.	W751 Side Piles	Landing of small barges/vessels alongside prior to fender piles being installed.	36	3	Vibratory Hammer	V–15 Min/Pile	0.5	15	0.5
30.48	Ambrose Channel HDD East Side.	Support Barge Fender Piles.	Tie up and breast support barge alongside HDD operations.	36–48	4	Vibratory Hammer	V–15 Min/Pile	1	15	1
30.48	Ambrose Channel HDD East Side.	HDD Drill String Goal Posts.	Support HDD string	24	10	Vibratory Hammer	V–15 Min/Pile	1.5	5	2
30.48	Ambrose Channel HDD East Side.	Pipelay Barge Mooring Pile.	Assist pipelay barge with mooring at Ambrose East.	60	1	Vibratory Hammer	V–15 Min/Pile [f]	0.5	15	1
34.5 to 35.04	MP34.5 to MP35.04	Pipelay Barge Mooring Pile.	Assist pipelay barge with mooring.	34	4	Vibratory & Diesel Impact Hammer.	V–15 Min/Pile I–52 Min/Pile [e]	3	15	2

TABLE 1—PILE DRIVING SUMMARY FOR RARITAN BAY LOOP, INCLUDING PILE TYPES AND DRIVING DURATIONS—Continued

Milepost	Site	Pile type	Purpose	Diameter (in.)	Quantity	Installation method	Installation		Removal	
							Driving time per pile [c]	Duration (days) [d]	Removal time (min./pile)	Duration (days) [d]
35.04	Neptune Power Cable Crossing (MP35.04).	Crossing Pile	Ensure temporary stability of pipeline at crossing location.	10	2	Vibratory Hammer	V–15 Min/Pile	1	15	1

Underwater sound produced during impact pile driving and vibratory driving and removal could result in incidental take of marine mammals by Level B harassment and, for some species, Level A harassment.

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 IHA 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' Stock Assessment Reports (SARs; *www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*) and more general information about these species (*e.g.,* physical and behavioral descriptions) may be found on NMFS' website (*www.fisheries.noaa.gov/find-species*).

There are 42 marine mammal species that have been documented within the U.S. Atlantic Exclusive Economic Zone (EEZ). However, 29 of these species are not expected to occur within the project area, based on a lack of sightings in the area and their known habitat preferences and distributions, which are generally further offshore and at greater depths than the project area. These are: The blue whale (*Balaenoptera musculus*), sei whale (*Balaenoptera borealis*), Bryde's whale (*Balaenoptera edeni*), sperm whale (*Physeter macrocephalus*), dwarf and pygmy sperm whale (*Kogia sima* and *Kogia breviceps*), beluga whale (*Delphinapterus leucas*), northern bottlenose whale (*Hyperoodon ampullatus*), killer whale (*Orcinus orca*), pygmy killer whale (*Feresa attenuata*), false killer whale (*Pseudorca crassidens*), melon-headed whale (*Peponocephala electra*), Risso's dolphin (*Grampus griseus*), striped dolphin (*Stenella coeruleoalba*), Atlantic spotted dolphin (*Stenella frontalis*), white-beaked dolphin (*Lagenorhynchus albirostris*), pantropical spotted dolphin (*Stenella attenuata*), Fraser's dolphin (*Lagenodelphis hosei*), rough-toothed dolphin (*Steno bredanensis*), Clymene dolphin (*Stenella clymene*), spinner dolphin (*Stenella longirostris*), hooded seal (*Cystophora cristata*), ringed seal (*Pusa hipsida*), Cuvier's beaked whale (*Ziphius cavirostris*), four species of Mesoplodont beaked whale (*Mesoplodon* spp.), and the West Indian manatee (*Trichechus manatus latirostris*) (which occurs further south than the project area). These species are not analyzed further in this document.

There are 13 marine mammal species that could potentially occur in the proposed project area and that are included in Table 10 of the IHA application. However, the temporal and/or spatial occurrence of three of the species listed in Table 10 of the IHA application is such that take of these species is not expected to occur, and they are therefore not discussed further beyond the explanation provided here. Take of these species is not anticipated either because they have very low densities in the project area, or because of their likely occurrence in habitat that is outside the project area, based on the best available information. The Atlantic white-sided dolphin (*Lagenorhynchus acutus*) occurs throughout temperate and sub-polar waters of the North Atlantic, most prominently in continental shelf waters to depths of approximately 100 m (330 ft) (Hayes et al., 2018). Though recent survey data in unavailable, Atlantic white-sided dolphins were found primarily east and north of Long Island and the project area based on observations made during the Cetaceans and Turtle Assessment Program (CeTAP) surveys from 1978 to 1982 (CeTAP, 1982). The Atlantic white-sided dolphins observed south of Long Island were farther offshore in the deeper water of the continental shelf proper and closer to the continental shelf slope. There are two pilot whale species in the western North Atlantic: The long-finned pilot whale (*Globicephala melas melas),* and short-finned pilot whale (*Globicephala macrorhynchus).* The latitudinal ranges of the two species remain uncertain, although south of Cape Hatteras, most pilot whale sightings are expected to be short-finned pilot whales, while north of ~42° N most pilot whale sightings are expected to be long-finned pilot whales, and the two species overlap spatially along the mid-Atlantic shelf break between New Jersey and the southern flank of Georges Bank (Hayes *et al.,* 2018). The available data suggests that long-finned pilot whales are more common along the continental shelf off the northeast coast of the United States during winter and early spring, and move into the more northerly waters of Georges Bank and the Gulf of Maine from late spring through autumn (CeTAP, 1982). Both species prefer deeper offshore waters compared to the relatively shallow waters of the project area, are not often observed in the waters overlying the continental shelf proper and are more commonly seen at the continental shelf break and farther offshore on the slope. As these species are not expected to occur in the project area during the proposed activities, they are not discussed further in this document.

We expect that the species listed in Table 2 will potentially occur in the project area and will potentially be taken as a result of the proposed project. Table 2 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 (2018). 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' SARs). While no mortality is anticipated or authorized here, PBR is included here as a gross indicator 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' stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS' U.S. Atlantic SARs. All values presented in Table 2 are the most recent available at the time of publication and are available in the 2017 Atlantic SARs (Hayes *et al.,* 2018) or draft 2018 SARs, available online at: *www.fisheries.noaa.gov/action/2018-draft-marine-mammal-stock-assessment-reports-available.*

TABLE 2—MARINE MAMMALS KNOWN TO OCCUR IN THE PROJECT AREA THAT MAY BE AFFECTED BY THE PROPOSED ACTIVITY

Common name (scientific name)	Stock	MMPA and ESA status; strategic (Y/N) [1]	Stock abundance (CV, N_{min}, most recent abundance survey) [2]	Predicted abundance (CV) [3]	PBR [4]	Annual M/SI [4]	Occurrence and seasonality in project area
Toothed whales (Odontoceti)							
Bottlenose dolphin (*Tursiops truncatus*).	W. North Atlantic, Offshore.	-; N	77,532 (0.40; 56,053; 2011).	[5] 97,476 (0.06)	561	39.4	Rare in summer; absent in winter.
	W. North Atlantic Coastal Migratory.	-; N	6,639 (0.41; 4,759; 2015).		48	unknown	Common year round.
Common dolphin [6] (*Delphinus delphis*).	W. North Atlantic	-; N	173,486 (0.55; 55,690; 2011).	86,098 (0.12)	557	406	Common year round.
Harbor porpoise (*Phocoena phocoena*).	Gulf of Maine/Bay of Fundy.	-; N	79,833 (0.32; 61,415; 2011).	* 45,089 (0.12)	706	255	Common year round.
Baleen whales (Mysticeti)							
North Atlantic right whale (*Eubalaena glacialis*).	W. North Atlantic	E; Y	451 (0; 455; n/a)	* 535 (0.45)	0.9	56	Year round in continental shelf and slope waters, occur seasonally.
Humpback whale [7] (*Megaptera novaeangliae*).	Gulf of Maine	-; N	896 (0.42; 239; n/a)	* 1,637 (0.07)	14.6	9.8	Common year round.
Minke whale [6] (*Balaenoptera acutorostrata*).	Canadian East Coast	-; N	20,741 (0.3; 1,425; n/a)	* 2,112 (0.05)	14	7.5	Year round in continental shelf and slope waters, occur seasonally.
Earless seals (Phocidae)							
Gray seal [8] (*Halichoerus grypus*).	W. North Atlantic	-; N	27,131 (0.10; 25,908; n/a).	....	1,389	5,688	Common year round.
Harbor seal (*Phoca vitulina*)	W. North Atlantic	-; N	75,834 (0.15; 66,884; 2012).	....	2,006	345	Common year round.
Harp seal (*Pagophilus groenlandicus*).	W. North Atlantic	-; N	7,411,000 (unk.; unk; 2014).		unk	225,687	Rare.

[1] 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 (see footnote 3) 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] Stock abundance as reported in NMFS marine mammal stock assessment reports (SAR) except where otherwise noted. SARs available online at: *www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments.* CV is coefficient of variation; N_{min} is the minimum estimate of stock abundance. In some cases, CV is not applicable. For certain stocks, abundance estimates are actual counts of animals and there is no associated CV. The most recent abundance survey that is reflected in the abundance estimate is presented; there may be more recent surveys that have not yet been incorporated into the estimate. All values presented here are from the 2018 draft Atlantic SARs.

[3] This information represents species- or guild-specific abundance predicted by recent habitat-based cetacean density models (Roberts *et al.,* 2016, 2017, 2018). These models provide the best available scientific information regarding predicted density patterns of cetaceans in the U.S. Atlantic Ocean, and we provide the corresponding abundance predictions as a point of reference. Total abundance estimates were produced by computing the mean density of all pixels in the modeled area and multiplying by its area. For those species marked with an asterisk, the available information supported development of either two or four seasonal models; each model has an associated abundance prediction. Here, we report the maximum predicted abundance.

[4] Potential biological removal, 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 size (OSP). Annual M/SI, found in NMFS' SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (*e.g.,* commercial fisheries, subsistence hunting, ship strike). Annual M/SI values often cannot be determined precisely and is in some cases presented as a minimum value. All M/SI values are as presented in the draft 2018 SARs.

[5] Abundance estimates are in some cases reported for a guild or group of species when those species are difficult to differentiate at sea. Similarly, the habitat-based cetacean density models produced by Roberts *et al.* (2016) are based in part on available observational data which, in some cases, is limited to genus or guild in terms of taxonomic definition. Roberts *et al.* (2016) produced a density model for bottlenose dolphins that does not differentiate between offshore and coastal stocks.

[6] Abundance as reported in the 2007 Canadian Trans-North Atlantic Sighting Survey (TNASS), which provided full coverage of the Atlantic Canadian coast (Lawson and Gosselin, 2009). Abundance estimates from TNASS were corrected for perception and availability bias, when possible. In general, where the TNASS survey effort provided superior coverage of a stock's range (as compared with NOAA shipboard survey effort), the resulting abundance estimate is considered more accurate than the current NMFS abundance estimate (derived from survey effort with inferior coverage of the stock range). NMFS stock abundance estimate for the common dolphin is 70,184. NMFS stock abundance estimate for the fin whale is 1,618. NMFS stock abundance estimate for the minke whale is 2,591.

[7] 2018 U.S. Atlantic draft SAR for the Gulf of Maine feeding population lists a current abundance estimate of 896 individuals. However, we note that the estimate is defined on the basis of feeding location alone (*i.e.,* Gulf of Maine) and is therefore likely an underestimate.

[8] NMFS stock abundance estimate applies to U.S. population only, actual stock abundance is approximately 505,000.

Two marine mammal species that are listed under the Endangered Species Act (ESA) may be present in the project area and may be taken incidental to the proposed activity: The North Atlantic right whale and fin whale.

Below is a description of the species that have the highest likelihood of occurring in the project area and are thus expected to potentially be taken by the proposed activities. For the majority of species potentially present in the specific geographic region, NMFS has designated only a single generic stock (*e.g.,* ''western North Atlantic'') for management purposes. This includes the ''Canadian east coast'' stock of minke whales, which includes all minke whales found in U.S. waters is also a generic stock for management purposes. For humpback whales, NMFS defines stocks on the basis of feeding locations, *i.e.,* Gulf of Maine. However, references to humpback whales in this document refer to any individuals of the species that are found in the specific geographic region. Any biologically important areas (BIAs) that overlap spatially with the project area are addressed in the species sections below.

