



DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648-XE883]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Demolition of Pier 10 and Construction of a Crane Weight Test Area Project at U.S. Naval Submarine Base New London

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

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

SUMMARY: NMFS has received a request from the U.S. Navy (Navy) for authorization to take marine mammals incidental to the demolition of Pier 10 and the construction of a Crane Weight Test Area (CWTA) at Naval Submarine Base (SUBASE) New London in Groton, Connecticut. 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-time, 1-year renewal that could be issued under certain circumstances and if all requirements are met, as described in **Request for Public Comments** at the end of this notice. NMFS will consider public comments prior to making any final decision on the issuance of the requested MMPA authorization and agency responses will be summarized in the final notice of our decision.

DATES: Comments and information must be received no later than **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: Comments should be addressed to the Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service and should be

submitted via email to ITP.hotchkin@noaa.gov. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities>. In case of problems accessing these documents, please call the contact listed below.

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, including all attachments, must not exceed a 25-megabyte file size. All comments received are a part of the public record and will generally be posted online at <https://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: Cara Hotchkin, Office of Protected Resources, NMFS, (301) 427-8401.

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 proposed or, if the taking is limited to harassment, a notice of a proposed IHA is 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 the species or stocks for taking for certain subsistence uses (referred to in shorthand as “mitigation”); and requirements pertaining to the monitoring and reporting of the takings. The definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below and can be found in section 3 of the MMPA (16 U.S.C. 1361 *et seq*) and NMFS regulations at 50 CFR 216.103.

National Environmental Policy Act

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

This action is consistent with categories of activities identified in Categorical Exclusion B4 (IHAs with no anticipated serious injury or mortality) 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 issuance of the proposed IHA qualifies to be categorically excluded from further NEPA review.

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

Summary of Request

Demolition of Pier 10 and upgrading of the quay wall to accommodate the construction of a new CWTA were part of a previously issued Letter of Authorization (83 FR 36773, July 31, 2018), which was effective until February 28, 2025. Because the project was not completed by February 28, 2025, and some pile driving elements have changed, the Navy is requesting a new one-year IHA for the demolition of Pier 10 and construction of a new CWTA. On February 24, 2025, NMFS received a request from the Navy for an IHA to take marine mammals incidental to construction associated with the New London Pier 10 and construction of a CWTA at SUBASE New London in Groton, Connecticut. Following NMFS' review of the application and associated discussions, the Navy submitted several revised versions of the application. The application was deemed adequate and complete on May 30, 2025. On July 22, 2025, the Navy notified NMFS that the project schedule had changed, with a new anticipated start date of August 1, 2026. The Navy's request is for take of five species of marine mammals, by Level B harassment only. Neither the Navy nor NMFS expect serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

Description of Proposed Activity

Overview

The Navy is proposing the demolition of Pier 10 and the upgrade of the quay wall to accommodate the construction of a new CWTA at SUBASE New London in Groton, Connecticut (figure 1). Pier 10 has exceeded its service life and is considered operationally inadequate. After demolition of the pier, fender piles will be installed on the quay wall. Construction of a new CWTA will involve demolition of the existing quay wall and reconstruction of a 46-foot-long portion of pile-supported quay wall structure north of Pier 33 to accommodate the construction of an area for storage of crane test weights. The proposed project includes impact and vibratory pile installation and

vibratory pile removal. For a portion of the piles, rock socket drilling (rotary drill) would be used inside the pipe casing to lift sediment.

Sounds resulting from pile driving, removal, and drilling may result in the incidental take of marine mammals by Level B harassment in the form of behavioral harassment. Underwater sound would be constrained to the Thames River and a small portion of the Long Island Sound and would be truncated by land masses in the river. Construction activities would start in August 2026 and last 12 months; in-water pile driving is expected to take approximately 80 (potentially non-consecutive) days.

Dates and Duration

The proposed IHA would be valid for the statutory maximum of 1 year from the date of effectiveness and will become effective upon written notification from the applicant to NMFS, but not beginning later than 1 year from the date of issuance or extending beyond 2 years from the date of issuance. All pile driving and removal would be completed during daylight hours.

Specific Geographic Region

The project is located at SUBASE New London in Groton, Connecticut (figure 1), which is located approximately 6 miles (mi), or 9.5 kilometers (km), up the Thames River from Long Island Sound. Project activities would occur at the existing Pier 10 and north of Pier 33.



Figure 1 -- Map of Proposed Project Area in Groton, Connecticut

Detailed Description of the Specified Activity

The project proposes to demolish Pier 10, including the removal of the existing concrete deck, utilities, support piles, and the fender system. The existing steel fender H-piles and wood piles would be extracted by crane and sling. In the unlikely event some of the steel fender piles cannot be pulled by crane and sling, they would be extracted by vibratory hammer. Therefore, vibratory extraction of a portion of the piles is assumed for the analysis. Wood piles that cannot be pulled will be cut below the mudline. The 24-inch concrete-encased steel H-piles and cast-in-place reinforced concrete piles would be extracted by vibratory hammer. After demolition of Pier 10, four 16-inch polymeric fender piles with H-pile extension would be installed by impact hammer on the pier's quay wall.

Construction of a new CWTA will occur concurrently with Pier 10 demolition. The existing quay wall includes steel fender H-piles, which would be removed by vibratory hammer, and 18-inch diameter concrete piles in rock sockets, which would be cut off below the mudline. A 46-foot-long pile-supported quay wall would be constructed north of Pier 33 to accommodate the construction of an area for storage of crane test weights. The concrete deck, deck equipment (light posts, cleats, *etc.*), fender system with steel fender H-piles, concrete support piles, and concrete pile caps associated with the existing quay wall will be demolished prior to the CWTA construction. CWTA construction includes the installation of 30-inch by 100-foot concrete-filled steel pipe piles and 16-inch fiberglass-reinforced plastic fender piles drilled into rock sockets. Table 1 provides a summary of the pile driving activities.

Concurrent Activities—In order to maintain project schedules, multiple pieces of equipment would operate at the same time within the project area between Pier 10 and the CWTA area. Piles may be extracted and installed on the same day, with a maximum of four vibratory hammers operating simultaneously. It is estimated that approximately

2.5 days in December and 2 days in January will have concurrent activities. Table 2 provides a summary of the expected concurrent activities.

Table 1 -- Number and Type of Piles to be Installed and/or Removed

Activity (Dates)	Pile Count ⁽¹⁾	Pile Type	Method of Installation/Removal	Piles Installed/Removed Per Work Day ⁽²⁾	Total Pile Driving/Extraction Days	Average Hammer/Drill Operation (Seconds Per Pile) ⁽³⁾	Average Hammer/Drill Operation (Seconds Per Day)
Pier 10 Demolition / Pile Removal (August 2026 – December 2027) <i>Concurrent with CWTA Demolition and CWTA Construction</i>	84	HP14x89 steel fender H-piles	Pulled by crane & sling	12.5	0	0	0
	24	HP14x89 steel fender piles	Vibratory extraction of estimated number of piles that cannot be pulled	9.5	2.5	3,600 seconds	34,200 seconds
	41	Wood piles	Pulled by crane & sling or cut below mudline	12.5	0	0	0
	24	24-inch concrete- encase steel H-piles	Vibratory hammer	9.5	2.5	1,200 seconds	11,400 seconds
	166	24-inch cast-in-place reinforced concrete piles	Vibratory hammer	9.5	17.5	1,200 seconds	11,400 seconds
Pier 10 Quay wall Construction/Repair (January-February 2027) <i>Concurrent with CWTA Construction</i>	4	16-inch polymeric fender piles w/ H-pile extension	Impact hammer	2	2	1,000 strikes	2,000 strikes
Activity (Dates)	Pile Count ⁽¹⁾	Pile Type	Method of Installation/Removal	Piles Installed/Removed Per Work Day ⁽²⁾	Total Pile Driving/Extraction Days	Average Hammer/Drill Operation (Seconds Per Pile) ⁽³⁾	Average Hammer/Drill Operation (Seconds Per Day)
CWTA Quay wall Demolition (November–December 2026)	5	HP14 steel fender H-piles	Vibratory hammer	3	1.67	7,200 seconds	21,600 seconds

<i>Concurrent with Pier 10 Demolition and CWTA Construction</i>	8	18-inch diameter concrete piles in rock sockets	Cut off below mudline	n/a	n/a	n/a	n/a
CWTA Construction / Pile Installation (December 2026) <i>Concurrent with Pier 10 Quay wall Construction/Repair</i>	18	30-inch x 100-ft concrete-filled steel pipe piles	Rock socket (rotary) drilling	0.5	36	15,000 seconds	7,500 seconds
CWTA Construction / Pile Installation (January 2027) <i>Concurrent with Pier 10 Demolition and CWTA Demolition</i>	9	16-inch fiberglass reinforced, plastic fender piles	Rock socket (rotary) drilling	0.5	18	7,500 seconds	3,750 seconds

Legend: n/a = not applicable

- Notes:
1. Pile count based on Waterfront Facilities Inspections and Assessments.
 2. Estimate provided by NAVFAC Mid-Atlantic Public Works Department; based on data from previous similar projects; assumes 5 workdays per week.
 3. Vibratory hammer measured in seconds per pile.

Table 2 -- Number and Type of Concurrent Piles to be Installed and Removed

Month and Year	Structure	Activities	Type, Pile Sizes, and Types Per Scenario	Equipment (Quantity)	Total Equipment Quantity	Total Concurrent Days
December 2026	Pier 10	Demolition/Removal	Vibratory extraction HP14x89 steel fender H-piles (2.5 days); Vibratory extraction 24-inch concrete-encased steel H-piles (2.5 days); Vibratory Extraction 24-inch cast-in-place reinforced concrete piles (17.5 days).	Vibratory hammer (4), rotary drill (1)	5	2.5
	CWTA	Demolition	Vibratory extraction HP14 Steel fender H-piles (1.67 days).			
		Construction/Pile Installation	Rock socket (rotary) drilling 30-inch x 100-ft concrete-filled, steel pipe piles (36 days).			