North Atlantic Right Whale

The North Atlantic right whale ranges from calving grounds in the southeastern United States to feeding grounds in New England waters and into Canadian waters (Hayes *et al.,* 2018). Surveys have demonstrated the existence of seven areas where North Atlantic right whales congregate seasonally, including north and east of the proposed project area in Georges Bank, off Cape Cod, and in Massachusetts Bay (Hayes *et al.,* 2018). In the late fall months (*e.g.,* October), right whales are generally thought to depart from the feeding grounds in the North Atlantic and move south to their calving grounds off Georgia and Florida. However, recent research indicates our understanding of their movement patterns remains incomplete (Davis *et al.* 2017). A review of passive acoustic monitoring data from 2004 to 2014 throughout the western North Atlantic demonstrated nearly continuous year-round right whale presence across their entire habitat range (for at least some individuals), including in locations previously thought of as migratory corridors, suggesting that not all of the population undergoes a consistent annual migration (Davis *et al.* 2017). In recent years, right whales have been observed off Long Island during the summer, outside of the migration period (NEFSC, 2019). According to the NMFS Northeast Fisheries Science Center's (NEFSC) North Atlantic Right Whale Sighting Advisory System, 50 right whale observations were reported in the waters south of Long Island and north of New Jersey between May 2004 and May 2019, with 6 observations in the project area (NEFSC, 2019). The project area is not a known feeding area for right whales and right whales are not expected to be foraging along the southern coast of Long Island, including the project area, as their main prey species are typically concentrated in offshore waters several miles seaward of the Project area, and right whale foraging behavior has never been documented near the coast of Long Island. Therefore, any right whales in the vicinity of the project area are expected to be transient, most likely migrating through the area.

The western North Atlantic population demonstrated overall growth of 2.8 percent per year between 1990 to 2010, despite a decline in 1993 and no growth between 1997 and 2000 (Pace *et al.* 2017). However, since 2010 the population has been in decline, with a 99.99 percent probability of a decline of just under 1 percent per year (Pace *et al.* 2017). Between 1990 and 2015, calving rates varied substantially, with low calving rates coinciding with all three periods of decline or no growth (Pace *et al.* 2017). On average, North Atlantic right whale calving rates are estimated to be roughly half that of southern right whales (*Eubalaena australis*) (Pace *et al.* 2017), which are increasing in abundance (NMFS 2015). In 2018, no new North Atlantic right whale calves were documented in their calving grounds; this represented the first time since annual NOAA aerial surveys began in 1989 that no new right whale calves were observed. Seven right whale calves were documented in 2019. The current best estimate of population abundance for the species is 411 individuals, based on data as of September 4, 2018 (Pettis et al., 2018).

Elevated North Atlantic right whale mortalities have occurred since June 7, 2017 along the U.S. and Canadian coast. A total of 27 confirmed dead stranded whales (19 in Canada; 8 in the United States) have been documented. This event has been declared an Unusual Mortality Event (UME), with human interactions, including entanglement in fixed fishing gear and vessel strikes, implicated in at least 13 of the mortalities thus far. More information is available online at: *www.fisheries.noaa.gov/national/marine-life-distress/2017-2019-north-atlantic-right-whale-unusual-mortality-event.*

NMFS' regulations at 50 CFR 224.105 designated nearshore waters of the Mid-Atlantic Bight as Mid-Atlantic U.S. Seasonal Management Areas (SMA) for right whales in 2008. SMAs were developed to reduce the threat of collisions between ships and right whales around their migratory route and calving grounds. A portion of one SMA, which is associated with the port of New York and New Jersey, overlaps spatially with the easternmost part of the project area (see Figure 7 in the IHA application). The SMA that occurs off New York and New Jersey is active from November 1 through April 30 of each year.

Fin Whale

Fin whales are common in waters of the U. S. Atlantic EEZ, principally from Cape Hatteras northward (Waring *et al.,* 2016). Fin whales are present north of 35-degree latitude in every season and are broadly distributed throughout the western North Atlantic for most of the year, though densities vary seasonally (Waring *et al.,* 2016). Fin whales are found in small groups of up to five individuals (Brueggeman *et al.,* 1987). Fin whales have been observed in the waters off the eastern end of Long Island, but are more common in deeper waters and would not be expected to occur within Raritan Bay.

Humpback Whale

Humpback whales are found worldwide in all oceans. Humpback whales were listed as endangered under the Endangered Species Conservation Act (ESCA) in June 1970. In 1973, the ESA replaced the ESCA, and humpbacks continued to be listed as endangered. NMFS recently evaluated the status of the species, and on September 8, 2016, NMFS divided the species into 14 distinct population segments (DPS), removed the current species-level listing, and in its place listed four DPSs as endangered and one DPS as threatened (81 FR 62259; September 8, 2016). The remaining nine DPSs were not listed. The West Indies DPS, which is not listed under the ESA, is the only DPS of humpback whale that is expected to occur in the project area.

There have been anecdotal reports of increased sightings of live humpback whales in the project area (Hynes, 2016; Brown *et al.,* 2018a). Between 2011 and 2016, there have been at least 46 humpback whale sightings within Lower New York Bay, Upper New York Bay, and Raritan Bay (Brown *et al.,* 2018a). Most sightings occurred during the summer months (July to September), with no documented sightings in the winter (Brown *et al.,* 2018). A total of 617 humpback whale sightings were reported within the New York Bight based on data collected from 2011–2017 (Brown *et al.,* 2018). During winter, the majority of humpback whales from North Atlantic feeding areas mate and calve in the West Indies, where spatial and genetic mixing among feeding groups occurs, though significant numbers of animals are found in mid- and high-latitude regions at this time and some individuals have been sighted repeatedly within the same winter season, indicating that not all humpback whales migrate south every winter (Hayes *et al.,* 2018).

Since January 2016, elevated humpback whale mortalities have occurred along the Atlantic coast from Maine to Florida. Partial or full necropsy examinations have been conducted on approximately half of the 99 known cases. Of the whales examined, about 50 percent had evidence of human interaction, either ship strike or entanglement. While a portion of the whales have shown evidence of pre-mortem vessel strike, this finding is not consistent across all whales examined and more research is needed. NOAA is consulting with researchers that are conducting studies on the humpback whale populations, and these efforts may provide information on changes in whale distribution and habitat use that could provide additional insight into how these vessel interactions occurred. Three previous UMEs involving humpback whales have occurred since 2000, in 2003, 2005, and 2006. More information is available at: *www.fisheries.noaa.gov/national/marine-life-distress/2016-2019-humpback-whale-unusual-mortality-event-along-atlantic-coast.*

Minke Whale

Minke whales occur in temperate, tropical, and high-latitude waters. The Canadian East Coast stock can be found in the area from the western half of the Davis Strait (45° W) to the Gulf of Mexico (Hayes *et al.,* 2018). This species generally occupies waters less than 100 m deep on the continental shelf. There appears to be a strong seasonal component to minke whale distribution (Hayes *et al.,* 2018). During spring and summer, they appear to be widely distributed from just east of Montauk Point, Long Island, northeast to Nantucket Shoals, and north towards Stellwagen Bank and Jeffrey's Ledge (CeTAP, 1982). During the fall, their range is much smaller and their abundance is reduced throughout their range (CeTAP, 1982). During the winter, they are largely absent from the vicinity of the project area (Waring *et al.,* 2012).

Since January 2017, elevated minke whale mortalities have occurred along the Atlantic coast from Maine through South Carolina, with a total of 61 strandings recorded when this document was written. This event has been declared a UME. Full or partial necropsy examinations were conducted on more than 60 percent of the whales. Preliminary findings in several of the whales have shown evidence of human interactions or infectious disease, but these findings are not consistent across all of the whales examined, so more research is needed. More information is available at: *www.fisheries.noaa.gov/national/marine-life-distress/2017-2019-minke-whale-unusual-mortality-event-along-atlantic-coast.*

Common Dolphin

The common dolphin is found world-wide in temperate to subtropical seas. In the North Atlantic, common dolphins are typically found over the continental shelf between the 100-m and 2,000-m isobaths and over prominent underwater topography and east to the mid-Atlantic Ridge (Hayes *et al.,* 2018), but may be found in shallower shelf waters as well. Common dolphins occur primarily east and north of Long Island and may occur in the project area during all seasons (CeTAP, 1982). Between 2011 and 2015, 68 common dolphins stranded in New York and 53 stranded in New Jersey (Hayes et al., 2018). During 2013, 23 common dolphins stranded along the Long Island coast (RFMRP 2014).

Bottlenose Dolphin

There are two distinct bottlenose dolphin mophotypes in the western North Atlantic: The coastal and offshore forms (Hayes *et al.,* 2018). The two mophotypes are genetically distinct based upon both mitochondrial and nuclear markers (Hoelzel *et al.* 1998; Rosel *et al.* 2009). The offshore form is distributed primarily along the outer continental shelf and continental slope in waters greater than 40 m from Georges Bank to the Florida Keys (Hayes et al., 2018). The Western North Atlantic Northern Migratory Coastal stock occupies coastal waters from the shoreline to approximately the 20-m isobath between Assateague, Virginia, and Long Island, New York during warm water months. The stock migrates in late summer and fall and, during cold water months (best described by January and February), occupies coastal waters from approximately Cape Lookout, North Carolina, to the North Carolina/Virginia border (Garrison *et al.,* 2017). Based on the known distribution of the Western North Atlantic Northern Migratory Coastal stock, this stock could potentially occur in the vicinity of the project during area during the the proposed project; however, Sandy Hook, NJ (southeast of Raritan Bay) represents the northern extent of the stock's range, and there have been no confirmed sightings of the stock within the project area itself (Hayes *et al.,* 2018).

Harbor Porpoise

Harbor porpoises occur from the coastline to deep waters (>1800 m; Westgate *et al.* 1998), although the majority of the population is found over the continental shelf in waters less than 150 m (Hayes *et al.,* 2018). In the project area, only the Gulf of Maine/Bay of Fundy stock of harbor porpoise may be present. This stock is found in U.S. and Canadian Atlantic waters and is concentrated in the northern Gulf of Maine and southern Bay of Fundy region, but their range extends to North Carolina, depending on the season (Hayes *et al.* 2018). In 2011, six sightings were recorded inside Long Island Sound with one sighting recorded just outside the Sound (NEFSC and SEFSC, 2011). Between 2011 and 2015, 33 harbor porpoises stranded in New York and 17 stranded in New Jersey (Hayes *et al.,* 2018).

Harbor Seal

The harbor seal is found in all nearshore waters of the North Atlantic and North Pacific Oceans and adjoining seas above about 30° N (Burns, 2009). In the western North Atlantic, harbor seals are distributed from the eastern Canadian Arctic and Greenland south to southern New England and New York, and occasionally to the Carolinas (Hayes *et al.,* 2018). Their presence in the region of the project area is seasonal, with increasing numbers from October to March and a peak in mid-March (Hoover *et al.,* 2013), when adults, sub-adults, and juveniles are expected to migrate south from Maine. They return north to the coastal waters of Maine and Canada in late spring (Katona *et al.,* 1993). The closest known haulout sites for harbor seals in the vicinity of the project area are located 2.9 km (1. 8 mi) southwest of the Ambrose Channel Crossing site (Sandy Hook Beach) and 16.1 km (10 statute miles) east of the MP14.5 to MP16.5 site (Sandy Hook Beach), with additional haulout sites along the neighboring islands to the north (CRESLI, 2019). The Coastal Research and Education Society of Long Island (CRESLI) has monitored seal populations in the project area for over 15 years and continues to conduct behavioral and population studies of seals around Long Island, including regular observations at a major haulout site at Cupsogue Beach Park, located approximately 96.6 km (60 mi) north of the project area on the eastern shore of Long Island. There are approximately 26 haulout locations around Long Island, and CRESLI has documented a total of 18,321 harbor seals during 334 surveys since 2004 (CRESLI, 2019).

Since July 2018, elevated numbers of harbor seal and gray seal mortalities have occurred across Maine, New Hampshire and Massachusetts. This event has been declared a UME. Additionally, stranded seals have shown clinical signs as far south as Virginia, although not in elevated numbers, therefore the UME investigation now encompasses all seal strandings from Maine to Virginia. Lastly, ice seals (harp and hooded seals) have also started stranding with clinical signs, again not in elevated numbers, and those two seal species have also been added to the UME investigation. A total of 1,593 reported strandings (of all species) had occurred as of the writing of this document. Full or partial necropsy examinations have been conducted on some of the seals and samples have been collected for testing. Based on tests conducted thus far, the main pathogen found in the seals is phocine distemper virus. NMFS is performing additional testing to identify any other factors that may be involved in this UME. Information on this UME is available online at: *www.fisheries.noaa.gov/new-england-mid-atlantic/marine-life-distress/2018-2019-pinniped-unusual-mortality-event-along.*

Gray Seal

There are three major populations of gray seals found in the world; eastern Canada (western North Atlantic stock), northwestern Europe and the Baltic Sea. Gray seals in the project area belong to the western North Atlantic stock. The range for this stock is from New Jersey to Labrador. Current population trends show that gray seal abundance is likely increasing in the U.S. Atlantic EEZ (Hayes *et al.,* 2018). Although the rate of increase is unknown, surveys conducted since their arrival in the 1980s indicate a steady increase in abundance in both Maine and Massachusetts (Hayes *et al.,* 2018). It is believed that recolonization by Canadian gray seals is the source of the U.S. population (Hayes *et al.,* 2018). The closest known haulout sites for gray seals in the vicinity of the project area are located 2.9 km (1.8 mi) southwest of the Ambrose Channel Crossing site (Sandy Hook Beach) and 16.1 km (10 mi) east of the MP14.5 to MP16.5 site (Sandy Hook Beach). Additional haulout sites are likely Little Gull Island in the Long Island Sound (CRESLI, 2019). Gray seals also haul out on Great Gull Island and Little Gull Island in eastern Long Island Sound (DiGiovanni *et al.,* 2015).

As described above, elevated seal mortalities, including gray seals, have occurred from Maine to Virginia since July 2018. This event has been declared a UME, with phocine distemper virus identified as the main pathogen found in the seals. NMFS is performing additional testing to identify any other factors that may be involved in this UME. Information on this UME is available online at: *www.fisheries.noaa.gov/new-england-mid-atlantic/marine-life-distress/2018-2019-pinniped-unusual-mortality-event-along.*

Harp Seal

Harp seals are highly migratory and occur throughout much of the North Atlantic and Arctic Oceans (Hayes *et al.,* 2018). Breeding occurs between late-February and April and adults then assemble on suitable pack ice to undergo the annual molt. The migration then continues north to Arctic summer feeding grounds. Harp seal occurrence in the project area is considered rare. However, since the early 1990s, numbers of sightings and strandings have been increasing off the east coast of the United States from Maine to New Jersey (Katona *et al.* 1993; Rubinstein 1994; Stevick and Fernald 1998; McAlpine 1999; Lacoste and Stenson 2000; Soulen *et al.* 2013). These extralimital appearances usually occur in January–May (Harris *et al.* 2002), when the western North Atlantic stock is at its most southern point of migration. Between 2011 and 2015, 78 harp seals stranded (mortalities) in New York and 22 stranded (mortalities) in New Jersey (Hayes *et al.,* 2018). During 2013, eight harp seals stranded (mortalities and alive) on Long Island (RFMRP, 2014). All of those strandings occurred between January and June.

As described above, elevated seal mortalities, including harp seals, have occurred across Maine, New Hampshire and Massachusetts, and as far south as Virginia, since July 2018. This event has been declared a UME, with phocine distemper virus identified as the main pathogen found in the seals. NMFS is performing additional testing to identify any other factors that may be involved in this UME. Information on this UME is available online at: *www.fisheries.noaa.gov/new-england-mid-atlantic/marine-life-distress/2018–2019-pinniped-unusual-mortality-event-along.*

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Current data indicate that not all marine mammal species have equal hearing capabilities (*e.g.,* Richardson *et al.,* 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007, 2019) recommended that marine mammals be divided into functional hearing groups based on directly measured or estimated hearing ranges on the basis of available behavioral response data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. Note that no direct measurements of hearing ability have been successfully completed for mysticetes (*i.e.,* low-frequency cetaceans). Subsequently, NMFS (2018) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 decibel (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. Marine mammal hearing groups and their associated hearing ranges are provided in Table 3.

TABLE 3—MARINE MAMMAL HEARING GROUPS (NMFS, 2018)

Hearing group	Generalized hearing range *
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 35 kHz.
Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz.
High-frequency (HF) cetaceans (true porpoises, *Kogia,* river dolphins, cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*).	275 Hz to 160 kHz.
Phocid pinnipeds (PW) (underwater) (true seals)	50 Hz to 86 kHz.

TABLE 3—MARINE MAMMAL HEARING GROUPS (NMFS, 2018)—Continued

Hearing group	Generalized hearing range *
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 39 kHz.

* Represents the generalized hearing range for the entire group as a composite (*i.e.,* all species within the group), where individual species' hearing ranges are typically not as broad. Generalized hearing range chosen based on ~65 dB threshold from normalized composite audiogram, with the exception for lower limits for LF cetaceans (Southall *et al.* 2007) and PW pinniped (approximation).

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

For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information. Nine marine mammal species (six cetacean and three pinniped (all phocid species)) have the reasonable potential to co-occur with the proposed activities. Please refer to Table 2. Of the cetacean species that may be present, three are classified as low-frequency cetaceans (*i.e.,* all mysticete species), two are classified as mid-frequency cetaceans (*i.e.,* all delphinid species), and one is classified as a high-frequency cetacean (*i.e.,* harbor porpoise).

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

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

Description of Sound Sources

This section contains a brief technical background on sound, on the characteristics of certain sound types, and on metrics used in this proposal inasmuch as the information is relevant to the specified activity and to a discussion of the potential effects of the specified activity on marine mammals found later in this document. For general information on sound and its interaction with the marine environment, please see, *e.g.,* Au and Hastings (2008); Richardson *et al.* (1995); Urick (1983).

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 hertz (Hz) or cycles per second. Wavelength is the distance between two peaks or corresponding points of a sound wave (length of one cycle). Higher frequency sounds have shorter wavelengths than lower frequency sounds, and typically attenuate (decrease) more rapidly, except in certain cases in shallower water. Amplitude is the height of the sound pressure wave or the ''loudness'' of a sound and is typically described using the relative unit of the decibel (dB). A sound pressure level (SPL) in dB is described as the ratio between a measured pressure and a reference pressure (for underwater sound, this is 1 microPascal (μPa)), and is a logarithmic unit that accounts for large variations in amplitude; therefore, a relatively small change in dB corresponds to large changes in sound pressure. The source level (SL) represents the SPL referenced at a distance of 1 m from the source (referenced to 1 μPa), while the received level is the SPL at the listener's position (referenced to 1 μPa).

Root mean square (rms) is the quadratic mean sound pressure over the duration of an impulse. Root mean square is calculated by squaring all of the sound amplitudes, averaging the squares, and then taking the square root of the average (Urick, 1983). Root mean square 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.

Sound exposure level (SEL; represented as dB re 1 μPa^2-s) represents the total energy in a stated frequency band over a stated time interval or event, and considers both intensity and duration of exposure. The per-pulse SEL is calculated over the time window containing the entire pulse (*i.e.,* 100 percent of the acoustic energy). SEL is a cumulative metric; it can be accumulated over a single pulse, or calculated over periods containing multiple pulses. Cumulative SEL represents the total energy accumulated by a receiver over a defined time window or during an event. Peak sound pressure (also referred to as zero-to-peak sound pressure or 0-pk) is the maximum instantaneous sound pressure measurable in the water at a specified distance from the source, and is represented in the same units as the rms sound pressure.

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 a manner similar to ripples on the surface of a pond and may be either directed in a beam or beams or may radiate in all directions (omnidirectional sources), as is the case for sound produced by the pile driving activity considered here. 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, which is defined as environmental background sound levels lacking a single source or point (Richardson *et al.,* 1995). 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.,* wind and waves, earthquakes, ice, atmospheric sound), biological (*e.g.,* sounds produced by marine mammals, fish, and invertebrates), and anthropogenic (*e.g.,* vessels, dredging, construction) sound. A number of sources contribute to ambient sound, including wind and waves, which are a main source of naturally occurring ambient sound for frequencies between 200 hertz (Hz) and 50 kilohertz (kHz) (Mitson, 1995). In general, ambient sound levels tend to increase with increasing wind speed and wave height. Precipitation can become an important component of total sound at frequencies above 500 Hz, and possibly down to 100 Hz during quiet times. Marine mammals can contribute significantly to ambient sound levels, as can some fish and snapping shrimp. The frequency band for biological contributions is from approximately 12 Hz to over 100 kHz. Sources of ambient sound related to human activity include transportation (surface vessels), dredging and construction, oil and gas drilling and production, geophysical surveys, sonar, and explosions. Vessel noise typically dominates the total ambient sound 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.

The sum of the various natural and anthropogenic sound sources that comprise ambient sound at any given location and time depends not only on the source levels (as determined by current weather conditions and levels of biological and human 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 decibels (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. Underwater ambient sound in Raritan Bay and the New York Bight is comprised of sounds produced by a number of natural and anthropogenic sources. Human-generated sound is a significant contributor to the ambient acoustic environment in the project location. Details of source types are described in the following text.

Sounds are often considered to fall into one of two general types: Pulsed and non-pulsed (defined in the following). The distinction between these two sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (*e.g.,* Ward, 1997 in Southall *et al.,* 2007). Please see Southall *et al.* (2007) for an in-depth discussion of these concepts. The distinction between these two sound types is not always obvious, as certain signals share properties of both pulsed and non-pulsed sounds. A signal near a source could be categorized as a pulse, but due to propagation effects as it moves farther from the source, the signal duration becomes longer (*e.g.,* Greene and Richardson, 1988).

Pulsed sound sources (*e.g.,* airguns, 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, 2005; Harris, 1998; NIOSH, 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 intermittent (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 or dredging, vibratory pile driving, and active sonar systems. The duration of such sounds, as received at a distance, can be greatly extended in a highly reverberant environment.

The impulsive sound generated by impact hammers is characterized by rapid rise times and high peak levels. Vibratory hammers produce non-impulsive, continuous noise at levels significantly lower than those produced by impact hammers. Rise time is slower, reducing the probability and severity of injury, and sound energy is distributed over a greater amount of time (*e.g.,* Nedwell and Edwards, 2002; Carlson *et al.,* 2005).

Acoustic Effects

We previously provided general background information on marine mammal hearing (see ''Description of Marine Mammals in the Area of the Specified Activity''). Here, we discuss the potential effects of sound on marine mammals.

Potential Effects of Underwater Sound—Note that, in the following discussion, we refer in many cases to a review article concerning studies of noise-induced hearing loss conducted from 1996–2015 (*i.e.,* Finneran, 2015). For study-specific citations, please see that work. 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; Götz *et al.,* 2009). The degree of effect is intrinsically related to the signal characteristics, received level, distance from the source, and duration of the sound exposure. In general, sudden, high level sounds can cause hearing loss, as can longer exposures to lower level sounds. Temporary or permanent loss of hearing will occur almost exclusively for noise within an animal's hearing range. We first describe specific manifestations of acoustic effects before providing discussion specific to pile driving.

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

We describe the more severe effects (*i.e.,* certain non-auditory physical or physiological effects) only briefly as we do not expect that there is a reasonable likelihood that pile driving may result in such effects (see below for further discussion). Potential effects from impulsive sound sources can range in severity from effects such as behavioral disturbance or tactile perception to physical discomfort, slight injury of the internal organs and the auditory system, or mortality (Yelverton *et al.,* 1973). Non-auditory physiological effects or injuries that theoretically might occur in marine mammals exposed to high level underwater sound or as a secondary effect of extreme behavioral reactions (*e.g.,* change in dive profile as a result of an avoidance reaction) caused by exposure to sound include neurological effects, bubble formation, resonance effects, and other types of organ or tissue damage (Cox *et al.,* 2006; Southall *et al.,* 2007; Zimmer and Tyack, 2007; Tal *et al.,* 2015). The construction activities considered here do not involve the use of devices such as explosives or mid-frequency tactical sonar that are associated with these types of effects.

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 (Finneran, 2015). 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, and there is no PTS data for cetaceans, but such relationships are assumed to be similar to those in humans and other terrestrial mammals. PTS typically occurs at exposure levels at least several decibels 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 6 dB higher than the TTS threshold on a peak-pressure basis and PTS cumulative sound exposure level thresholds are 15 to 20 dB higher than TTS cumulative sound exposure level thresholds (Southall *et al.,* 2007). Given the higher level of sound or longer exposure duration necessary to cause PTS as compared with TTS, it is considerably less likely that PTS could occur.

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

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

Currently, TTS data only exist for four species of cetaceans (bottlenose dolphin, beluga whale (*Delphinapterus leucas*), harbor porpoise, and Yangtze finless porpoise (*Neophocoena asiaeorientalis*)) and three species of pinnipeds (northern elephant seal (*Mirounga angustirostris*), harbor seal, and California sea lion (*Zalophus californianus*)) exposed to a limited number of sound sources (*i.e.,* mostly tones and octave-band noise) in laboratory settings (Finneran, 2015). TTS was not observed in trained spotted (*Phoca largha*) and ringed (*Pusa hispida*) seals exposed to impulsive noise at levels matching previous predictions of TTS onset (Reichmuth *et al.,* 2016). In general, harbor seals and harbor porpoises have a lower TTS onset than other measured pinniped or cetacean species (Finneran, 2015). 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), Finneran (2015), and NMFS (2018).

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 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). However, many delphinids approach low-frequency airgun source vessels with no apparent discomfort or obvious behavioral change (*e.g.,* Barkaszi *et al.,* 2012), indicating the importance of frequency output in relation to the species' hearing sensitivity.

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

Changes in dive behavior can vary widely and may consist of increased or decreased dive times and surface intervals as well as changes in the rates of ascent and descent during a dive (*e.g.,* Frankel and Clark, 2000; Costa *et al.,* 2003; Ng and Leung, 2003; Nowacek *et al.;* 2004; Goldbogen *et al.,* 2013a, 2013b). 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, 2005, 2006; Gailey *et al.,* 2007; Gailey *et al.,* 2016).

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.,* 2007). In some cases, animals may cease sound production during production of aversive signals (Bowles *et al.,* 1994).