January 2027	Pier 10 Quay Wall	Construction/Repair	Impact installation of 16-inch polymeric fender piles with H-pile extension (2 days).	Impact hammer (1), and rotary drill (1)	2	2
	CWTA	Construction/Pile Installation	Rock socket (rotary) drilling of 16-inch fiberglass reinforced, plastic fender piles (18 days).			

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. NMFS fully considered all of this information, and we refer the reader to these descriptions, instead of reprinting the information. Additional information regarding population trends and threats may be found in NMFS' Stock Assessment Reports (SARs; <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments>) and more general information about these species (*e.g.*, physical and behavioral descriptions) may be found on NMFS' website (<https://www.fisheries.noaa.gov/find-species>).

Table 3 lists all species or stocks for which take is expected and proposed to be authorized for this activity and summarizes information related to the population or stock, including regulatory status under the MMPA and Endangered Species Act (ESA) and potential biological removal (PBR), where known. 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 serious injury or mortality is anticipated or proposed to be authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species or stocks 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' Atlantic SARs. All values presented in table 3 are the most recent available at the time of publication, including from the draft 2024 SARs, and are available online at <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports>.

Table 3 -- Marine Mammal Species¹ Likely Impacted by the Specified Activities

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N) ²	Stock abundance (CV, N _{min} , most recent abundance survey) ³	PBR	Annual M/SI ⁴
Order Odontoceti (toothed whales, dolphins, and porpoises)						
<i>Family Delphinidae</i>						
Common Dolphin	<i>Delphinus delphis</i>	Western N Atlantic	-, -, N	93,100 (0.56, 59,897, 2021)	1,452	414
<i>Family Phocoenidae (porpoises)</i>						
Harbor Porpoise	<i>Phocoena phocoena</i>	Gulf of Maine/ Bay of Fundy	-, -, N	85,765 (0.53, 56,420, 2021)	649	145
Order Carnivora – Pinnipedia						
<i>Family Phocidae (earless seals)</i>						
Harbor Seal	<i>Phoca vitulina</i>	Western N Atlantic	-, -, N	61,336 (0.08, 57,637, 2018)	1,729	339
Gray Seal	<i>Halichoerus grypus</i>	Western N Atlantic ⁵	-, -, N	27,911 (0.20, 23,624, 2021)	756	4,491
Harp Seal	<i>Pagophilus groenlandicus</i>	Western N Atlantic	-, -, N	7.6M (UNK, 7.1M, 2019)	426,000	178,573

¹Information on the classification of marine mammal species can be found on the web page for The Society for Marine Mammalogy's Committee on Taxonomy (<https://marinemammalscience.org/science-and-publications/list-marine-mammal-species-subspecies>).

²ESA status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

³NMFS marine mammal SARs online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments>. CV is coefficient of variation; N_{min} is the minimum estimate of stock abundance. In some cases, CV is not applicable

⁴These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (e.g., commercial fisheries, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.

⁵NMFS' stock abundance estimate (and associated PBR value) applies to the U.S. population only. Total stock abundance based on the minimum population estimate in U.S. waters is 23,624 and 359,332 in Canada, for a total N_{min} of 376,621. The annual M/SI value given is for the total stock.

As indicated above, all five species in table 3 temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur. All species that could potentially occur in the proposed project area are included in table 3-1 of the IHA

application. While North Atlantic right whale (*Eubalaena glacialis*), common minke whale (*Balaenoptera acutorostrata*), fin whale (*Balaenoptera physalus*), and humpback whale (*Megaptera novaeangliae*) have been documented in the area, the spatial and temporal occurrence of these species is such that take is not expected to occur, and they are not discussed further beyond the explanation provided here. These species occur at low densities at the mouth of the Thames River, extending into Long Island Sound, and do not normally occur in the Thames River. Sound from the project is only expected to propagate into the Long Island Sound during the concurrent pile driving in December (2.5 days). Only a small portion of the Long Island Sound would be ensonified, and therefore incidental take of these species is not anticipated.

Common Dolphin

The common dolphin is found world-wide in temperate to subtropical seas. In the North Atlantic, common dolphins are 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.*, 2024), but may be found in shallower shelf waters as well. They can be found from Cape Hatteras northeast to Georges Bank from mid-January to May and in Gulf of Maine from mid-summer to autumn (Hayes *et al.*, 2024). In the North Atlantic, common dolphins travel in pods with an average group size of 30 individuals (from AMAPPS (Palka *et al.*, 2017 and 2021)).

Common dolphins are expected to occur in the vicinity of the project area in Long Island Sound in moderate numbers but were not found in the Navy's Thames River study (Tetra Tech, 2020); however, common dolphins are likely to occur in Long Island Sound during mid-summer through fall with peak abundance in September (Northeast Ocean Data, 2023).

Harbor Porpoise

Harbor porpoise occur along the US and Canadian east coast (Hayes *et al.*, 2019). They rarely occur in waters warmer than 62.6° Fahrenheit (17° Celsius; Read, 1990). The Gulf of Maine/Bay of Fundy stock is found is concentrated in the northern Gulf of Maine and southern Bay of Fundy region, generally in waters less than 150 m deep (Waring *et al.*, 2017). During fall (October to December) and spring (April to June) harbor porpoises are widely dispersed from New Jersey to Maine. During winter (January to March), intermediate densities of harbor porpoises can be found in waters off New Jersey to North Carolina, and lower densities are found in waters off New York to New Brunswick, Canada. In the summer they are sighted primarily in the northern Gulf of Maine and southern Bay of Fundy. They are seen from the coastline to deep waters (>1800 m; Westgate *et al.*, 1998), although the majority of the population is found over the continental shelf (Waring *et al.*, 2017). In most areas, harbor porpoise occur in small groups of just a few individuals. Harbor porpoise must forage nearly continuously to meet their high metabolic needs (Wisniewska *et al.*, 2016). They consume up to 550 small fish (1.2–3.9 in [3–10 cm]) per hour at a nearly 90 percent capture success rate (Wisniewska *et al.*, 2016).

Harbor porpoise have not been documented in the Thames River (Tetra Tech, 2020) but are likely to occur near the mouth of the river and out into Long Island Sound during the fall, with peak abundance in December (Northeast Ocean Data, 2023).

Gray Seal

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.*, 2019). In U.S. waters, year-round breeding of approximately 400 animals has been documented on areas of outer Cape Cod and Muskeget Island in Massachusetts. They are a coastal species that generally remains within the continental shelf region but do venture into

deeper water to feed. Gray seals primarily feed on fish, squid, various crustacean species, and octopus.

Monthly observations over the 3-year marine mammal survey yielded a total of three sightings of individual gray seals (Tetra Tech, 2020). During marine mammal monitoring for Pier 32 construction activities that occurred from May 2022 through December 2022, no gray seals were observed (Navy, 2023).

Gray seals are common in Long Island Sound from September through June (Medic, 2005). Aerial surveys of haulout sites around Long Island in November 2018 recorded more than 900 harbor and gray seals (Atlantic Marine Conservation Society, 2018). The closest haulout site is approximately 10 miles (16 km) south of Pier 10 at Fishers Island in Long Island Sound. With the increase in populations, gray seals are likely to co-occur in the Thames River with, and would not always be distinguishable from, harbor seals. No seals were observed hauled out onshore (Tetra Tech, 2019) and there are no known haulout areas within the Thames River (Navy, 2018).

Harbor Seal

Harbor seals are found in all nearshore waters of the North Atlantic Ocean and adjoining seas above about lat. 30° N (Burns, 2009). In the western North Atlantic, harbor seals are distributed from the eastern Canadian Arctic and Greenland down the east coast of the United States (Hayes *et al.*, 2019). They occur seasonally along the coasts from southern New England to New Jersey from September through late May. Haulout and pupping sites are located off Manomet, MA, and the Isles of Shoals, ME (Waring *et al.*, 2016).

Harbor seals are central-place foragers (Orians and Pearson, 1979) and tend to exhibit strong site fidelity within season and across years, generally forage close to haulout sites, and repeatedly visit specific foraging areas (Grigg *et al.*, 2012; Suryan and Harvey, 1998; Thompson *et al.*, 1998). Harbor seals tend to forage at night and haul out

during the day (Grigg *et al.*, 2012; London *et al.*, 2001; Stewart and Yochem, 1994; Yochem *et al.*, 1987). Tide levels affect the maximum number of seals hauled out, with the largest number of seals hauled out at low tide, but time of day and season have the greatest influence on haul out behavior (Manugian *et al.*, 2017; Patterson and Acevedo-Gutiérrez, 2008; Stewart and Yochem, 1994). Harbor seals molt from May through June. Peak numbers of harbor seals haul out in late May to early June, which coincides with the peak molt. During both pupping and molting seasons, the number of seals and the length of time hauled out per day increase, from an average of 7 to 10–12 hours per day (Harvey and Goley, 2011; Huber *et al.*, 2001; Stewart and Yochem, 1994).

Harbor seals are the most commonly observed marine mammals in the Thames River. Monthly observations over the 3-year marine mammal survey yielded a total of 12 sightings of individual harbor seals (Tetra Tech, 2020). Most of the sightings were in the inner portion of the river, north of the I-95 Bridge. No seals were observed hauled out onshore (Tetra Tech, 2020), and there are no known haulout areas within the Thames River (Navy, 2018). During marine mammal monitoring for Pier 32 construction activities that occurred from May 2022 through December 2022, only one harbor seal was recorded (Navy, 2023). Harbor seal populations have increased in Connecticut since the 1980s and they are common in Long Island Sound from September through June (Medic, 2005).

Harp Seal

Harp seals are highly migratory and occur throughout much of the North Atlantic and Arctic Oceans (Hayes *et al.*, 2019). 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 (Hayes *et al.*, 2019). These appearances usually occur in January through May (Harris *et al.*, 2002), when the western North Atlantic stock is at its most southern point of migration.