Avoidance is the displacement of an individual from an area or migration path 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 airgun surveys (Malme *et al.,* 1984). Avoidance may be short-term, with animals returning to the area once the noise has ceased (*e.g.,* Bowles *et al.,* 1994; Goold, 1996; Stone *et al.,* 2000; Morton and Symonds, 2002; Gailey *et al.,* 2007). Longer-term displacement is possible, however, which may lead to changes in abundance or distribution patterns of the affected species in the affected region if habituation to the presence of the sound does not occur (*e.g.,* Blackwell *et al.,* 2004; Bejder *et al.,* 2006; Teilmann *et al.,* 2006).

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

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

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

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

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

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

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

Auditory Masking—Sound can disrupt behavior through masking, or interfering with, an animal's ability to detect, recognize, or discriminate between acoustic signals of interest (*e.g.,* those used for intraspecific communication and social interactions, prey detection, predator avoidance, navigation) (Richardson *et al.,* 1995; Erbe *et al.,* 2016). 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 if disrupting behavioral patterns. 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.,* 2007; 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.

Potential Effects of the Specified Activity—As described previously (see ''Description of Active Acoustic Sound Sources''), Transco proposes to conduct pile driving and pile removal. The effects of pile driving and removal on marine mammals are dependent on several factors, including the size, type, and depth of the animal; the depth, intensity, and duration of the pile driving sound; the depth of the water column; the substrate of the habitat; the distance between the pile and the animal; and the sound propagation properties of the environment.

Noise generated by impact pile driving consists of regular, pulsed sounds of short duration. These pulsed sounds are typically high energy with fast rise times. Exposure to these sounds may result in harassment depending on proximity to the sound source and a variety of environmental and biological conditions (Dahl et al. 2015; Nedwell et al., 2007). Illingworth & Rodkin (2007) measured an unattenuated sound pressure within 10 m (33 ft) at a peak of 220 dB re 1 μPa for a 2.4 m (96 in) steel pile driven by an impact hammer. Studies of underwater sound from pile driving finds that most of the acoustic energy is below one to two kHz, with broadband sound energy near the source (40 Hz to >40 kHz) and only low-frequency energy (<~400 Hz) at longer ranges (Bailey et al., 2010; Erbe, 2009; Illingworth & Rodkin, 2007). There is typically a decrease in sound pressure and an increase in pulse duration the greater the distance from the noise source (Bailey et al., 2010). Maximum noise levels from pile driving usually occur during the last stage of driving each pile where the highest hammer energy levels are used (Betke, 2008).

The onset of behavioral disturbance from anthropogenic sound depends on both external factors (characteristics of sound sources and their paths) and the specific characteristics of the receiving animals (hearing, motivation, experience, demography) and is difficult to predict (Southall *et al.,* 2007). It is possible that the onset of pile driving could result in temporary, short-term changes in an animal's typical behavioral patterns and/or temporary avoidance of the affected area. These behavioral changes may include (Richardson *et al.,* 1995): Changing durations of surfacing and dives, number of blows per surfacing, or moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping); avoidance of areas where sound sources are located; and/or flight responses. The biological significance of many of these behavioral disturbances is difficult to predict, especially if the detected disturbances appear minor. However, the consequences of behavioral modification could be expected to be biologically significant if the change affects growth, survival, or reproduction. Significant behavioral modifications that could lead to effects on growth, survival, or reproduction, such as drastic changes in diving/surfacing patterns or significant habitat abandonment are considered extremely unlikely in the case of the proposed project, as it is expected that mitigation measures, including clearance zones and soft start (described in detail below, see ''Proposed Mitigation Measures'') will minimize the potential for marine mammals to be exposed to sound levels that would result in more extreme behavioral responses. In addition, marine mammals in the project area are expected to avoid any area that would be ensonified at sound levels high enough for the potential to result in more severe acute behavioral responses, as the environment within Raritan Bay would allow marine mammals the ability to freely move to other areas of the Bay without restriction.

In the case of pile driving, sound sources would be active for relatively short durations, with relation to potential for masking. The frequencies output by pile driving activity are lower than those used by most species expected to be regularly present for communication or foraging. Those species who would be more susceptible to masking at these frequencies (LF cetaceans) use the area only seasonally. We expect insignificant impacts from masking, and 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 pile driving, and which have already been taken into account in the exposure analysis.

Anticipated Effects on Marine Mammal Habitat

The proposed activities would not result in permanent impacts to habitats used directly by marine mammals, but may have potential short-term impacts to food sources such as forage fish. The proposed activities could also affect acoustic habitat (see masking discussion above), but meaningful impacts are unlikely. There are no known foraging hotspots, or other ocean bottom structures of significant biological importance to marine mammals present in the project area. Therefore, the main impact issue associated with the proposed activity would be temporarily elevated sound levels and the associated direct effects on marine mammals, as discussed previously. The most likely impact to marine mammal habitat occurs from pile driving effects on likely marine mammal prey (*e.g.,* fish). Impacts to the immediate substrate during installation of piles are anticipated, but these would be limited to minor, temporary suspension of sediments, which could impact water quality and visibility for a short amount of time, without any expected effects on individual marine mammals. Impacts to substrate are therefore not discussed further.

Effects to Prey—Sound may affect marine mammals through impacts on the abundance, behavior, or distribution of prey species (*e.g.,* crustaceans, cephalopods, fish, zooplankton). Marine mammal prey varies by species, season, and location and, for some, is not well documented. Here, we describe studies regarding the effects of noise on known marine mammal prey.

Fish utilize the soundscape and components of sound in their environment to perform important functions such as foraging, predator avoidance, mating, and spawning (*e.g.,* Zelick *et al.,* 1999; Fay, 2009). Depending on their hearing anatomy and peripheral sensory structures, which vary among species, fishes hear sounds using pressure and particle motion sensitivity capabilities and detect the motion of surrounding water (Fay *et al.,* 2008). The potential effects of noise on fishes depends on the overlapping frequency range, distance from the sound source, water depth of exposure, and species-specific hearing sensitivity, anatomy, and physiology. Key impacts to fishes may include behavioral responses, hearing damage, barotrauma (pressure-related injuries), and mortality.

Fish react to sounds which are especially strong and/or intermittent low-frequency sounds, and behavioral responses such as flight or avoidance are the most likely effects. Short duration, sharp sounds can cause overt or subtle changes in fish behavior and local distribution. The reaction of fish to noise depends on the physiological state of the fish, past exposures, motivation (*e.g.,* feeding, spawning, migration), and other environmental factors. 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). Several studies have demonstrated that impulse sounds might affect the distribution and behavior of some fishes, potentially impacting foraging opportunities or increasing energetic costs (*e.g.,* Fewtrell and McCauley, 2012; Pearson *et al.,* 1992; Skalski *et al.,* 1992; Santulli *et al.,* 1999; Paxton *et al.,* 2017). However, some studies have shown no or slight reaction to impulse sounds (*e.g.,* Pena *et al.,* 2013; Wardle *et al.,* 2001; Jorgenson and Gyselman, 2009; Cott *et al.,* 2012). More commonly, though, the impacts of noise on fish are temporary.

SPLs of sufficient strength have been known to cause injury to fish and fish mortality. However, in most fish species, hair cells in the ear continuously regenerate and loss of auditory function likely is restored when damaged cells are replaced with new cells. Halvorsen *et al.* (2012a) showed that a TTS of 4–6 dB was recoverable within 24 hours for one species. Impacts would be most severe when the individual fish is close to the source and when the duration of exposure is long. Injury caused by barotrauma can range from slight to severe and can cause death, and is most likely for fish with swim bladders. Barotrauma injuries have been documented during controlled exposure to impact pile driving (Halvorsen *et al.,* 2012b; Casper *et al.,* 2013).

The most likely impact to fish from pile driving activities in the project area would be temporary behavioral avoidance of the area. The duration of fish avoidance of an area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution and behavior is anticipated. In general, impacts to marine mammal prey species are expected to be minor and temporary due to the expected short daily duration of individual pile driving events and the relatively small areas being affected.

The area likely impacted by the activities is relatively small compared to the available habitat in Raritan Bay. Any behavioral avoidance by fish of the disturbed area would still leave significantly large areas of fish and marine mammal foraging habitat in the nearby vicinity. Based on the information discussed herein, we conclude that impacts of the specified activity are not likely to have more than short-term adverse effects on any prey habitat or populations of prey species. Further, any impacts to marine mammal habitat are not expected to result in significant or long-term consequences for individual marine mammals, or to contribute to adverse impacts on their populations. Effects to habitat will not be discussed further in this document.

Estimated Take

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

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines ''harassment'' as any act of pursuit, torment, or annoyance, which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes would primarily be by Level B harassment, as noise from pile driving has the potential to result in disruption of behavioral patterns for individual marine mammals. There is also some potential for auditory injury (Level A harassment) to result. The proposed mitigation and monitoring measures are expected to minimize the severity of such taking to the extent practicable. 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.

Generally speaking, we estimate take by considering: (1) Acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) and the number of days of activities. We note that while these basic factors can contribute to a basic calculation to provide an initial prediction of takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.,* previous monitoring results or average group size). Below, we describe the factors considered here 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—Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.,* frequency, predictability, duty cycle), the environment (*e.g.,* bathymetry), and the receiving animals (hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Southall *et al.,* 2007, Ellison *et al.,* 2012). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 160 dB re 1 μPa (rms) for impulsive and/or intermittent sources (*e.g.,* impact pile driving) and 120 dB rms for continuous sources (*e.g.,* vibratory driving). Transco's proposed activity includes the use of intermittent sources (impact pile driving) and continuous sources (vibratory driving), therefore use of the 120 and 160 dB re 1 μPa (rms) thresholds are applicable.

Level A harassment—NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on

Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). The components of Transco's proposed activity that may result in the take of marine mammals include the use of impulsive and non-impulsive sources.

These thresholds are provided in Table 4 below. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2018 Technical Guidance, which may be accessed at: *www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance.*

TABLE 4—THRESHOLDS IDENTIFYING THE ONSET OF PERMANENT THRESHOLD SHIFT

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

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

Note: Peak sound pressure (L_{pk}) has a reference value of 1 μPa, and cumulative sound exposure level (L_E) has a reference value of 1μPa²s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript "flat" is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (*i.e.,* varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

Ensonified Area

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

Sound Propagation—Transmission loss (TL) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for underwater TL is:

$$TL = B * \log_{10}(R_1/R_2),$$

Where

B = transmission loss coefficient (assumed to be 15)

R_1 = the distance of the modeled SPL from the driven pile, and

R_2 = the distance from the driven pile of the initial measurement.

This formula neglects loss due to scattering and absorption, which is assumed to be zero here. The degree to which underwater sound propagates away from a sound source is dependent on a variety of factors, most notably the water bathymetry and presence or absence of reflective or absorptive conditions including in-water structures and sediments. Spherical spreading occurs in a perfectly unobstructed (free-field) environment not limited by depth or water surface, resulting in a 6 dB reduction in sound level for each doubling of distance from the source (20*log(range)). Cylindrical spreading occurs in an environment in which sound propagation is bounded by the water surface and sea bottom, resulting in a reduction of 3 dB in sound level for each doubling of distance from the source (10*log(range)). As is common practice in coastal waters, here we assume practical spreading loss (4.5 dB reduction in sound level for each doubling of distance). Practical spreading is a compromise that is often used under conditions where water depth increases as the receiver moves away from the shoreline, resulting in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions.

Sound Source Levels—The intensity of pile driving sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity takes place. Acoustic measurements of pile driving at the project area are not available. Therefore, to estimate sound levels associated with the proposed project, representative source levels for installation and removal of each pile type and size were identified using the compendium compiled by the California Department of Transportation (Caltrans, 2015). The information presented in Caltrans (2015) is a compilation of SPLs recorded during various in-water pile driving projects in California, Oregon, Washington, and Nebraska. The compendium is a commonly used reference document for pile driving source levels when analyzing potential impacts on protected species, including marine mammals, from pile driving activities.

The proposed project would include impact and vibratory installation and vibratory removal of 0.25-m (10-in), 0.61-m (24-in), 0.86-m (34-in), 0.91-m (36-in), 0.91- to 1.2-m (36- to 48-in), and 1.5-m (60-in)-diameter steel pipe piles. Reference source levels from Caltrans (2015) were determined using data for piles of similar sizes, the same pile driving method as that proposed for the project, and at similar water depths (Table 5). While the pile sizes and water depths chosen as proxies do not exactly match those for the proposed project, they represent the closest matches available. It is assumed that the source levels shown in Table 5 are the most representative for each pile type and associated pile driving method. To be conservative, the representative sound source levels were based on the largest pile expected to be driven/removed at each potential in-water construction site. For example, where Transco may use a range of pile sizes (*i.e.,* 0.91 to 1.2 m (36 to 48 in)), the largest potential pile size (1.2 m (48 in)) was used in the modeling.

TABLE 5—MODELED PILE INSTALLATION AND REMOVAL SOURCE LEVELS

Pile diameter (in)	RMS (dB)		SEL	
	Impact	Vibratory	Impact	Vibratory
Installation				
10	....	150	....	150
24	....	160	....	160
34	193	168	183	168
36	193	168	183	168
48	....	170	....	170
60	195	170	185	170
Removal				
10	....	150	....	150
24	....	160	....	160
34	....	168	....	168
36	....	168	....	168
48	....	170	....	170
60	....	170	....	170

Since there would be many piles at each of the construction sites within close proximately to one another, it was not practical to estimate zones of influence (ZOIs) for each individual pile, and results would have been nearly identical for all similarly sized piles at each construction location. In order to simplify calculations, a representative pile site was selected for eight separate pile locations (Table 6) (See Figure 8 in the IHA application for the representative locations).