Harp seals are not known to regularly occur in the Thames River as previous surveys have not recorded their presence (Tetra Tech, 2020). However, two harp seals were identified in March and one harp seal in April 2019 by Mystic Aquarium staff. On both occasions they were observed hauled out on the finger piers of the marina at SUBASE (Navy, 2019a). Harp seals are also expected to occur within Long Island Sound from January through May (Hayes *et al.*, 2022).

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. 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), Southall *et al.* (2019) recommended that marine mammals be divided into hearing groups based on directly measured (behavioral or auditory evoked potential techniques) or estimated hearing ranges (*e.g.*, behavioral response data, anatomical modeling). NMFS (2024) generalized hearing ranges were chosen based on the approximately 65-dB threshold from the composite audiograms, previous analysis in NMFS (2018), and/or data from Southall *et al.* (2007) and Southall *et al.* (2019). We note that the names of two hearing groups and the generalized hearing ranges of all marine mammal hearing groups have been recently updated (NMFS, 2024) as reflected below in table 4.

Table 4 -- Marine Mammal Hearing Groups (NMFS, 2024)

Hearing group	Generalized hearing range *
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 36 ** kHz.

High-frequency (HF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz.
Very High-frequency (VHF) cetaceans (true porpoises, <i>Kogia</i> , river dolphins, Cephalorhynchid, <i>Lagenorhynchus cruciger</i> & <i>L. australis</i>)	200 Hz to 165 kHz.
Phocid pinnipeds (PW) (underwater) (true seals)	40 Hz to 90 kHz.
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 68 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 the ~65-dB threshold from composite audiogram, previous analysis in NMFS (2018), and/or data from Southall *et al.* (2007) and Southall *et al.* (2019). Additionally, animals are able to detect very loud sounds above and below that “generalized” hearing range.

** NMFS is aware Houser *et al.*, (2024) data and data collected during a final field season by Houser *et al.* (in prep) have implications for the generalized hearing range for low-frequency cetaceans and their weighting function, however, as described in the 2024 Updated Technical Guidance, it is premature for us to propose any changes to our current Updated Technical Guidance. Mysticete hearing data is identified as a special circumstance that could merit reevaluating the acoustic criteria for low-frequency cetaceans in the 2024 Updated Technical Guidance once the data from the final field season is published. Therefore, we anticipate that once the data are published, it will likely necessitate updating this document (*i.e.*, likely after the data gathered in the summer 2024 field season and associated analysis are published).

For more detail concerning these groups and associated frequency ranges, please see NMFS (2024) for a review of available information.

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

This section provides a discussion of the ways in which components of the specified activity may impact marine mammals and their habitat. The **Estimated Take of Marine Mammals** 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 of Marine Mammals** 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 whether those impacts are reasonably expected to, or reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.

Description of Sound Sources

The marine soundscape is comprised of both ambient and anthropogenic sounds. Ambient sound is defined as the all-encompassing sound in a given place and is usually a composite of sound from many sources both near and far. The sound level of an area is defined by the total acoustical energy being generated by known and unknown sources.

These sources may include physical (*e.g.*, waves, wind, precipitation, earthquakes, ice, atmospheric sound), biological (*e.g.*, sounds produced by marine mammals, fish, and invertebrates), and anthropogenic sound (*e.g.*, vessels, dredging, aircraft, construction).

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

In-water construction activities associated with the project would include vibratory pile removal, drilling, and impact and vibratory pile driving. The sounds produced by these activities fall into one of two general sound types: impulsive and non-impulsive.

Impulsive sounds (*e.g.*, explosions, gunshots, sonic booms, impact pile driving) are typically transient, brief (less than 1 second), broadband, and consist of high peak sound pressure with rapid rise time and rapid decay (ANSI, 1986; NIOSH, 1998; ANSI, 2005; NMFS, 2018a). Non-impulsive sounds (*e.g.*, aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems) can be broadband, narrowband or tonal, brief or prolonged (continuous or intermittent), and typically do not have the high peak sound pressure with rapid rise/decay time that impulsive sounds do (ANSI, 1995; NIOSH, 1998; NMFS, 2018a). 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).

The proposed specified activities to use drilling, and vibratory and impact pile driving. Impact hammers operate by repeatedly dropping a heavy piston onto a pile to drive the pile into the substrate. Sound generated by impact hammers is characterized by rapid rise times and high peak levels, a potentially injurious combination (Hastings and Popper, 2005). Vibratory hammers install piles by vibrating them and allowing the weight of the hammer to push them into the sediment. Vibratory hammers produce significantly less sound than impact hammers. Peak sound pressure levels (SPLs) may be 180 dB or greater, but are generally 10 to 20 dB lower than SPLs generated during impact pile driving of the same-sized pile (Oestman *et al.*, 2009). Rise time is slower, reducing the probability and severity of injury, and sound energy is distributed over a greater amount of time (Nedwell and Edwards, 2002; Carlson *et al.*, 2005). Rotary drilling of rock sockets (*i.e.*, rotary drilling with spiral shaft through loose rock or soft sediment) would be used to remove sediment from the inside of the pipe pile casing after the casing has been driven to its required depth via vibratory and/or impact driving. The rock socket (rotary) is progressed through the casing and the sediment is lifted out of the casing. Rotary drills typically have lower sound levels than vibratory pile drivers (154 decibels referenced to 1 micro Pascal (dB re 1 μ Pa)).

The likely or possible impacts of the proposed activity on marine mammals could involve both non-acoustic and acoustic stressors. Potential non-acoustic stressors could result from the physical presence of equipment and personnel; however, any impacts to marine mammals are expected to be primarily acoustic in nature. Acoustic stressors include effects of heavy equipment operation during pile installation and removal.

Acoustic Effects

The introduction of anthropogenic noise into the aquatic environment from pile driving and removal is the means by which marine mammals may be harassed by the specified activity. In general, animals exposed to natural or anthropogenic sound may experience behavioral, physiological, and/or physical effects, ranging in magnitude from none to severe (Southall *et al.* 2007, 2019). In general, exposure to pile driving and removal noise has the potential to result in behavioral reactions (*e.g.*, avoidance, temporary cessation of foraging and vocalizing, changes in dive behavior) and, in limited cases, an auditory threshold shift (TS). Exposure to anthropogenic noise can also lead to non-observable physiological responses such as an increase in stress hormones. Additional noise in a marine mammal's habitat can mask acoustic cues used by marine mammals to carry out daily functions such as communication and predator and prey detection. The effects of pile driving noise on marine mammals are dependent on several factors, including, but not limited to, sound type (*e.g.*, impulsive vs. non-impulsive), the species, age and sex class (*e.g.*, adult male vs. mom with calf), duration of exposure, the distance between the pile and the animal, received levels, behavior at time of exposure, and previous history with exposure (Wartzok *et al.*, 2004; Southall *et al.* 2007). Here, we discuss physical auditory effects (TSs) followed by behavioral effects and potential impacts on habitat.

NMFS defines a noise-induced TS as a change, usually an increase, in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS, 2018, 2024). The amount of TS is customarily expressed in dB. A TS can be permanent or temporary. As described in NMFS (2018, 2024), there are numerous factors to consider when examining the consequence of TS, including, but not limited to, the signal temporal pattern (*e.g.*, impulsive or non-impulsive), likelihood an individual would be exposed for a long enough duration or to a high enough level to induce a TS, the magnitude of the TS, time

to recovery (seconds to minutes or hours to days), the frequency range of the exposure (*i.e.*, spectral content), the hearing and vocalization frequency range of the exposed species relative to the signal's frequency spectrum (*i.e.*, how animal uses sound within the frequency band of the signal; *e.g.*, Kastelein *et al.* 2014), and the overlap between the animal and the source (*e.g.*, spatial, temporal, and spectral).

Auditory Injury (AUD INJ) and Permanent Threshold Shift (PTS) —NMFS defines AUD INJ as “damage to the inner ear that can result in destruction of tissue... which may or may not result in PTS” (NMFS, 2024). NMFS defines PTS as a permanent, irreversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS, 2024). PTS does not generally affect more than a limited frequency range, and an animal that has incurred PTS has incurred some level of hearing loss at the relevant frequencies; typically, animals with PTS are not functionally deaf (Au and Hastings, 2008; Finneran, 2016). Available data from humans and other terrestrial mammals indicate that a 40 dB threshold shift approximates PTS onset (see Ward *et al.* 1958, 1959, 1960; Kryter *et al.*, 1966; Miller, 1974; Ahroon *et al.*, 1996; Henderson *et al.*, 2008). PTS levels for marine mammals are estimates, as with the exception of a single study unintentionally inducing PTS in a harbor seal (Kastak *et al.*, 2008), there are no empirical data measuring PTS in marine mammals largely due to the fact that, for various ethical reasons, experiments involving anthropogenic noise exposure at levels inducing PTS are not typically pursued or authorized (NMFS 2024, 2018).

Temporary Threshold Shift (TTS) —TTS is a temporary, reversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS 2024, 2018). Based on data from cetacean TTS measurements (Southall *et al.*, 2007), a TTS of 6 dB is considered the minimum TS clearly larger than any day-to-day or session-to-session variation in a

subject's normal hearing ability (Schlundt *et al.*, 2000; Finneran *et al.*, 2000, 2002). As described in Finneran (2015), marine mammal studies have shown the amount of TTS increases with cumulative sound exposure level (SEL_{cum}) in an accelerating fashion: At low exposures with lower SEL_{cum} , the amount of TTS is typically small and the growth curves have shallow slopes. At exposures with higher SEL_{cum} , the growth curves become steeper and approach linear relationships with the noise SEL.

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 (similar to those discussed in the *Auditory Masking* section, below). 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 takes place during a time when the animal is traveling through the open ocean, 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. We note that reduced hearing sensitivity as a simple function of aging has been observed in marine mammals, as well as humans and other taxa (Southall *et al.*, 2007), so we can infer that strategies exist for coping with this condition to some degree, though likely not without cost.