TABLE 6—REPRESENTATIVE PILE SITES SELECTED FOR MODELING

Location/mile post (MP)	Pile size (inches)
HDD Morgan Offshore (MP 12.59)	24
	36
	48
Neptune Power Cable Crossing (MP 13.84)	10
MP 14.5 to MP 16.5	24
MP 28.0 to MP 29.36	34
HDD Ambrose West Side (MP 29.4)	24
	36
	48
	60
HDD Ambrose East Side (MP 30.48)	24
	36
	48
	60
MP 34.5 to MP 35.04	34
Neptune Power Cable Crossing (MP 35.04)	10

For strings where only a single pile type would be installed or removed (*i.e.,* Neptune Power Cable Crossing MP13.84 and MP35.04, MP14.5 to MP16.5, MP28.0 to MP29.36, and MP34.5 to MP35.04), the representative pile location was selected in the middle of the string. For the HDD Morgan Offshore string site, the location closest to the platform installation was selected as the representative pile location as it represents the area with the largest pile sizes. The HDD Ambrose West Side and HDD Ambrose East Side representative pile locations were selected based on the entry and exit pits. The HDD Ambrose East Side is the entry pit and the HDD Ambrose West Side is the exit pit. This would also represent the outer limit of the HDD Ambrose string, and is therefore the most conservative modeling option.

Distances to isopleths associated with Level A and Level B harassment thresholds were calculated for each pile size, for vibratory and impact installation and removal activities, at the representative pile locations (Table 6). When the NMFS Technical Guidance (2016) was published, in recognition of the fact that ensonified area/volume could be more technically challenging to predict because of the duration component in the new thresholds, we developed a User Spreadsheet that includes tools to help predict a simple isopleth that can be used in conjunction with marine mammal density or occurrence to help predict takes. We note that because of some of the assumptions included in the methods used for these tools, we anticipate that isopleths produced are typically going to be overestimates of some degree, which may result in some degree of overestimate of Level A harassment 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 such as pile driving from the proposed project the NMFS Optional User Spreadsheet predicts the closest distance at which, if a marine mammal remained at that distance the whole duration of the activity, it would incur PTS. Inputs used in the Optional User Spreadsheet, and the resulting isopleths, are reported below. The ''Impact Pile Driving'' and ''Non-Impulse-stationary-continuous'' tabs of the Optional User Spreadsheet were used to calculate isopleth distances to the Level A harassment thresholds for impact and vibratory driving, respectively.

The updated acoustic thresholds for impulsive sounds (such as pile driving) contained in the Technical Guidance (NMFS, 2018) were presented as dual metric acoustic thresholds using both SEL_{cum} and peak sound pressure level metrics. As dual metrics, NMFS considers onset of PTS (Level A harassment) to have occurred when either one of the two metrics is exceeded (*i.e.,* metric resulting in the largest isopleth). The SEL_{cum} metric considers both level and duration of exposure, as well as auditory weighting functions by marine mammal hearing group. Isopleth distances to relevant Level A harassment thresholds were calculated, for both the SEL_{cum} and peak sound pressure level metrics, for all pile sizes at the representative pile driving locations as described above. The largest modeled isopleth distance to harassment thresholds based on the peak SPL metric was 34.1 m which was modeled based on 60 inch piles for the high frequency functional hearing group (threshold of 202 dB re 1 μPa; Table 4). Calculation of isopleth distances to relevant Level A harassment thresholds for all pile sizes and all marine mammal functional hearing groups resulted in greater modeled distances associated with the SEL_{cum} metric than the peak sound pressure level metric, thus the modeled distances associated with the SEL_{cum} metric were carried forward in the exposure analysis to be conservative. It should be noted that this method likely results in a conservative estimate of Level A exposures because the SEL_{cum} metric assumes continuous exposure to the total duration of pile driving anticipated for a given day, which represents an unlikely scenario given that there is likely both some temporal and spatial separation between pile driving operations within a day (when multiple piles are driven), and that marine mammals are mobile and would be expected to move away from a sound source before it reached a level that would have the potential to result in auditory injury. Inputs to the Optional User Spreadsheet are shown in Tables 7 and 8. The resulting isopleth distances to Level A harassment thresholds are shown in Tables 9 and 10.

TABLE 7—INPUTS TO NMFS OPTIONAL USER SPREADSHEET (NMFS, 2018) TO CALCULATE ISOPLETH DISTANCES TO LEVEL A HARASSMENT THRESHOLDS FOR VIBRATORY DRIVING AND REMOVAL

Pile size (representative pile location)	Source level (RMS SPL)	Pile driving duration (hours) within 24-hour period	Pile removal duration (hours) within 24-hour period	Weighting factor adjustment (kHz)	Propagation (xLogR)	Distance of source level measurement (m)
10 in. (Neptune Power Cable Crossing MP 13.84)	150	1.0	1.0	2.5	15	10
10 in. (Neptune Power Cable Crossing MP 35.04)	150	0.5	0.5	2.5	15	10
24 in. (Ambrose East MP 30.48)	160	1.25	5.5	2.5	15	10
24 in. (Ambrose West MP 29.4)	160	1.5	0.5	2.5	15	10
24 in. (Morgan Offshore MP 12.59)	160	1.0	0.3	2.5	15	10
24 in. (MP 14.5)	160	1.25	2.75	2.5	15	10
36 in. (Morgan Offshore MP 12.59)	168	1.0	4	2.5	15	10
36 in. (Ambrose East MP 30.48)	168	0.75	0.75	2.5	15	10
36 in. (Ambrose West MP 29.4)	168	0.5	0.75	2.5	15	10
48 in. (Ambrose East MP 30.48)	170	2.0	2.0	2.5	15	10
48 in. (Ambrose West MP 29.4)	170	1.0	2.0	2.5	15	10
48 in. (Morgan Offshore MP 12.59)	170	1.0	0.75	2.5	15	10
60 in. (Ambrose East MP 30.48)	170	0.25	0.25	2.5	15	10
60 in. (Ambrose West MP 29.4)	170	0.5	4.0	2.5	15	10

Note: Tab A (''Non Impulsive Static Continuous'') in the NMFS Optional User Spreadsheet (NMFS, 2018) was used for all calculations for vibratory installation of piles.

TABLE 8—INPUTS TO NMFS OPTIONAL USER SPREADSHEET (NMFS, 2018) TO CALCULATE ISOPLETH DISTANCES TO LEVEL A HARASSMENT THRESHOLDS FOR IMPACT DRIVING

Pile size (representative pile location)	Source level (RMS SPL)	Number of strikes per pile	Number of piles per day	Weighting factor adjustment (kHz)	Propagation (xLogR)	Distance of source level measurement (m)
36 in. (Morgan Offshore MP 12.59)	183	2,500	* 2/4	2	15	10
60 in. (Ambrose West	185	3,382	2	2	15	10

* The number of piles driven per day will vary based on the construction schedule, thus both scenarios (*i.e.,* 2 and 4 piles driven per day) were modeled.

Note: Tab E1 (''Impact Pile Driving'') in the NMFS Optional User Spreadsheet (NMFS, 2018) was used for all calculations for impact pile driving.

NMFS has established Level B harassment thresholds of 160 dB re1μPa (rms) for impulsive sounds (*e.g.,* impact pile driving) and 120 dB re1μPa (rms) for non-impulsive sounds (*e.g.,* vibratory driving and removal). Based on the predicted source levels associated with various pile sizes (Table 5) the distances from the pile driving/removal equipment to the Level B harassment thresholds were calculated, using the distance to the 160 dB threshold for the diesel impact hammer and the distance to the 120 dB threshold for the vibratory device, at the representative pile locations (Table 6). It should be noted that while sound levels associated with the Level B harassment threshold for vibratory driving/removal were estimated to propagate as far as 21,544 m (13 mi) from pile installation and removal activities based on modeling, it is likely that the noise produced from vibratory activities associated with the project would be masked by background noise before reaching this distance, as the Port of New York and New Jersey, which represents the busiest port on the east coast of the United States and the third busiest port in the United States, is located near the project area and sounds from the port and from vessel traffic propagate throughout the project area. However, take estimates conservatively assume propagation of project-related noise to the full extent of the modeled isopleth distance to the Level B harassment threshold. The modeled distances to isopleths associated with Level B harassment thresholds for impact and vibratory driving are shown in Tables 9 and 10.

TABLE 9—MODELED ISOPLETH DISTANCES TO LEVEL A AND LEVEL B HARASSMENT THRESHOLDS FOR IMPACT AND VIBRATORY PILE INSTALLATION

			Low-frequency cetaceans	Mid-frequency cetaceans	High-frequency cetaceans	Phocid seals	Cetaceans and phocids
Impulsive			183 dB	185 dB	155 dB	185 dB	160 dB
Non-Impulsive			199 dB	198 dB	173 dB	201 dB	120 dB
Location/mile post (MP)	Pile size (inches)	Hammer type	Distance to Level A harassment threshold (m) *				Distance to Level B harassment threshold (m)
HDD Morgan Offshore (MP 12.59)	24	Vibratory	5.9	0.5	8.7	3.6	4,641.6
	36	Vibratory	20.0	1.8	29.6	12.2	15,848.9
		Impact	4,635.2	164.9	5,521.3	2,480.6	1,584.9
	48	Vibratory	27.2	2.4	40.2	16.5	21,544.3
Neptune Power Cable Crossing (MP 13.84).	10	Vibratory	1.3	0.1	1.9	0.8	1,000.0
MP 14.5 to MP 16.5	24	Vibratory	6.8	0.6	10.1	4.1	4,641.6
MP 28.0 to MP 29.36	34	Vibratory	20.0	1.8	29.6	12.2	15,848.9
HDD Ambrose West Side (MP 29.4)	24	Vibratory	7.7	0.7	11.3	4.7	4,641.6
	36	Vibratory	12.6	1.1	18.6	7.7	15,848.9
	48	Vibratory	27.2	2.4	40.2	16.5	21,544.3
	60	Vibratory	17.1	1.5	25.3	10.4	21,544.3
		Impact	4,855.2	172.7	5,783.3	2,598.3	2,154.4
HDD Ambrose East Side (MP 30.48)	24	Vibratory	6.8	0.6	10.1	4.1	4,641.6
	36	Vibratory	16.5	1.5	24.4	10.0	15,848.9
	48	Vibratory	43.2	3.8	63.8	26.2	21,544.3
	60	Vibratory	10.8	1.0	16.0	6.6	21,544.3
MP 34.5 to MP 35.04	34	Vibratory	12.6	1.1	18.6	7.7	15,848.9
		Impact	2,920.0	103.9	3,478.2	1,562.7	1,584.9
Neptune Power Cable Crossing (MP 35.04).	10	Vibratory	0.8	0.1	1.2	0.5	1,000.0

* All distances shown are based on the SELcum metric. Distances to the peak SPL metric for impact driving were smaller than those for the SELcum metric for all pile sizes and scenarios.

TABLE 10—MODELED ISOPLETH DISTANCES TO LEVEL A AND LEVEL B HARASSMENT THRESHOLDS FOR VIBRATORY PILE REMOVAL

			Low-frequency cetaceans	Mid-frequency cetaceans	High-frequency cetaceans	Phocid seals	Cetaceans and phocids
Non-Impulsive			199 dB	198 dB	173 dB	201 dB	120 dB
Location/mile post (MP)	Pile size (inches)	Hammer type	Distance to Level A harassment threshold (m)				Distance to Level B harassment threshold (m)
HDD Morgan Offshore (MP 12.59)	24	Vibratory	2.6	0.2	3.9	1.6	4,641.6
	36	Vibratory	50.4	4.5	74.5	30.6	15,848.9
	48	Vibratory	22.4	2.0	33.2	13.6	21,544.3
Neptune Power Cable Crossing (MP 13.84).	10	Vibratory	1.3	0.1	1.9	0.8	1,000.0
MP 14.5 to MP 16.5	24	Vibratory	11.5	1.0	17.0	7.0	4,641.6
MP 28.0 to MP 29.36	34	Vibratory	41.6	3.7	61.5	25.3	15,848.9
HDD Ambrose West Side (MP 29.4)	24	Vibratory	3.7	0.3	5.5	2.2	4,641.6
	36	Vibratory	16.5	1.5	24.4	10.0	15,848.9
	48	Vibratory	43.2	3.8	63.8	26.2	21,544.3
	60	Vibratory	68.5	6.1	101.3	41.6	21,544.3
HDD Ambrose East Side (MP 30.48)	24	Vibratory	18.3	1.6	27.0	11.1	4,641.6
	36	Vibratory	16.5	1.5	24.4	10.0	15,848.9
	48	Vibratory	43.2	3.8	63.8	26.2	21,544.3
	60	Vibratory	10.8	1.0	16.0	6.6	21,544.3
MP 34.5 to MP 35.04	34	Vibratory	12.6	1.1	18.6	7.7	15,848.9
Neptune Power Cable Crossing (MP 35.04).	10	Vibratory	0.8	0.1	1.2	0.5	1,000.0

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.