Many studies have examined noise-induced hearing loss in marine mammals (see Finneran (2015) and Southall *et al.* (2019) for summaries). TTS is the mildest form of hearing impairment that can occur during exposure to sound (Kryter, 2013). 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. For cetaceans, published data on the onset of TTS are limited

to captive bottlenose dolphin (*Tursiops truncatus*), beluga whale, harbor porpoise, and Yangtze finless porpoise (*Neophocoena asiaeorientalis*) (Southall *et al.*, 2019). For pinnipeds in water, measurements of TTS are limited to harbor seals, elephant seals, bearded seals (*Erignathus barbatus*) and California sea lions (Kastak *et al.*, 1999, 2007; Kastelein *et al.*, 2019b, 2019c, 2021, 2022a, 2022b; Reichmuth *et al.*, 2019; Sills *et al.*, 2020). TTS was not observed in spotted (*Phoca largha*) and ringed (*Pusa hispida*) seals exposed to single airgun impulse sounds at levels matching previous predictions of TTS onset (Reichmuth *et al.*, 2016). These studies examine hearing thresholds measured in marine mammals before and after exposure to intense or long-duration sound exposures. The difference between the pre-exposure and post-exposure thresholds can be used to determine the amount of threshold shift at various post-exposure times.

The amount and onset of TTS depends on the exposure frequency. Sounds at low frequencies, well below the region of best sensitivity for a species or hearing group, are less hazardous than those at higher frequencies, near the region of best sensitivity (Finneran and Schlundt, 2013). At low frequencies, onset-TTS exposure levels are higher compared to those in the region of best sensitivity (*i.e.*, a low frequency noise would need to be louder to cause TTS onset when TTS exposure level is higher), as shown for harbor porpoises and harbor seals (Kastelein *et al.*, 2019a, 2019c). Note that in general, harbor seals and harbor porpoises have a lower TTS onset than other measured pinniped or cetacean species (Finneran, 2015). In addition, TTS can accumulate across multiple exposures, but the resulting TTS will be less than the TTS from a single, continuous exposure with the same SEL (Mooney *et al.*, 2009; Finneran *et al.*, 2010; Kastelein *et al.*, 2014, 2015). This means that TTS predictions based on the total, cumulative SEL will overestimate the amount of TTS from intermittent exposures, such as sonars and impulsive sources. Nachtigall *et al.* (2018) describe measurements of hearing sensitivity of multiple odontocete species (bottlenose dolphin, harbor porpoise, beluga, and false

killer whale (*Pseudorca crassidens*)) when a relatively loud sound was preceded by a warning sound. These captive animals were shown to reduce hearing sensitivity when warned of an impending intense sound. Based on these experimental observations of captive animals, the authors suggest that wild animals may dampen their hearing during prolonged exposures or if conditioned to anticipate intense sounds. Another study showed that echolocating animals (including odontocetes) might have anatomical specializations that might allow for conditioned hearing reduction and filtering of low-frequency ambient noise, including increased stiffness and control of middle ear structures and placement of inner ear structures (Ketten *et al.*, 2021). Data available on noise-induced hearing loss for mysticetes are currently lacking (NMFS, 2018). Additionally, the existing marine mammal TTS data come from a limited number of individuals within these species.

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 that inducing mild TTS (*e.g.*, a 40-dB threshold shift approximates PTS onset (Kryter *et al.*, 1966; Miller, 1974), while a 6-dB threshold shift approximates TTS onset (Southall *et al.*, 2007, 2019). Based on data from terrestrial mammals, a precautionary assumption is that the PTS thresholds for impulsive 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, 2019). 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.

Activities for this project include impact and vibratory pile driving and vibratory removal. There would likely be pauses in activities producing the sound during each day. Given these pauses and the fact that many marine mammals are likely moving through the project areas and not remaining for extended periods of time, the potential for TS declines.

Behavioral Harassment—Exposure to noise from drilling and pile driving and removal can also have the potential to behaviorally disturb marine mammals. Generally speaking, NMFS considers a behavioral disturbance that rises to the level of harassment under the MMPA a non-minor response—in other words, not every response qualifies as behavioral disturbance, and for responses that do, those of a higher level, or accrued across a longer duration, have the potential to affect foraging, reproduction, or survival. 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 may include changing durations of surfacing and dives, changing direction and/or speed; reducing/increasing vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); eliciting a visible startle response or aggressive behavior (such as tail/fin slapping or jaw clapping); avoidance of areas where sound sources are located. Pinnipeds may increase their haul out time, possibly to avoid in-water disturbance (Thorson and Reyff, 2006).

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.*, 2004; Southall *et al.*, 2007, 2019; 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). In general, pinnipeds seem more tolerant of, or at least habituate more quickly to, potentially disturbing underwater sound than do cetaceans, and generally seem to be less responsive to exposure to industrial sound than most cetaceans. Please see Appendices B and C of Southall *et al.* (2007) and Gomez *et al.* (2016) for reviews 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.*, 2004). 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 above, 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; Wartzok *et al.*, 2004; National Research Council (NRC), 2005). 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 (*e.g.*, seismic airguns) have been varied but often consist of avoidance behavior

or other behavioral changes (Richardson *et al.*, 1995; Morton and Symonds, 2002; Nowacek *et al.*, 2007).

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

Changes in dive behavior can vary widely and may consist of increased or decreased dive times and surface intervals as well as changes in the rates of ascent and descent during a dive (*e.g.*, Frankel and Clark, 2000; Costa *et al.*, 2003; Ng and Leung, 2003; Nowacek *et al.*, 2004; Goldbogen *et al.*, 2013a, 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. However, acoustic and movement bio-logging tools have been used in some cases, to infer responses of feeding to anthropogenic noise. For example,

Blair *et al.* (2016) reported significant effects on humpback whale foraging behavior in Stellwagen Bank in response to ship noise including slower descent rates, and fewer side-rolling events per dive with increasing ship noise. In addition, Wisniewska *et al.* (2018) reported that tagged harbor porpoises demonstrated fewer prey capture attempts when encountering occasional high-noise levels resulting from vessel noise as well as more vigorous fluking, interrupted foraging, and cessation of echolocation signals observed in response to some high-noise vessel passes.

In response to playbacks of vibratory pile driving sounds, captive bottlenose dolphins showed changes in target detection and number of clicks used for a trained echolocation task (Branstetter *et al.*, 2018). Similarly, harbor porpoises trained to collect fish during playback of impact pile driving sounds also showed potential changes in behavior and task success, though individual differences were prevalent (Kastelein *et al.*, 2019d). 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 relationships among prey availability, foraging effort and success, and the life history stage(s) 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). For example, harbor porpoise' respiration rate increased in response to pile driving sounds at and above a received broadband SPL of 136 dB (zero-peak SPL: 151 dB (re 1 μPa); SEL of a single strike: 127 dB re 1 μPa^2 -s) (Kastelein *et al.*, 2013).

Avoidance is the displacement of an individual from an area or migration path as a result of the presence of a sound or other stressors, and is one of the most obvious manifestations of disturbance in marine mammals (Richardson *et al.*, 1995). For example, gray whales are known to change direction—deflecting from customary migratory paths—in order to avoid noise from seismic surveys (Malme *et al.*, 1984). Avoidance may be short-term, with animals returning to the area once the noise has ceased (*e.g.*, Bowles *et al.*, 1994; Goold, 1996; Stone *et al.*, 2000; Morton and Symonds, 2002; Gailey *et al.*, 2007). Longer-term displacement is possible, however, which may lead to changes in abundance or distribution patterns of the affected species in the affected region if habituation to the presence of the sound does not occur (*e.g.*, Blackwell *et al.*, 2004; Bejder *et al.*, 2006; 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; Bowers *et al.*, 2018). 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 (England *et al.*, 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 fishes 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 5-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 1 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 (*i.e.*, meaningful) 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 would 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), however distress is an unlikely result of this project based on observations of marine mammals during previous, similar projects in the area.

Auditory Masking —Since many marine mammals rely on sound to find prey, moderate social interactions, and facilitate mating (Tyack, 2008), noise from anthropogenic sound sources can interfere with these functions, but only if the noise spectrum overlaps with the hearing sensitivity of the receiving marine mammal (Southall *et al.*, 2007; Clark *et al.*, 2009; Hatch *et al.*, 2012). Chronic exposure to excessive, though not high-intensity, noise could cause masking at particular frequencies for marine mammals that utilize sound for vital biological functions (Clark *et al.*, 2009). Acoustic masking is when other noises such as from human sources interfere 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). Therefore,

under certain circumstances, marine mammals whose acoustical sensors or environment are being severely masked could also be impaired from maximizing their performance fitness in survival and reproduction. 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 (Hotchkin and Parks, 2013).

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) or vocalizations (Foote *et al.*, 2004), respectively, while North Atlantic right whales (*Eubalaena glacialis*) have been observed to shift the frequency content of their calls upward while reducing the rate of calling in areas of increased anthropogenic noise (Parks *et al.*, 2007). Fin whales have also been documented lowering the bandwidth, peak frequency, and center frequency of their vocalizations under increased levels of background noise from large vessels (Castellote *et al.*, 2012). Other alterations to communication signals have also been observed. For example, gray whales, in response to playback experiments exposing them to vessel noise, have been observed increasing their vocalization rate and producing louder signals at times of increased outboard engine noise (Dahlheim and Castellote, 2016). Alternatively, animals may cease sound production during production of aversive signals (Bowles *et al.*, 1994).

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 human-made, it may be considered harassment when disrupting or altering critical behaviors. It is important to distinguish TTS and PTS, which persist after the sound exposure, from masking, which occurs during the sound exposure. Because masking (without resulting in TS) is not associated with abnormal physiological function, it is not considered a physiological effect, but rather a potential behavioral effect (though not necessarily one that would be associated with harassment).

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, 2010; 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 (Hotchkin and Parks, 2013). 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).

Marine mammals at or near the proposed project site may be exposed to anthropogenic noise which may be a source of masking. Vocalization changes may result from a need to compete with an increase in background noise and include increasing the source level, modifying the frequency, increasing the call repetition rate of vocalizations, or ceasing to vocalize in the presence of increased noise (Hotchkin and Parks, 2013). For example, in response to loud noise, beluga whales may shift the frequency of their echolocation clicks to prevent masking by anthropogenic noise (Eickmeier and Vallarta, 2022).

Masking occurs in the frequency band or bands that animals utilize and is more likely to occur in the presence of broadband, relatively continuous noise sources such as vibratory pile driving. Energy distribution of pile driving covers a broad frequency spectrum, and sound from pile driving would be within the audible range of pinnipeds and cetaceans present in the proposed action area. While some construction during the specified activities may mask some acoustic signals that are relevant to the daily behavior of marine mammals, the short-term duration and limited areas affected make it very unlikely that the fitness of individual marine mammals would be impacted.

Airborne Acoustic Effects—Pinnipeds that may occur near the project site could be exposed to airborne sounds associated with construction activities that have the potential to cause behavioral harassment, depending on their distance from these activities. Airborne noise would primarily be an issue for pinnipeds that are swimming or hauled out near the project site within the range of noise levels elevated above airborne acoustic harassment criteria. There is also a possibility that an animal could surface in-water, but with head out, within the area in which airborne sound exceeds relevant thresholds and thereby be exposed to levels of airborne sound that we associate with harassment. However, as a result of the mitigation and monitoring measures and due to the infrequent occurrence of marine mammals in the area, takes by behavioral harassment

resulting from airborne sounds that would result in harassment as defined under the MMPA are not expected.

Marine Mammal Habitat Effects

The proposed specified activities could have localized, temporary impacts on marine mammal habitat and their prey by increasing in-water SPLs and slightly decreasing water quality. Increased noise levels may affect acoustic habitat (see *Auditory Masking* discussion above) and adversely affect marine mammal prey in the vicinity of the project area (see discussion below). During drilling, in-water vibratory and impact pile driving, elevated levels of underwater noise would ensonify the project area where both fish and some mammals occur and could affect foraging success.

Water Quality —Temporary and localized reduction in water quality would occur as a result of in-water construction activities. Most of this effect would occur during the installation and removal of piles when bottom sediments are disturbed. The installation and removal of piles would disturb bottom sediments and may cause a temporary increase in suspended sediment in the project area. During pile removal, sediment attached to the pile moves vertically through the water column until gravitational forces cause it to slough off under its own weight. The small resulting sediment plume is expected to settle out of the water column within a few hours. Studies of the effects of turbid water on fish (marine mammal prey) suggest that concentrations of suspended sediment can reach thousands of milligrams per liter before an acute toxic reaction is expected (Burton, 1993).

Effects to turbidity and sedimentation are expected to be short-term, minor, and localized. Suspended sediments in the water column should dissipate and quickly return to background levels in all construction scenarios. Turbidity within the water column has the potential to reduce the level of oxygen in the water and irritate the gills of prey fish species in the proposed project area. However, turbidity plumes associated with the

project would be temporary and localized, and fish in the proposed project area would be able to move away from and avoid the areas where plumes may occur. Therefore, it is expected that the impacts on prey fish species from turbidity, and therefore on marine mammals, would be minimal and temporary. In general, the area likely impacted by the proposed construction activities is relatively small compared to the available marine mammal habitat in the area, and does not include any areas of particular importance.

In-Water Construction Effects on Potential 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., Zelik *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 greatest potential impact to fishes during construction would occur during impact pile installation. In-water construction activities would only occur during daylight hours, allowing fish to forage and transit the project area in the evening. Vibratory pile driving would possibly elicit behavioral reactions from fishes such as temporary avoidance of the area but is unlikely to cause injuries to fishes or have persistent effects on local fish populations. Construction also would have minimal permanent and

temporary impacts on benthic invertebrate species, a marine mammal prey source. In addition, it should be noted that the area in question is low-quality habitat since it is already highly developed and experiences a high level of anthropogenic noise from normal operations and other vessel traffic. In general, any negative impacts on marine mammal prey species are expected to be minor and temporary.

Fish populations in the proposed project area that serve as marine mammal prey could be temporarily affected by noise from pile installation and removal. The frequency range in which fishes generally perceive underwater sounds is 50 to 2,000 Hz, with peak sensitivities below 800 Hz (Popper and Hastings, 2009). Fish behavior or distribution may change, especially with strong and/or intermittent sounds that could harm fishes. High underwater SPLs have been documented to alter behavior, cause hearing loss, and injure or kill individual fish by causing serious internal injury (Hastings and Popper, 2005).

The most likely impact to fish from drilling and pile driving and removal activities in the project area would be temporary behavioral avoidance of the area. The duration of fish avoidance of an area after pile driving and drilling 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 and drilling events.

In-Water Construction Effects on Potential Foraging Habitat —The area likely impacted by the project is relatively small compared to the available habitat in the New England area and does not include any biologically important areas (BIAs) or ESA-designated critical habitat. The total area affected by the project is small compared to the vast foraging area available to marine mammals in the area. Pile driving and removal at the project site would not obstruct long-term movements or migration of marine mammals.

Avoidance by potential prey (*i.e.*, fish) of the immediate area due to the temporary loss of this foraging habitat is also possible. The duration of fish and marine mammal avoidance of this area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution, and behavior is anticipated. Any behavioral avoidance by fish or marine mammals of the disturbed area would still leave significantly large areas of fish and marine mammal foraging habitat in the nearby vicinity.

In summary, given the short daily duration of sound associated with individual pile driving events and the relatively small areas being affected, pile driving activities associated with the proposed action are not likely to have a permanent adverse effect on any fish habitat, or populations of fish species. 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. Thus, 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.

Estimated Take of Marine Mammals

This section estimates the number of incidental takes proposed for authorization through the IHA. This information will inform NMFS' consideration of “small numbers” and the negligible impact determinations.

Harassment is the only type of take expected to result from these activities. Except for 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

disrupting behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes would be by Level B harassment, as using acoustic sources (*i.e.*, vibratory or impact pile driving and rotary drilling) can potentially disrupt behavioral patterns for individual marine mammals. However, the proposed mitigation and monitoring measures are expected to minimize the severity of the taking to the extent practicable. As described previously, no serious injury or mortality is anticipated or proposed to be authorized for this activity. Below, we describe how the proposed take numbers are estimated.

For acoustic impacts, generally speaking, we estimate take by considering (1) acoustic criteria above which NMFS believes the best available science indicates that marine mammals would likely be behaviorally harassed or incur some degree of AUD INJ; (2) the area or volume of water that would be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and (4) the number of days of activities. While these factors can contribute to a basic calculation to provide an initial prediction of potential 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 in more detail and present the proposed take estimates.

Acoustic Criteria

NMFS recommends using acoustic criteria to identify the received level of underwater sound above which exposed marine mammals would reasonably expect to be behaviorally harassed (equated to Level B harassment) or incur AUD INJ of some degree (equated to Level A harassment). We note that the criteria for AUD INJ and the names of two hearing groups have been recently updated (NMFS 2024), as reflected below in the Level A Harassment section.

Level B Harassment —Though significantly driven by the received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source or exposure context (*e.g.*, frequency, predictability, duty cycle, duration of the exposure, signal-to-noise ratio, distance to the source), the environment (*e.g.*, bathymetry, other noises in the area, predators in the area), and the receiving animals (hearing, motivation, experience, demography, life stage, depth) and can be complex to predict (*e.g.*, Southall *et al.* 2007, 2021; Ellison *et al.* 2012). Based on what the available science indicates and the practical need to use a threshold based on a predictable and measurable metric for most activities, NMFS typically uses a generalized acoustic threshold based on the received level to estimate the onset of behavioral harassment. NMFS generally predicts that marine mammals are likely to be behaviorally harassed in a manner considered to be Level B harassment when exposed to underwater anthropogenic noise above root-mean-squared pressure received levels (RMS SPL) of 120 dB re 1 μ Pa for continuous (*e.g.*, vibratory pile driving, drilling) and above RMS SPL 160 dB re 1 μ Pa for non-explosive impulsive (*e.g.*, seismic airguns) or intermittent (*e.g.*, scientific sonar) sources. Generally speaking, Level B harassment take estimates based on these behavioral harassment thresholds are expected to include any likely takes by TTS. In most cases, the likelihood of TTS occurring at distances from the source is less than at which behavioral harassment is probable. TTS of a sufficient degree can manifest as behavioral harassment, as reduced hearing sensitivity and the potential reduced opportunities to detect essential signals (conspecific communication, predators, and prey) may result in changes in behavior patterns that would not otherwise occur.

The proposed activity includes continuous (vibratory pile driving, rotary drilling) and impulsive (impact pile driving) sources; therefore, the RMS SPL thresholds of 120 and 160 dB re 1 μ Pa are applicable.

Level A Harassment —NMFS' Updated Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 3.0) (NMFS 2024) identifies dual criteria to assess AUD INJ (Level A harassment) to five different underwater 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 proposed activity includes using impulsive (impact pile driving) and non-impulsive (vibratory pile driving/removal, drilling) sources.

The 2024 Updated Technical Guidance criteria include updated thresholds and weighting functions for each hearing group, provided in table 5 below. The references, analysis, and methodology used to develop the criteria are described in NMFS' 2024 Updated Technical Guidance, which may be accessed at <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance-other-acoustic-tools>.