There are no marine mammal density estimates for Raritan Bay. The best available information regarding marine mammal densities in the project area is provided by habitat-based density models produced by the Duke University Marine Geospatial Ecology Laboratory (Roberts *et al.,* 2016, 2017, 2018). These density models were originally developed for all cetacean taxa in the U.S. Atlantic (Roberts et al., 2016); more information, including the model results and supplementary information for each model, is available at *seamap.env.duke.edu/models/Duke-EC-GOM-2015/.* In subsequent years, certain models have been updated on the basis of additional data as well as certain methodological improvements. Although these updated models (and a newly developed seal density model) are not currently publicly available, our evaluation of the changes leads to a conclusion that these represent the best scientific evidence available. Marine mammal density estimates in the project area (animals/km^2) were obtained using these model results (Roberts *et al.,* 2016, 2017, 2018). As noted, the updated models incorporate additional sighting data, including sightings from the NOAA Atlantic Marine Assessment Program for Protected Species (AMAPPS) surveys from 2010–2014 (NEFSC & SEFSC, 2011b, 2012, 2014a, 2014b, 2015, 2016). For each cetacean species, density data for summer (June–August) and fall (September, October, November) were used to generate source grids by averaging monthly densities (see Figure 15 in the IHA application for an example of one such source grid). Since the source density grids do not extend to Raritan Bay, the grids were extrapolated to cover the bay and values were pulled from the nearest grid cell to assign density values to those empty cells in order to approximate densities in Raritan Bay (see Figure 16 in the IHA application). The resulting density grid was used to calculate take estimates of marine mammals for pile installation and removal activities. It should be noted that this approach likely results in conservative estimates of cetacean density for the project area, as cetacean densities in Raritan Bay are expected to be lower than the densities in the areas of the Atlantic Ocean from which the densities were extrapolated (with the exception of humpback whales, as described below).

For harbor seals and gray seals, densities were first obtained from Roberts et al. (2018), as described above for cetacean densities. However, because the pinniped data used in the Roberts et al. (2018) density models were derived from offshore aerial and vessel surveys, the models did not accurately represent the densities of pinnipeds that would be expected in Raritan Bay, as they underestimate densities that would be expected closer to shore which would be higher than those offshore due to closer proximity to haulouts. Thus, the extrapolation of pinniped densities from Roberts et al. (2018) to Raritan Bay resulted in exposure estimates that were not consistent with expectations of actual pinniped densities based on the number of opportunistic sightings reported in the project area. There have been no systematic studies focusing on seal populations within Raritan Bay, Lower New York Bay, or Sandy Hook Bay. Therefore, pinniped densities were estimated using systematic data collected by Coastal Research and Education Society of Long Island, Inc. (CRESLI) from November 18, 2018, to April 16, 2019, at Cupsogue Beach Park in Westhampton Beach, NY (CRESLI, 2019).

Take Calculation and Estimation

Here we describe how the information provided above is brought together to produce a quantitative take estimate. The following steps were performed to estimate the potential numbers of marine mammal exposures above Level A and Level B harassment thresholds as a result of the proposed activity:

1. Distances to isopleths corresponding to Level A and Level B harassment thresholds were calculated for each pile size for vibratory and impact installation and removal activities at the representative pile locations within the Project area, as described above.
2. GIS analysis was then used, incorporating these distance values and a viewshed analysis (described below), to calculate resulting ZOIs.
3. Species density estimations were incorporated in the GIS analysis to determine estimated number of daily exposures.
4. Daily exposure estimates were multiplied by the duration (days) of the corresponding in-water construction activity (based on pile size and location).

As described above, the distances to isopleths associated with Level A and Level B harassment thresholds were calculated for each pile size for vibratory and impact installation and removal activities (Tables 9 and 10). These distances to relevant thresholds were then incorporated into a GIS analysis to analyze the relevant ZOIs within which take of marine mammals would be expected to occur. Given that the proposed activity would occur in a semi-enclosed bay, the modeled distances to thresholds would in some cases be truncated by land (*i.e.,* the sounds from the proposed activity would not propagate to the full modeled isopleth distances because of the presence of land, which in some cases is closer to the pile driving/removal location than the total distances). A viewshed analysis is a standard technique used in GIS to determine whether an area is visible from a specific location (Kim et al., 2004). The analysis uses an elevation value of two points with direct line of sight to determine the likelihood of seeing the elevated point from the ground. Incorporating the viewshed analysis allowed GIS modeling of sound propagation to replicate how sound waves traveling through the water are truncated when they encounter land. GIS modeling used an artificial elevation model setting the water to zero (ground) and any land mass to 100 (elevated point) and focusing only on areas within the Project area where sound would propagate. Any land within direct 'line of sight' to the sound source would prevent the sound from propagating farther. This method was applied to each of the eight representative pile locations. This simple model does not account for diffusion, which would be minimal with large landmasses; therefore in the model no sound bends around landmasses. See Figure 9 in the IHA application for an example of applying the viewshed analysis to a single representative pile location (HDD Morgan Offshore).

A custom Python script was developed to calculate potential cetacean takes due to pile installation and removal activities. The script overlays the species-specific Level A and Level B harassment ZOIs (each clipped by the viewshed) for each pile size and type at each of the representative pile locations (Table 6), over the density grid cells. The script then multiplies the total density value by the area of the ZOI, resulting in initial take estimate outputs. The following formulas were implemented by the script for each species at each representative pile location:

Initial Level A take estimate = ZOI * d
Initial Level B take estimate = ZOI * d

Where:

ZOI = the ensonified area at or above the species-specific acoustic threshold, clipped by the viewshed.
d = density estimate for each species within the ZOI.

The initial take estimates were then multiplied by the duration (days) of the corresponding in-water construction activity (based on pile size and location). The following formulas demonstrate this method:

Level A take estimate = initial take estimate * X days of activity
Level B take estimate = initial take estimate * X days of activity

Where:

X days of activity = number of days for which the corresponding in-water construction activity occurs.

These numbers were then totaled to provide estimates of the numbers of take by Level A and Level B harassment for each species. The exposure numbers were rounded to the nearest whole individual. As the construction schedule has not yet been finalized, the take calculations described above were performed for two scenarios: (1) All construction activities occurring during summer 2020, and (2) installation occurring during the summer and removal in fall of 2020. To be conservative, the higher take estimates calculated between the two scenarios were then carried forward in the analysis.

Note that for bottlenose dolphins, the density data presented by Roberts et al. (2016) does not differentiate between bottlenose dolphin stocks. Thus, the take estimate for bottlenose dolphins calculated by the method described above resulted in an estimate of the total of bottlenose dolphins expected to be taken, from all stocks (for a total of 6,331 takes by Level B harassment). However, as described above, both the Western North Atlantic Northern Migratory Coastal stock and the Western North Atlantic Offshore stock have the potential to occur in the project area. As the project area represents the extreme northern extent of the known range of the Western North Atlantic Northern Migratory Coastal stock, and as dolphins from the Western North Atlantic Northern Migratory Coastal stock have never been documented in Raritan Bay, we assume that 25 percent of bottlenose dolphins taken would be from the North Atlantic Northern Migratory Coastal stock and the remaining 75 percent of bottlenose dolphins taken will be from the Western North Atlantic Offshore stock. Thus, we allocated 75 percent of the total proposed authorized bottlenose dolphin takes to the Western North Atlantic Offshore stock (total 4,748 takes by Level B harassment), and 25 percent to the Western North Atlantic Northern Migratory Coastal stock (total 1,583 takes by Level B harassment) (Table 11).

For humpback whales and harbor, gray and harp seals, the methods used to estimate take were slightly different than the methodology described above. For humpback whales, the steps above resulted in zero exposures above the Level B harassment threshold. However, there are confirmed anecdotal sightings of humpback whales within or near the project area, indicating that potential exposures above the Level B harassment threshold may occur and therefore should be accounted for. As the exposure estimate method described above resulted in zero exposures, other methods for calculating take by Level B harassment were applied. Brown et al. (2018) reported 617 sightings of humpback whales within the New York Bight from 2011 to 2017. The total number of sightings was divided by the total number of years of surveys (n=6), and this number was then divided by 12 months, to estimate a mean number of whales per month. This number was then multiplied by a conservative number of months of pile driving and removal activities (n=4) to estimate the number of humpback whales that may be taken Level B harassment (Table 11).

As described above, local survey data represents the best available information on abundance estimates for pinnipeds in the project area. Estimates of take by Level B harassment for gray and harbor seals were calculated using systematic data collected by CRESLI from November 18, 2018, to April 16, 2019, where a total of 2,689 harbor seals were sighted at Cupsogue Beach Park. The total number of sightings was divided by the total number of survey months (n=5) to get a mean number of individual seals per month. This number was then multiplied by a conservative number of potential months of pile driving and removal activities (n=4) to estimate a total number of seals (2,151) expected to be taken over the duration of the proposed project. To estimate the potential number of gray seals and harbor seals that may be taken, the ratio of harbor seals (64 percent) versus gray seals (36 percent) was calculated based on available density data. The data presented by Roberts et al. (2018 does not differentiate by seal species. Thus the best available density information on the ratio of gray to harbor seals comes from the U.S. Navy's OPAREA Density Estimates (Halpin et al. 2009; Navy 2007, 2012). The ratio of gray to harbor seals in the OPAREA Density Estimates was therefore applied to the total number of seals estimated to be taken (n=2,151), to estimate the total number of gray and harbor seals expected to be taken during the duration of the proposed project. Based on this approach, we propose to authorize the incidental take of 1,377 harbor seals (2,151 * 0.64) and 774 gray seals (2,151 * 0.36).

To calculate estimates of take by Level A harassment for gray and harbor seals, a ratio of take by Level A harassment relative to take by Level B harassment was calculated using the NODES data. These estimates accounted for the spatial extent of potential exposure to noise that could result in Level A and B harassment since they were based on the ensonifed areas multiplied by the NODES densities. Therefore, an estimation of the potential exposure of pinnipeds to Level A harassment as a proportion of potential exposure of pinnipeds to Level B harassment was used to calculate a reasonable estimate of Level A harassment takes using the Level B harassment estimates. This ratio was 0.009 for harbor seals and 0.008 for gray seals; therefore, we propose to authorize the take by Level A harassment of 12 harbor seals (1,377 * 0.009) and 6 gray seals (774 * 0.008).

Due to lack of data and their rare occurrence in the Mid-Atlantic region, no densities for harp seals are available. However, harp seals have been documented along the southern coast of Long Island during the winter, and a recent pinniped UME has resulted in increased strandings of harp seals on the Atlantic coast. Because so few harp seals have been documented in the region of the project area, we estimate that up to four harp seals (the total number opportunistically observed at Cupsogue Beach (CRESLI, 2008) could enter the Level B harassment zone and be taken by Level B harassment. Take numbers proposed for authorization are shown in Table 11.

TABLE 11—TOTAL NUMBERS OF POTENTIAL INCIDENTAL TAKES OF MARINE MAMMALS PROPOSED FOR AUTHORIZATION AND PROPOSED TAKES AS A PERCENTAGE OF POPULATION

Species	Takes by Level A harassment proposed for authorization	Takes by Level B harassment proposed for authorization	Total takes proposed for authorization	Total takes proposed for authorization as a percentage of stock taken *
Fin whale	0	5	5	0.1
Humpback Whale	0	34	34	2.1
Minke Whale	0	1	1	0.0
North Atlantic Right Whale	0	2	2	0.5
Bottlenose Dolphin—Western North Atlantic Northern Migratory Coastal stock	0	1,583	1,583	23.8
Bottlenose Dolphin—Western North Atlantic Offshore stock	0	4,748	4,748	6.1
Common Dolphin	0	95	95	0.1
Harbor porpoise	0	11	11	0.0
Gray seal	6	774	780	2.9
Harbor seal	12	1,377	1,389	1.8
Harp seal	0	4	4	0.0

* Calculations of percentage of stock taken are based on the best available abundance estimate as shown in Table 2. For North Atlantic right whales the best available abundance estimate is derived from the 2018 North Atlantic Right Whale Consortium 2018 Annual Report Card (Pettis et al., 2018). For the pinniped species the best available abundance estimates are derived from the most recent NMFS Stock Assessment Reports. For all other species, the best available abundance estimates are derived from Roberts et al. (2016, 2017, 2018).

The take numbers we propose for authorization are considered conservative for the following reasons:

• Density estimates assume are largely derived from adjacent grid-cells that likely overestimate density in the vicinity of the project area.

• Proposed Level A harassment take numbers do not account for the likelihood that marine mammals will avoid a stimulus when possible before that stimulus reaches a level that would have the potential to result in injury; and

• Proposed Level A harassment take numbers do not account for the effectiveness of proposed mitigation and monitoring measures in reducing the number of takes.

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 and impact on operations.