Table 5 -- Thresholds Identifying the Onset of Permanent Threshold Shift (AUD INJ)

Hearing Group	AUD INJ Onset Thresholds* (Received Level)	
	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	<i>Cell 1</i> $L_{p,0-pk,flat}$: 222 dB $L_{E,p,LF,24h}$: 183 dB	<i>Cell 2</i> $L_{E,p,LF,24h}$: 197 dB
High-Frequency (HF) Cetaceans	<i>Cell 3</i> $L_{p,0-pk,flat}$: 230 dB $L_{E,p,HF,24h}$: 193 dB	<i>Cell 4</i> $L_{E,p,HF,24h}$: 201 dB
Very High-Frequency (VHF) Cetaceans	<i>Cell 5</i> $L_{p,0-pk,flat}$: 202 dB $L_{E,p,VHF,24h}$: 159 dB	<i>Cell 6</i> $L_{E,p,VHF,24h}$: 181 dB
Phocid Pinnipeds (PW) (Underwater)	<i>Cell 7</i> $L_{p,0-pk,flat}$: 223 dB $L_{E,p,PW,24h}$: 183 dB	<i>Cell 8</i> $L_{E,p,PW,24h}$: 195 dB
Otariid Pinnipeds (OW) (Underwater)	<i>Cell 9</i> $L_{p,0-pk,flat}$: 230 dB $L_{E,p,OW,24h}$: 185 dB	<i>Cell 10</i> $L_{E,p,OW,24h}$: 199 dB
* Dual metric thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating AUD INJ onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds are recommended for consideration.		
Note: Peak sound pressure level ($L_{p,0-pk}$) has a reference value of 1 μ Pa, and weighted cumulative sound exposure level ($L_{E,p}$) has a reference value of 1 μ Pa ² s. In this Table, thresholds are abbreviated to be more reflective of International Organization for Standardization standards (ISO 2017). The subscript		

“flat” is being included to indicate peak sound pressure are flat weighted or unweighted within the generalized hearing range of marine mammals (*i.e.*, 7 Hz to 165 kHz). The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, HF, and VHF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The weighted 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 thresholds will be exceeded.

Ensonified Area

Here, we describe the operational and environmental parameters of the activity used in estimating the area ensonified above the acoustic thresholds, including source levels and transmission loss coefficient.

The sound field in the project area is the existing background noise plus additional construction noise from the proposed project. Marine mammals are expected to be affected via sound generated by the primary components of the project (*i.e.*, vibratory pile driving, vibratory pile removal, impact pile driving, and rotary drilling).

Level B Harassment Zones

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, bottom composition, and topography. The general formula for underwater TL is:

$$TL = B * \text{Log}_{10} (R_1 / R_2),$$

Where

TL = transmission loss in dB

B = transmission loss coefficient; for practical spreading equals 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 depends on various factors, most notably the water bathymetry and the 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 ($20 \cdot \log_{10}[\text{range}]$). 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 ($10 \cdot \log_{10}[\text{range}]$). A practical spreading value of 15 is often used under conditions such as the project site, where water increases with depth as the receiver moves away from the shoreline, resulting in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions. Practical spreading loss is assumed here.

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 occurs. To calculate the distances to the Level A harassment and the Level B harassment sound thresholds for the methods and piles being used in this project, NMFS used acoustic monitoring data from other locations to develop proxy source levels for the various pile types, sizes, and methods. The project includes vibratory and impact pile installation, vibratory removal of piles, and drilling. Source levels for each pile size and driving method are presented in table 6.

Table 6 -- Proxy Sound Source Levels for Pile Sizes, Driving Methods, and Drilling

Pile Type	Installation/Extraction Method	Pile Diameter	<i>Peak</i> (dB re 1 μPa)	<i>RMS</i> (dB re 1 μPa)	<i>SEL</i> (dB re 1 $\mu\text{Pa}^2 \text{ sec}$)	Source
Steel H-pile	Vibratory	14-inch	NA	158	158	Navy, 2019b, Table 6-4

Concrete-encased Steel H-piles, and Cast-in-place	Vibratory	24-inch	NA	162	NA	Greenbusch 2018
Fiberglass, reinforced plastic	Vibratory	16-inch	NA	158	NA	Illingworth and Rodkin, 2017
	Impact	16-inch	177	165	157	California Department of Transportation, 2015
Concrete-filled steel pipe piles and fiberglass reinforced plastic fender piles	Rock Socket Rotary Drilling	All sizes	NA	154	NA	Dazey <i>et al.</i> , 2012

Notes: All sound pressure levels (SPLs) are unattenuated; dB=decibels; SEL = sound exposure level; single strike SEL are the proxy source levels presented for impact pile driving and were used to calculate distances to AUD INJ; dB re 1 μ Pa = dB referenced to a pressure of 1 microPascal, measures underwater SPL dB re 1 μ Pa²-sec = dB referenced to a pressure of 1 microPascal squared per second.

The farthest extent to the Level B harassment threshold for marine mammals would be a distance of 6,310 meters during vibratory extraction of 24-inch concrete-encased steel H-piles and 24-inch cast-in-place reinforced concrete piles from Pier 10 (table 8). However, this distance would be truncated due to the presence of intersecting land masses and would encompass a maximum area of 3.85 sq km.

Vibratory extraction of the HP14x89 steel fender piles would create the largest predicted Level A harassment isopleth, with a radius of 33.6 meters. Vibratory extraction of 24-inch cast-in-place reinforced concrete piles would create the largest Level B harassment zone for approximately 18 days. Level A and Level B harassment radii would be larger at 84.4 meters and 8,577 meters, respectively during concurrent activities that would occur for approximately 3 days (table 8).

Table 7 – Calculated Distances to Harassment Thresholds for Individual Activities: Impulsive (Impact Pile Driving)

Structure	Pile Size and Type	Activity	Total Production Days	Level A (AUD INJ Onset) Harassment			Level B (Behavioral) Harassment – All Marine Mammals
				HF Cetacean	VHF Cetacean	Phocid	
				Maximum Distance to 193 dB SEL _{cum} Threshold (m)/ Area of Harassment Zone (sq km)	Maximum Distance to 159 dB SEL _{cum} Threshold(m)/ Area of Harassment Zone (sq km)	Maximum Distance to 183 dB SEL _{cum} Threshold(m)/ Area of Harassment Zone (sq km)	Maximum Distance 160 dB RMS SPL Threshold (m)/ Area of Harassment Zone (sq km)
Pier 10 Quay Wall Construction/Repair (January – February 2026)	16-inch polymeric fender piles with H-pile extension	Impact Install	2	3.7/ <0.001	45.2/0.004	25.9/0.001	22/ <0.001

Legend: AUD INJ = Auditory Injury; HF = high frequency; VHF = very high frequency; dB SEL_{cum} = cumulative sound exposure level; m = meter; sq km = square kilometer; dB RMS SPL = decibel root mean square sound pressure level.

Table 8 – Calculated Distances to Harassment Thresholds for Individual Activities: Non-Impulsive Continuous (Vibratory Installation/Extraction and Rock Socket [Rotary] Drilling)

Structure	Pile Size and Type	Activity	Total Production Days	Level A (AUD INJ Onset) Harassment			Level B (Behavioral) Harassment – All Marine Mammals
				HF Cetacean	VHF Cetacean	Phocid	
				Maximum Distance to 201 dB SEL _{cum} Threshold (m)/ Area of Harassment Zone (sq km)	Maximum Distance to 181 dB SEL _{cum} Threshold(m)/ Area of Harassment Zone (sq km)	Maximum Distance to 195 dB SEL _{cum} Threshold(m)/ Area of Harassment Zone (sq km)	Maximum Distance 120 dB RMS SPL Threshold (m)/ Area of Harassment Zone (sq km)
Pier 10 Demolition/Pile Removal (August – December 2026)	HP14x89 steel Fender H-piles	Vibratory Extraction	2.5	10/ <0.001	21.3/0.001	33.6/0.004	3,415/2.92
	24-inch concrete-encased steel H-piles	Vibratory Extraction	2.5	8.9/ <0.001	18.9/0.001	29.8/0.003	6,310/3.86
	24-inch cast-in-place reinforced concrete piles	Vibratory Extraction	17.5	8.9/ <0.001	18.9/0.001	29.8/0.003	6,310/3.86
CWTA Quay Wall Demolition (November – December 2026)	HP14 Steel Fender H-piles	Vibratory Extraction	1.67	7.4/ <0.001	15.7/ <0.001	24.7/0.001	3,415/1.04

CWTA Construction/Pile Installation (December 2026)	30-inch x 100- ft concrete- filled, steel pipe piles	Rock socket (rotary) drilling	36	0.2/0	0.2/0	0.6/ <0.001	1,848/0.772
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Legend: AUD INJ = Auditory Injury; HF = high frequency; VHF = very high frequency; dB SELcum = cumulative sound exposure level; m = meter; sq km = square kilometer; dB RMS SPL = decibel root mean square sound pressure level.

When two noise sources have overlapping sound fields, there is potential for higher sound levels than for non-overlapping sources because the isopleth of one sound source encompasses the sound source of another isopleth. In such instances, the sources are considered additive and combined using the rules of decibel addition. For addition of two simultaneous sources, the difference between the two sound source levels is calculated, and if that difference is between 0 and 1 dB, 3 dB are added to the higher sound source levels; if the difference is between 2 or 3 dB, 2 dB are added to the highest sound source levels; if the difference is between 4 to 9 dB, 1 dB is added to the highest sound source levels; and with differences of 10 or more decibels, there is no addition. For simultaneous usage of three or more continuous sound sources, the three overlapping sources with the highest sound source levels are identified. Of the three highest sound source levels, the lower two are combined using the above rules; then, the combination of the lower two is combined with the highest of the three. For example, with overlapping isopleths from 24-, 36-, and 42-inch diameter steel pipe piles with sound source levels of 161, 167, and 168 dB RMS respectively, the 24- and 36-inch would be added together; given that $167 - 161 = 6$ dB, then 1 dB is added to the highest of the two sound source levels (167 dB), for a combined noise level of 168 dB. Next, the newly calculated 168 dB is added to the 42-inch steel pile with sound source levels of 168 dB. Since $168 - 168 = 0$ dB, 3 dB is added to the highest value, or 171 dB in total for the combination of 24-, 36-, and 42-inch steel pipe piles.

By using the rules of decibel addition method, a revised proxy source for Level A and Level B analysis was determined for the use of the concurrent non-impulsive activity scenarios. The revised proxy values are presented in table 9 and the resulting harassment zones for concurrent activities are shown in table 10.

There is one anticipated scenario when an impact hammer and vibratory hammer and extractor are occurring simultaneously. In the situation where an impact and

vibratory hammer are used concurrently, the largest zone generated by either the vibratory hammer or impact hammer would be used (table 2).

				Harassment Zone (sq km)	a of Harassment Zone (sq km)		
Concurrent Pile Driving (3 days) of vibratory extraction of HP14x89 steel H-piles from Pier 10, Vibratory extraction of HP14 Steel fender H-piles from CWTA, Rock socket (rotary) drilling of 30-inch x 100-ft concrete-filled steel pipe for CWTA construction.	HP14x89 steel H-pile, 24-inch concrete-encased steel H-Piles, 24-inch cast-in-place reinforced concrete piles, 30-inch x 100-ft concrete-filled steel pipe	Vibratory Extract and Rock socket (rotary) Drill	2.5	25.2/0.002 ⁽¹⁾	53.6/0.009 ⁽¹⁾	84.4/0.022 ⁽¹⁾	8,577/4.57 ⁽¹⁾
				0.8/< 0.001 ⁽²⁾	1.1/< 0.001 ⁽²⁾	2.8/< 0.001 ⁽²⁾	8,577/1.04 ⁽²⁾

Legend: AUD INJ = Auditory Injury; HF = high frequency; VHF = very high frequency; dB SEL_{cum} = cumulative sound exposure level; m = meter; sq km = square kilometer; dB RMS SPL = decibel root mean square sound pressure level.

- Notes:*
1. Harassment zones mapped from Pier 10
 2. Harassment zones mapped from CWTA

Marine Mammal Occurrence and Take Estimation

In this section, we provide information about the occurrence of marine mammals, including density or other relevant information that will inform the take calculations, and describe how the information provided is synthesized to produce a quantitative estimate of the take that is reasonably likely to occur and proposed for authorization. Density estimates come from Northeast Ocean Data (2023) for cetaceans and from the U.S. Navy Marine Species Density Database (NMSDD; Navy, 2023) for pinnipeds. For the purpose of assessing impacts from underwater sound, the Navy assumed that all cetacean and pinniped species spend 100 percent of their time in the water. This approach is conservative because seals spend a portion of their time hauled-out and, therefore, are expected to be exposed to less sound than is estimated by this approach. Cetacean densities were derived from Northeast Ocean Data to determine Level B harassment takes as cetaceans do not occur in the Thames River, and Level A harassment exposure for those species would not occur as Level A harassment noise would be localized to the river. To determine the number of animals potentially exposed within the harassment zone, the following equation was used:

$$\text{Exposure estimate} = (N \times \text{Harassment Zone}) \times \text{maximum days of pile driving}$$

Where:

N = density estimate used for each species

Harassment Zone = the area where noise exceeds the noise threshold value

The following assumptions were used to calculate potential exposures to impact and vibratory pile driving noise for each threshold:

- Each animal can be “taken” via Level B harassment once every 24 hours.
- All piles would have an underwater noise disturbance distance equal to the pile that causes the greatest noise disturbance (*i.e.*, the pile farthest from shore)

installed with the method that has the largest harassment zone. If vibratory pile driving/extracting would occur, the largest harassment zone for Level B harassment would be produced by vibratory driving/extracting. In this case, the harassment zone for an impact hammer would be encompassed by the larger harassment zone from the vibratory driver/extractor.

- Days of construction and demolition were conservatively based on a relatively slow daily production rate, but actual daily production rates may be higher, resulting in fewer actual pile driving/extracting and drilling days. The production days are used solely to assess the number of days during which pile driving/extracting and drilling could occur if production were delayed due to equipment maintenance, safety, *etc.* In a real construction situation, production rates would be maximized when possible.

A subset of the species (common dolphin and harbor porpoise) do not occur within the Thames River and have only been observed in the Long Island Sound. For these species, the area from the mouth of the Thames River to the furthest extent of the harassment zone in the Long Island Sound was used to determine the incidental take estimate within that zone.

The harassment zone used to calculate takes for cetaceans was from the notional pile points at Pier 10 or CWTA out to the mouth of the Thames River which only occurs during concurrent pile driving. Densities for seals were derived from the NMSDD (Navy, 2017). The NMSDD uses a combined density for harbor seal and gray seal for which the densities for each species were 0.049 per sq km in the Thames River and 0.070 per sq km in Long Island Sound, just south of the mouth of the Thames River. Harp seals are typically very rare in the Thames River but regularly occur in Long Island Sound. A density of 0.287 per sq km for harp seals was used for Long Island Sound (Navy, 2017). In order to guard against unauthorized take of harp seals in the Thames River, it was

assumed that one harp seal may be present during pile installation activities that occur from January through May (Navy, 2019a).

Common Dolphin

Monthly surveys conducted in the Thames River from 2017 through 2019 did not record presence of common dolphin (Tetra Tech, 2020). As mentioned for Atlantic white-sided dolphin, an assumed juvenile dolphin (species was not determined) was observed swimming in the Thames River (specifically near Norwich Marina) in July 2022. Other surveys, observations, and reports have been specific to areas adjacent to, but not including the Thames River (Hayes *et al.*, 2024; Kenney and Vigness-Raposa, 2010; Jefferson *et al.*, 2009). Dolphins occur occasionally in Long Island Sound. Historic sightings of pods of dolphins in Long Island Sound date back to pre-World War II but have become increasingly rare (Durham, 2009). Common dolphins are more likely to occur from the mouth of the Thames River south into Long Island Sound. They are most common in the Gulf of Maine from July to October (Hayes *et al.*, 2024), and this is the timeframe they are likely to occur in Long Island Sound.

The average density for common dolphin in Long Island Sound (0.15 per sq km) was used for the sake of being conservative. This density was used to determine abundance of animals that could be present in the area for exposure, using the equation $\text{abundance} = n * \text{harassment zone}$. The average group size for common dolphin is 30 (NUWDC, 2024). Only concurrent pile driving activities would generate a harassment zone that extends to the mouth of the Thames River into Long Island Sound. To calculate takes of common dolphin during concurrent pile driving, the full harassment zone portion from the notional piles out to the mouth of the Thames River was used.

No take by Level A or Level B harassment of common dolphin was estimated per calculations for individual pile driving/extracting or drilling activities. As previously stated, common dolphins are not expected to be present in the river, particularly within

potential Level A harassment zones which would be a maximum of 10 meters. In addition, the furthest extent of the Level B harassment zone from pile/drilling activity ends in the Thames River, approximately 2 miles (3.2 km) north of Long Island Sound and thus, this species is not expected to be exposed to take by Level B harassment.

During concurrent activities, NMFS concurs with the Navy's determination that there would be no take by Level A harassment. However, there is the potential of Level B harassment exposure during approximately 3 days in December when concurrent activities may occur and when the Level B harassment zone would extend into the mouth of the Thames River. Calculated take estimates resulted in up to two takes by Level B harassment of common dolphin during concurrent activities. It is anticipated that should a pod of common dolphins be present, there could be up to 30 takes by Level B harassment. Because this species' regular occurrence is in much deeper waters of Long Island Sound than the extent of the harassment zone to the mouth of the Thames River (Hayes *et al.*, 2024), takes of this species are extremely low. However, to guard against unauthorized take, take by Level B harassment of common dolphins is requested at the group size of up to 30 individuals (NUWCD, 2024).

Harbor Porpoise

Monthly surveys conducted in the Thames River from 2017 through 2019 did not record presence of harbor porpoise (Tetra Tech, 2020). As discussed above for dolphins, other surveys, reports, and studies have been specific to areas adjacent to but not including the Thames River (Hayes *et al.*, 2024; Kenney and Vigness-Raposa, 2010; Jefferson *et al.*, 2009), and thus data for potential occurrence of harbor porpoise in the Thames River is limited. Porpoises occur occasionally in Long Island Sound. Historic sightings of pods of porpoises in Long Island Sound date back to pre-World War II but have become increasingly rare (Durham, 2009). Harbor porpoises are more likely to occur from the mouth of the Thames River into Long Island Sound. Peak abundance of

harbor porpoise in Long Island Sound is expected to be in December (Northeast Ocean Data, 2023).

The average density for harbor porpoise in Long Island Sound (0.32 per sq km) was used for the sake of being conservative. This density was used to determine abundance of animals that could be present in the area for exposure, using the equation $\text{abundance} = n * \text{harassment zone}$. Only concurrent pile driving activities would generate a harassment zone that extends to the mouth of the Thames River into Long Island Sound. To calculate takes of harbor porpoise during concurrent pile driving, the full harassment zone from the notional piles to the mouth of the Thames River was used.

No take by Level A or Level B harassment of harbor porpoise was estimated per calculations for individual pile driving/extracting or rotary drilling activities. Harbor porpoise are not expected to be present in the river, particularly within the potential Level A harassment zone which would be a maximum of 45.2 meters. In addition, the furthest extent of the Level B harassment zone from pile/drilling activity ends in the Thames River, approximately 2 miles (3.2 km) north of Long Island Sound and thus this species is not expected to be exposed to take by Level B harassment. During concurrent activities, NMFS concurs with the Navy's determination that there would be no Level A harassment takes. However, calculated take estimates resulted in up to five takes by Level B harassment.

Harbor Seal

Harbor seals may be present September to late May in the project vicinity and in the Thames River in general. A total of 12 individual sightings of harbor seals were recorded during monthly surveys over a 3-year period (Tetra Tech, 2020). No seals were observed on shore (Tetra Tech, 2020), and there are no haul-out areas within the Thames River (Navy, 2018). During marine mammal monitoring for Pier 32 construction

activities that occurred from May 2022 through December 2022, only one harbor seal was recorded (Navy, 2023). Harbor seals also occur within Long Island Sound (Hayes *et al.*, 2022).

Two different densities were used to calculate takes of harbor seals. A density of 0.049 per sq km was used in the Thames River and a density of 0.070 per sq km was used in Long Island Sound (Navy, 2017). These densities were used to determine abundance of animals that could be present in the area of exposure, using the equation $\text{abundance} = n * \text{harassment zone}$. Based on the Navy's calculations, NMFS concurs with the determination that there would be no Level A harassment takes of harbor seal but up to five Level B harassment takes during individual pile driving/extracting and drilling activities. During concurrent activities, of which the Long Island Sound density was used, NMFS concurs with the Navy that there would be no Level A harassment takes and there would be one Level B harassment take. Takes during concurrent activities would potentially occur over approximately 3 days in December.