The mitigation strategies described below are consistent with those required and successfully implemented under previous incidental take authorizations issued in association with in-water construction activities. Modeling was performed to estimate zones of influence (ZOI; see ''Estimated Take''); these ZOI values were used to inform mitigation measures for pile driving activities to minimize Level A harassment and Level B harassment to the extent possible, while providing estimates of the areas within which Level B harassment might occur.

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

Pre-Clearance Zones

Transco would use Protected Species Observers (PSOs) to establish pre-clearance zones around the pile driving equipment to ensure these zones are clear of marine mammals prior to the start of pile driving. The purpose of ''clearance'' of a particular zone is to prevent potential instances of auditory injury and potential instances of more severe behavioral disturbance as a result of exposure to pile driving noise (serious injury or death are unlikely outcomes even in the absence of mitigation measures) by delaying the activity before it begins if marine mammals are detected within certain pre-defined distances of the pile driving equipment. The primary goal in this case is to prevent auditory injury (Level A harassment), and the proposed pre-clearance zones are larger than the modeled distances to the isopleths corresponding to Level A harassment (based on peak SPL) for all marine mammal functional hearing groups. These zones vary depending on species and are shown in Table 12. All distances to pre-clearance zones are the radius from the center of the pile being driven.

TABLE 12—PROPOSED PRE-CLEARANCE ZONES DURING TRANSCO PILE DRIVING AND REMOVAL ACTIVITIES

Species	Clearance zone
North Atlantic right whale	Any distance.
Fin and humpback whale	1,000 m.
All other marine mammal species.	100 m.

If a marine mammal is observed approaching or entering the relevant pre-clearance zones prior to the start of pile driving operations, pile driving activity would be delayed until either the marine mammal has voluntarily left the respective clearance zone and been visually confirmed beyond that zone, or, 30 minutes have elapsed without re-detection of the animal.

Prior to the start of pile driving activity, the pre-clearance zones will be monitored for 30 minutes to ensure that they are clear of the relevant species of marine mammals. Pile driving would only commence once PSOs have declared the respective pre-clearance zones clear of marine mammals. Marine mammals observed within a pre-clearance zone will be allowed to remain in the pre-clearance zone (*i.e.,* must leave of their own volition), and their behavior will be monitored and documented. The pre-clearance zones (to a distance of 1,000 m) may only be declared clear, and pile driving started, when the entire pre-clearance zones are visible (*i.e.,* when not obscured by dark, rain, fog, etc.) for a full 30 minutes prior to pile driving.

Soft Start

The use of a soft start procedure is believed to provide additional protection to marine mammals by warning marine mammals or providing them with 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. Transco will utilize soft start techniques for impact pile driving by performing an initial set of three strikes from the impact hammer at a reduced energy level followed by a thirty second waiting period. The soft start process would be conducted a total of three times prior to driving each pile (*e.g.,* three strikes followed by a thirty second delay, then three additional single strikes followed by a thirty second delay, then a final set of three strikes followed by an additional thirty second delay). Soft start would be required at the beginning of each day's impact pile driving work and at any time following a cessation of impact pile driving of thirty minutes or longer.

Shutdown

The purpose of a shutdown is to prevent some undesirable outcome, such as auditory injury or behavioral disturbance of sensitive species, by halting the activity. If a marine mammal is observed entering or within the shutdown zones after pile driving has begun, the PSO will request a temporary cessation of pile driving. Transco has proposed that, when called for by a PSO, shutdown of pile driving would be implemented when feasible. However, if a shutdown is called for before a pile has been driven to a sufficient depth to allow for pile stability, then for safety reasons the pile would need to be driven to a sufficient depth to allow for stability and a shutdown would not be feasible until after that depth was reached. We therefore propose that shutdown would be implemented when feasible. If shutdown is called for by a PSO, and Transco determines a shutdown to be technically feasible, pile driving would be halted immediately. After shutdown, pile driving may be initiated once all clearance zones are clear of marine mammals for the minimum species-specific time periods, or, if required to maintain installation feasibility. For North Atlantic right whales, shutdown would occur when a right whale is observed by PSOs at any distance, and a shutdown zone of 85 m (279 ft) would be implemented for all other species (Table 13). The 500 m zone is proposed as a protective measure to avoid takes by Level A harassment, and potentially some takes by Level B harassment, of North Atlantic right whales. The 85 m zone was calculated based on the distance to the Level A harassment threshold based on the peak sound pressure metric (202 dB re 1μ Pa) for a 66-inch steel pile, plus an additional 50 m (164-ft) buffer.

TABLE 13—PROPOSED SHUTDOWN ZONES DURING TRANSCO PILE DRIVING AND REMOVAL ACTIVITIES

Species	Shutdown zone
North Atlantic right whale	Any distance.
All other marine mammal species.	85 m.

Visibility Requirements

All in-water construction and removal activities would be conducted during daylight hours, no earlier than 30 minutes after sunrise and no later than 30 minutes before sunset. Pile driving would not be initiated at night, or, when the full extent of all relevant clearance zones cannot be confirmed to be clear of marine mammals, as determined by the lead PSO on duty. The clearance zones may only be declared clear, and pile driving started, when the full extent of all clearance zones are visible (*i.e.,* when not obscured by dark, rain, fog, etc.) for a full 30 minutes prior to pile driving.

Monitoring Protocols

Monitoring would be conducted before, during, and after pile driving activities. In addition, observers will record all incidents of marine mammal occurrence, regardless of distance from the construction activity, and monitors will document any behavioral reactions in concert with distance from piles being driven. Observations made outside the shutdown zones will not result in delay of pile driving; that pile segment may be completed without cessation, unless the marine mammal approaches or enters the shutdown zone, at which point pile driving activities would be halted when practicable, as described above. Pile driving activities include the time to install a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than 30 minutes.

The following additional measures apply to visual monitoring:

(1) A minimum of two PSOs would be on duty at all times during pile driving and removal activity;

(2) Monitoring would be conducted by qualified, trained PSOs. One PSO would be stationed on the construction barge and one on an escort boat, during impact and vibratory pile installation and removal. The escort boat location would shift depending on work location, but will be a minimum of 100 to 200 m (328 to 656 ft) from the pile-driving location, depending on the site and the ensonification area associated with that specific pile-driving scenario;

(3) PSOs may not exceed four consecutive watch hours; must have a minimum two-hour break between watches; and may not exceed a combined watch schedule of more than 12 hours in a 24-hour period;

(4) Monitoring will be conducted from 30 minutes prior to commencement of pile driving, throughout the time required to drive a pile, and for 30 minutes following the conclusion of pile driving;

(5) PSOs will have no other construction-related tasks while conducting monitoring; and

(6) PSOs would have the following minimum qualifications:

• Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance; use of binoculars may be necessary to correctly identify the target;

• Ability to conduct field observations and collect data according to assigned protocols;

• Experience or training in the field identification of marine mammals, including the identification of behaviors;

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

• Writing skills sufficient to document 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 and times when in-water construction activities were suspended to avoid potential incidental injury of marine mammals from construction noise within a defined shutdown zone; and marine mammal behavior; and

• 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.

PSOs employed by Transco in satisfaction of the mitigation and monitoring requirements described herein must meet the following additional requirements:

• Independent observers (*i.e.,* not construction personnel) are required;

• At least one observer must have prior experience working as an observer;

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

• One observer will be designated as lead observer or monitoring coordinator. The lead observer must have prior experience working as an observer; and

• NMFS will require submission and approval of observer CVs.

Vessel Strike Avoidance

Vessel strike avoidance measures will include, but are not limited to, the following, except under circumstances when complying with these measures would put the safety of the vessel or crew at risk:

• All vessel operators and crew must maintain vigilant watch for cetaceans and pinnipeds, and slow down or stop their vessel to avoid striking these protected species;

• All vessels must travel at 10 knots (18.5 km/hr) or less within any designated Dynamic Management Area (DMA) for North Atlantic right whales;

• All vessels greater than or equal to 65 ft (19.8 m) in overall length will comply with 10 knot (18.5 km/hr) or less speed restriction in any Seasonal Management Area (SMA) for North Atlantic right whales per the NOAA ship strike reduction rule (73 FR 60173; October 10, 2008);

• All vessel operators will reduce vessel speed to 10 knots (18.5 km/hr) or less when any large whale, any mother/calf pairs, pods, or large assemblages of non-delphinoid cetaceans are observed near (within 100 m (330 ft)) an underway vessel;

• All survey vessels will maintain a separation distance of 500 m (1640 ft) or greater from any sighted North Atlantic right whale;

• If underway, vessels must steer a course away from any sighted North Atlantic right whale at 10 knots (18.5 km/hr) or less until the 500 m (1640 ft) minimum separation distance has been established. If a North Atlantic right whale is sighted in a vessel's path, or within 500 m (330 ft) to an underway vessel, the underway vessel must reduce speed and shift the engine to neutral. Engines will not be engaged until the right whale has moved outside of the vessel's path and beyond 500 m. If stationary, the vessel must not engage engines until the North Atlantic right whale has moved beyond 500 m;

• All vessels will maintain a separation distance of 100 m (330 ft) or greater from any sighted non-delphinoid cetacean. If sighted, the vessel underway must reduce speed and shift the engine to neutral, and must not engage the engines until the non-delphinoid cetacean has moved outside of the vessel's path and beyond 100 m. If a vessel is stationary, the vessel will not engage engines until the non-delphinoid cetacean has moved out of the vessel's path and beyond 100 m;

• All vessels will maintain a separation distance of 50 m (164 ft) or greater from any sighted delphinoid cetacean, with the exception of delphinoid cetaceans that voluntarily approach the vessel (*i.e.,* bow ride). Any vessel underway must remain parallel to a sighted delphinoid cetacean's course whenever possible, and avoid excessive speed or abrupt changes in direction. Any vessel underway must reduce vessel speed to 10 knots (18.5 km/hr) or less when pods (including mother/calf pairs) or large assemblages of delphinoid cetaceans are observed. Vessels may not adjust course and speed until the delphinoid cetaceans have moved beyond 50 m and/or the abeam of the underway vessel;

• All vessels will maintain a separation distance of 50 m (164 ft) or greater from any sighted pinniped; and

• All vessels underway will not divert or alter course in order to approach any whale, delphinoid cetacean, or pinniped. Any vessel underway will avoid excessive speed or abrupt changes in direction to avoid injury to the sighted cetacean or pinniped.

Transco will ensure that vessel operators and crew maintain a vigilant watch for marine mammals by slowing down or stopping the vessel to avoid striking marine mammals. Project-specific training will be conducted for all vessel crew prior to the start of the construction activities. Confirmation of the training and understanding of the requirements will be documented on a training course log sheet.

We have carefully evaluated Transco's proposed mitigation measures and considered a range of other measures in the context of ensuring that we prescribed the means of effecting the least practicable adverse impact on the affected marine mammal species and stocks and their habitat. Based on our evaluation of these measures, we have preliminarily determined that the proposed mitigation measures provide the means of effecting the least practicable adverse impact on marine mammal species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for subsistence uses.

Proposed Monitoring and Reporting

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

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

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

Visual Marine Mammal Observations

Transco will collect sighting data and behavioral responses to pile driving activity for marine mammal species observed in the region of activity during the period of activity. All observers will be trained in marine mammal identification and behaviors and are required to have no other construction-related tasks while conducting monitoring. PSOs would monitor all clearance zones at all times. PSOs would also monitor Level B harassment zones and would document any marine mammals observed within these zones, to the extent practicable (noting that some distances to these zones are too large to fully observe). Transco would conduct monitoring before, during, and after pile driving and removal, with observers located at the best practicable vantage points.

Transco would implement the following monitoring procedures:

- A minimum of two PSOs will maintain watch at all times when pile driving or removal is underway;
- PSOs would be located at the best possible vantage point(s) to ensure that they are able to observe the entire clearance zones and as much of the Level B harassment zone as possible;
- During all observation periods, PSOs will use binoculars and the naked eye to search continuously for marine mammals;
- If the clearance zones are obscured by fog or poor lighting conditions, pile driving will not be initiated until clearance zones are fully visible. Should such conditions arise while impact driving is underway, the activity would be halted when practicable, as described above; and
- The clearance zones will be monitored for the presence of marine mammals before, during, and after all pile driving activity.

Individuals implementing the monitoring protocol will assess its effectiveness using an adaptive approach. PSOs will use their best professional judgment throughout implementation and seek improvements to these methods when deemed appropriate. Any modifications to the protocol will be coordinated between NMFS and Transco.

Data Collection

We require that observers use standardized data forms. Among other pieces of information, Transco will record detailed information about any implementation of delays or shutdowns, including the distance of animals to the pile and a description of specific actions that ensued and resulting behavior of the animal, if any. We require that, at a minimum, the following information be collected on the sighting forms:

- Date and time that monitored activity begins or ends;
- Construction activities occurring during each observation period;
- Weather parameters (*e.g.,* wind speed, percent cloud cover, visibility);
- Water conditions (*e.g.,* sea state, tide state);
- Species, numbers, and, if possible, sex and age class of marine mammals;
- Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity;
- Distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
- Type of construction activity (*e.g.,* impact or vibratory driving/removal) when marine mammals are observed.
- Description of implementation of mitigation measures (*e.g.,* delay or shutdown).
- Locations of all marine mammal observations; and
- Other human activity in the area.

Transco would note behavioral observations, to the extent practicable, if an animal has remained in the area during construction activities.

Reporting

A draft report would be submitted to NMFS within 90 days of the completion of monitoring for each installation's in-water work window. The report would include marine mammal observations pre-activity, during-activity, and post-activity during pile driving days, and would also provide descriptions of any behavioral responses to construction activities by marine mammals. The report would detail the monitoring protocol, summarize the data recorded during monitoring including an estimate of the number of marine mammals that may have been harassed during the period of the report, and describe any mitigation actions taken (*i.e.,* delays or shutdowns due to detections of marine mammals, and documentation of when shutdowns were called for but not implemented and why). A final report must be submitted within 30 days following resolution of comments on the draft report.

Negligible Impact Analysis and Determination

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

Pile driving and removal activities associated with the proposed project, as described previously, have the potential to disturb or temporarily displace marine mammals. Specifically, the specified activities may result in take, in the form of Level A harassment (potential injury) or Level B harassment (potential behavioral disturbance) from underwater sounds generated from pile driving and removal. Potential takes could occur if individual marine mammals are present in the ensonified zone when pile driving and removal is occurring. To avoid repetition, the our analyses apply to all the species listed in Table 1, given that the anticipated effects of the proposed project on different marine mammal species and stocks are expected to be similar in nature.

Impact pile driving has source characteristics (short, sharp pulses with higher peak levels and sharper rise time to reach those peaks) that are potentially injurious or more likely to produce severe behavioral reactions. However, modeling indicates there is limited potential for injury even in the absence of the proposed mitigation measures, with most species predicted to experience no Level A harassment based on modeling results. In addition, the potential for injury is expected to be greatly minimized through implementation of the proposed mitigation measures including soft start and the implementation of clearance zones that would facilitate a delay of pile driving if marine mammals were observed approaching or within areas that could be ensonified above sound levels that could result in auditory injury. Given sufficient notice through use of soft start, marine mammals are expected to move away from a sound source that is annoying prior to its becoming potentially injurious or resulting in more severe behavioral reactions.

We expect that any exposures above the Level A harassment threshold would be in the form of slight PTS, *i.e.* minor degradation of hearing capabilities within regions of hearing that align most completely with the energy produced by pile driving (*i.e.* the low-frequency region below 2 kHz), not severe hearing impairment. If hearing impairment occurs, it is most likely that the affected animal would lose a few decibels in its hearing sensitivity, which in most cases is not likely to meaningfully affect its ability to forage and communicate with conspecifics. However, given sufficient notice through use of soft start, marine mammals are expected to move away from a sound source that is annoying prior to its becoming potentially injurious or resulting in more severe behavioral reactions.

Additionally, the numbers of exposures above the Level A harassment proposed for authorization are very low for all marine mammal stocks and species: For 9 of 11 stocks, we propose to authorize no takes by Level A harassment; for the remaining two stocks we propose to authorize no more than 12 takes by Level A harassment. As described above, we expect that marine mammals would be likely to move away from a sound source that represents an aversive stimulus, especially at levels that would be expected to result in PTS, given sufficient notice through use of soft start, thereby minimizing the degree of PTS that would be incurred. No serious injury or mortality of any marine mammal stocks are anticipated or proposed for authorization. Serious injury or mortality as a result of the proposed activities would not be expected even in the absence of the proposed mitigation and monitoring measures.

Repeated exposures of individuals to relatively low levels of sound outside of preferred habitat areas are unlikely to significantly disrupt critical behaviors. Thus, even repeated Level B harassment of some small subset of an overall stock is unlikely to result in any significant realized decrease in viability for the affected individuals, and thus would not result in any adverse impact to the stock as a whole. Instances of more severe behavioral harassment are expected to be minimized by proposed mitigation and monitoring measures. 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; HDR, Inc., 2012; Lerma, 2014). Most likely, individuals will simply move away from the sound source and temporarily avoid the area where pile driving is occurring. Therefore, we expect that animals disturbed by project sound would simply avoid the area during pile driving in favor of other, similar habitats. We expect that any avoidance of the project area by marine mammals would be temporary in nature and that any marine mammals that avoid the project area during construction activities would not be permanently displaced.

Feeding behavior is not likely to be significantly impacted, as prey species are mobile and are broadly distributed throughout the project area; therefore, marine mammals that may be temporarily displaced during construction activities are expected to be able to resume foraging once they have moved away from areas with disturbing levels of underwater noise. Because of the temporary nature of the disturbance and the availability of similar habitat and resources in the surrounding area, the impacts to marine mammals and the food sources that they utilize are not expected to cause significant or long-term consequences for individual marine mammals or their populations. There are no areas of notable biological significance for marine mammal feeding known to exist in the project area. In addition, there are no rookeries, mating areas, calving areas or migratory areas known to be biologically important to marine mammals within the proposed project area.

NMFS concludes that exposures to marine mammals due to the proposed project would result in only short-term effects to individuals exposed. Marine mammals may temporarily avoid the immediate area but are not expected to permanently abandon the area. Impacts to breeding, feeding, sheltering, resting, or migration are not expected, nor are shifts in habitat use, distribution, or foraging success. NMFS does not anticipate the marine mammal takes that would result from the proposed project would impact annual rates of recruitment or survival.

As described above, north Atlantic right, humpback, and minke whales, and gray, harbor and harp seals are experiencing ongoing UMEs. For North Atlantic right whales, as described above, no injury as a result of the proposed project is expected or proposed for authorization, and Level B harassment takes of right whales are expected to be in the form of avoidance of the immediate area of construction. In addition, the number of exposures above the Level B harassment threshold are minimal (*i.e.,* 2). As no injury or mortality is expected or proposed for authorization, and Level B harassment of North Atlantic right whales will be reduced to the level of least practicable adverse impact through use of proposed mitigation measures, the proposed authorized takes of right whales would not exacerbate or compound the ongoing UME in any way. For minke whales, although the ongoing UME is under investigation (as occurs for all UMEs), this event does not provide cause for concern regarding population level impacts, as the likely population abundance is greater than 20,000 whales. Even though the PBR value is based on an abundance for U.S. waters that is negatively biased and a small fraction of the true population abundance, annual M/SI does not exceed the calculated PBR value for minke whales. With regard to humpback whales, the UME does not yet provide cause for concern regarding population-level impacts. Despite the UME, the relevant population of humpback whales (the West Indies breeding population, or distinct population segment (DPS)) remains healthy. The West Indies DPS, which consists of the whales whose breeding range includes the Atlantic margin of the Antilles from Cuba to northern Venezuela, and whose feeding range primarily includes the Gulf of Maine, eastern Canada, and western Greenland, was delisted. The status review identified harmful algal blooms, vessel collisions, and fishing gear entanglements as relevant threats for this DPS, but noted that all other threats are considered likely to have no or minor impact on population size or the growth rate of this DPS (Bettridge et al., 2015). As described in Bettridge et al. (2015), the West Indies DPS has a substantial population size (*i.e.,* approximately 10,000; Stevick et al., 2003; Smith et al., 1999; Bettridge et al., 2015), and appears to be experiencing consistent growth.

With regard to gray seals, harbor seals and harp seals, although the ongoing UME is under investigation, the UME does not yet provide cause for concern regarding population-level impacts to any of these stocks. For harbor seals, the population abundance is over 75,000 and annual M/SI (345) is well below PBR (2,006) (Hayes et al., 2018). For gray seals, the population abundance is over 27,000, and abundance is likely increasing in the U.S. Atlantic EEZ and in Canada (Hayes et al., 2018). For harp seals, the current population trend in U.S. waters is unknown, as is PBR (Hayes et al., 2018), however the population abundance is over 7 million seals, suggesting that the UME is unlikely to result in population-level impacts (Hayes et al., 2018).

Proposed authorized takes by Level A harassment for all species are very low (*i.e.,* no more than 12 takes by Level A harassment proposed for any of these species) and as described above, any Level A harassment would be expected to be in the form of slight PTS, *i.e.* minor degradation of hearing capabilities which is not likely to meaningfully affect the ability to forage or communicate with conspecifics. No serious injury or mortality is expected or proposed for authorization, and Level B harassment of North Atlantic right, humpback and minke whales and gray, harbor and harp seals will be reduced to the level of least practicable adverse impact through use of proposed mitigation measures. As such, the proposed authorized takes of North Atlantic right, humpback and minke whales and gray, harbor and harp seals would not exacerbate or compound the ongoing UMEs in any way.

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

- No mortality or serious injury is anticipated or proposed for authorization;
- The anticipated impacts of the proposed activity on marine mammals would be temporary behavioral changes due to avoidance of the project area and limited instances of Level A harassment in the form of a slight PTS for two marine mammal stocks;
- Potential instances of exposure above the Level A harassment threshold are expected to be relatively low for most species; any potential for exposures above the Level A harassment threshold would be minimized by proposed mitigation measures including clearance zones;
- Total proposed authorized takes as a percentage of population are low for all species and stocks (*i.e.,* less than 24 percent for one stock and less than 7 percent for the remaining 10 stocks);
- The availability of alternate areas of similar habitat value for marine mammals to temporarily vacate the project area during the proposed project to avoid exposure to sounds from the activity;
- Effects on species that serve as prey species for marine mammals from the proposed project are expected to be short-term and are not expected to result in significant or long-term consequences for individual marine mammals, or to contribute to adverse impacts on their populations;
- There are no known important feeding, breeding, calving or migratory areas in the project area.
- The proposed mitigation measures, including visual and acoustic monitoring, clearance zones, and soft start, are expected to minimize potential impacts to marine mammals.

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 sections 101(a)(5)(A) and (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.

We propose to authorize incidental take of 11 marine mammal stocks. The total amount of taking proposed for authorization is less than 24 percent for one of these stocks, and less than 7 percent for all remaining stocks (Table 11), which we consider to be relatively small percentages and we preliminarily find are small numbers of marine mammals relative to the estimated overall population abundances for those stocks.

Based on the analysis contained herein of the proposed activity (including the proposed mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS preliminarily finds that small numbers of marine mammals will be taken relative to the population size of all affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

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

Endangered Species Act (ESA)

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 whenever we propose to authorize take for endangered or threatened species.

NMFS is proposing to authorize take of North Atlantic right whales and fin whales, which are listed under the ESA. The NMFS Office of Protected Resources has requested initiation of Section 7 consultation with the NMFS Greater Atlantic Regional Fisheries Office for the issuance of this IHA. NMFS will conclude the ESA consultation prior to reaching a determination regarding the proposed issuance of the authorization.

Proposed Authorization

As a result of these preliminary determinations, NMFS proposes to issue an IHA to Transco for conducting construction activities in Raritan Bay for a period of one year, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. A draft of the proposed IHA can be found at: *www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act.*

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 action. We also request at this time comment on the potential 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 decisions on the request for this IHA or a subsequent Renewal.

On a case-by-case basis, NMFS may issue a one-year IHA renewal with an additional 15 days for public comments when (1) another year of identical or nearly identical activities as described in the Specified Activities section of this notice is planned or (2) the activities as described in the Specified Activities section of this notice would not be completed by the time the IHA expires and a Renewal would allow for completion of the activities beyond that described in the Dates and Duration section of this notice, 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 under the requested Renewal are identical to the activities analyzed under the initial IHA, are a subset of the activities, or include changes so minor (*e.g.,* reduction in pile size) that the changes do not affect the previous analyses, mitigation and monitoring requirements, or take estimates (with the exception of reducing the type or amount of take because only a subset of the initially analyzed activities remain to be completed under the Renewal).

(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 will remain the same and appropriate, and the findings in the initial IHA remain valid.

Dated: August 28, 2019.

Donna S. Wieting,

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

[FR Doc. 2019–18931 Filed 8–30–19; 8:45 am]

BILLING CODE 3510–22–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XR009

Taking of Marine Mammals Incidental to Specific Activities; Taking of Marine Mammals Incidental to Pile Driving Activities During Construction of a Ferry Terminal at Seaplane Lagoon, Alameda Point, San Francisco, California

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

ACTION: Notice; issuance of an incidental harassment authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that NMFS has issued an incidental harassment authorization (IHA) to the City of Alameda (City) to incidentally harass, by Level A and B harassment only, marine mammals during pile driving and removal activities during construction of a ferry terminal at Seaplane Lagoon, Alameda Point, San Francisco, California.

DATES: This Authorization is effective from August 20, 2019 through August 19, 2020.

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

SUPPLEMENTARY INFORMATION:

Background

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

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

Summary of Request

On February 22, 2019, NMFS received a request from the City for an IHA to take marine mammals incidental to pile driving activities during construction of a ferry terminal in Seaplane Lagoon, Alameda, California. The application was deemed adequate and complete on June 28, 2019. The applicant's request was for take seven species of marine mammals by Level B harassment only. Neither the City nor NMFS expects serious injury or mortality to result from