Gray Seal

Gray seals may be present March through June in the project vicinity and the Thames River in general, although at lower abundance than harbor seals (Tetra Tech, 2020). Gray seals also occur within Long Island Sound (Hayes *et al.*, 2024).

Densities used to calculate takes for gray seal are the same as described above for harbor seal per the NMSDD (Navy, 2017). These densities were used to determine abundance of animals that could be present in the area of exposure, using the equation $\text{abundance} = n * \text{harassment zone}$. It was preliminarily determined that there would be no Level A harassment takes of gray seal but up to five Level B harassment takes of gray seal during individual pile driving/extracting and drilling activities. During concurrent activities, of which the Long Island Sound density was used, NMFS concurs with the preliminarily determination that there would be no Level A harassment takes, and there

would be one Level B take. Takes during concurrent activities would potentially occur over 3 days in December.

Harp Seal

Harp seals may be present in the project vicinity January through May. In general, harp seals are much rarer than the harbor seal and gray seal in the Thames River and were not observed during previous years surveys (Tetra Tech, 2020). However, two harp seals were identified in March and one harp seal in April 2019 by Mystic Aquarium staff. On both occasions they were hauled-out on the finger piers of the marina at SUBASE (Navy, 2019a).

The density used for calculating takes of harp seal in the harassment zone that extends from the mouth of the Thames River south into Long Island Sound is 0.287 per sq km (Navy, 2017). This density was used to determine abundance of animals that could be present in the area for exposure during concurrent activities, using the equation $abundance = n * harassment\ zone$. A density for harp seals in the Thames River was not available due to their rare occurrence. To guard against unauthorized take, take estimates include up to one Level B harassment take per month when this species may be present (January through May) (Navy, 2019a). This take estimate results in two Level B harassment takes during individual pile driving/extraction and drilling activities. For concurrent activities, using the Long Island Sound density of 0.287 per sq km, up to four Level B harassment takes of harp seal may occur during 3 days in the month of December.

Table 11 -- Estimated Takes by Level A and Level B Harassment

Common name	Stock	Stock abundance	Level A harassment	Level B harassment	Total proposed take	Proposed take as a percentage of stock
Common dolphin	Western North Atlantic	93100	0	30 ⁽²⁾	30	0.03

Harbor porpoise	Gulf of Maine/Bay of Fundy	85,765	0	5	5	0.01
Harbor seal	Western North Atlantic	61,336	0	6	6	0.01
Gray seal	Western North Atlantic	27,911	0	6	6	0.02
Harp seal ⁽¹⁾	Western North Atlantic	7,600,000	0	6	6	0.00

1. Harp seal incidental takes are calculated for concurrent activities that would extend to the mouth of the Thames River at Long Island Sound. For individual activities in the Thames River, harp seals are not usually present, but the Navy is requesting one Level B harassment take per month of pile activity when this species may occur (January through May).

2. Take increased to average group size for common dolphins for concurrent activities where the sound will reach the mouth of the Thames River (NMFS, 2023; NUWCD, 2024).

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 the activity, and other means of effecting the least practicable impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stock for taking for certain subsistence uses. 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 the 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, NMFS considers 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, as well as subsistence uses. 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 requirements described in the following were proposed by Navy in its adequate and complete application or are the result of subsequent coordination between NMFS and Navy. Navy has agreed that all of the mitigation measures are practicable. NMFS has fully reviewed the specified activities and the mitigation measures to determine if the mitigation measures would result in the least practicable adverse impact on marine mammals and their habitat, as required by the MMPA, and has determined the proposed measures are appropriate. NMFS describes these below as proposed mitigation requirements and has included them in the proposed IHA.

The Navy, as the responsible named party and the Navy of the proposed IHA, must ensure that construction supervisors and crews, the monitoring team, and relevant staff are trained prior to the start of all pile driving and drilling activity, so that responsibilities, communication procedures, monitoring protocols, and operational procedures are clearly understood. New personnel joining during the project must be trained prior to commencing work.

In addition to the measures described later in the **Proposed Monitoring and Reporting** section and all mitigation measures described in the Navy's Marine Mammal Monitoring Plan, the following mitigation measures would also apply to the in-water construction activities.

- *Implementation/Coordination* —Qualified, trained Protected Species Observers (PSOs) would implement mitigation measures. PSOs would be located on-site

before, during, and after permitted activities to monitor marine mammals within (and approaching) mitigation zones. PSOs would be in constant contact with the construction personnel to implement appropriate mitigation measures.

Briefings must be conducted between construction supervisors and crews and the marine mammal monitoring team before the start of all pile driving/extraction/drilling activities and when new personnel join the work to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures.

- *Establishment of Shutdown Zones* —Shutdown zones for all pile driving and removal activities can be found in table 12. A shutdown zone generally defines an area where the activity would shut down upon sighting a marine mammal (or anticipating an animal to enter the defined area). Shutdown zones would vary based on the activity type and marine mammal hearing group (table 3). The largest applicable shutdown zone size would be set for the project area during the activities if more than one construction method is occurring at that time. This will determine the appropriate Level A harassment isopleths and associated shutdown zones.
- If a marine mammal enters or is observed within an established shutdown zone, pile driving must be halted or delayed. Pile driving may not commence or resume until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone, or 15 minutes have passed without subsequent detections.
- **Table 12 – Proposed Shutdown and Level B Harassment Monitoring and Shutdown Zones by Activity**

Pile type, Size, and Driving method, Location	Level A (AUD INJ Onset) Monitoring/Shutdown Distance (Seals) ⁽¹⁾	Level A (AUD INJ Onset) Monitoring/Shutdown Distance (Cetaceans) ^(1,2)	Level B (Behavioral) Monitoring Distance for Marine Mammals
Pier 10 Demolition and Quay Wall Repair			
Vibratory Extract HP14x89 steel fender H-piles	35 meters	25 meters	3,415 meters

Vibratory Extract 24-inch concrete-encased steel H-piles	30 meters	20 meters	6,310 meters
Vibratory Extract 24-inch cast-in-place reinforced concrete piles	30 meters	20 meters	6,310 meters
Impact Install 16-inch polymeric fender piles with H-pile extension	30 meters	45 meters	22 meters
CWTA Demolition and Construction			
Vibratory Extract HP14 steel fender H-piles	30 meters	20 meters	3,415 meters
Rock socket (rotary) drill 30-inch x 100-ft concrete-filled steel pipe piles	10 meters	10 meters	1,848 meters
Rock socket (rotary) drill 16-inch fiberglass reinforced plastic fender piles	10 meters	10 meters	1,848 meters
Concurrent Activities			
Concurrent Pile Driving (2.5 days) of vibratory extraction of HP14x89 steel H-piles from Pier 10, Vibratory extraction of HP14 steel fender H-piles from CWTA, Rock socket (rotary) drilling of 30-inch x 100-ft concrete-filled steel pipe for CWTA construction.	From Pier 10: 90 meters From CWTA: 10 meters	From Pier 10: 60 meters From CWTA: 10 meters	Maximum harassment zone ⁽³⁾

1. Level A shutdown distance encompasses the maximum Level A harassment distance to avoid injury.

2. Although cetaceans are not anticipated to be in the river, because of a rare but recent observation of a dolphin in 2022, monitoring of the Level A harassment shutdown zones for cetaceans is included to guard against unauthorized incidental take of dolphins.

3. Harassment zone would be a maximum distance of 8,577 meters but would be truncated at intersecting land masses and would encompass a maximum area of 4.57 sq km.

- *PSOs* — the Navy must employ PSOs who would monitor the project area to the

maximum extent possible based on the required number of PSOs, required

monitoring locations, and environmental conditions. The number, placement, and

qualifications of PSOs during all drilling and pile driving and removal activities

(described in detail in the **Proposed Monitoring and Reporting** section) would

ensure that the entire shutdown zone is visible during pile installation. Visual

monitoring would be conducted by up to five PSOs depending on the pile activity.

- *Pre-activity Monitoring* — Before starting daily in-water construction activity, or

whenever a break in pile driving/removal of 30 minutes or longer occurs, PSOs

would observe the shutdown and monitoring zones for 30 minutes. The shutdown

zone would be considered cleared when a marine mammal has not been observed

within the zone for those 30 minutes. If a marine mammal is observed within the shutdown zone, a soft-start cannot proceed until the animal has left the zone or has not been observed for 15 minutes. When a marine mammal for which take is authorized is present in the harassment zone, activities may begin. If work ceases for more than 30 minutes, the pre-activity monitoring of the shutdown zones would commence.

- *Soft Start* —Soft-start procedures are believed to provide additional protection to marine mammals by warning and/or giving marine mammals a chance to leave the area before the hammer operates at full capacity. For impact pile driving, The Navy must provide an initial set of strikes from the hammer at reduced energy, followed by a 30-second waiting period. This procedure would be conducted three times before impact pile driving begins. Soft start would be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for 30 minutes or longer.
- All personnel, including construction supervisors and crews, PSOs, and relevant staff, must avoid direct physical interaction with marine mammals during construction activity. If a marine mammal comes within 10 m of such activity, operations must cease, and vessels must reduce speed to the minimum level required to maintain steerage and safe working conditions, as necessary to avoid direct physical interaction.
- For those marine mammals for which take has not been authorized, in-water drilling and pile installation and removal would shut down immediately if such species are observed within or entering the Level A or Level B harassment zone.

Protected Species Observers

The placement of PSOs during all pile driving and removal activities (described in detail in the **Proposed Monitoring and Reporting** section; see figure 11-1 in the

application) will ensure that the Thames River and portion of the Long Island Sound is visible during the relevant specified activities to the maximum extent practicable.

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

Proposed Monitoring and Reporting

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 would 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 while conducting the activities. Effective reporting is critical to compliance and ensuring 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 the: (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 activity; 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.

The monitoring and reporting requirements described in the following were proposed by the Navy in its adequate and complete application and/or are the result of subsequent coordination between NMFS and Navy. The Navy has agreed to the requirements. NMFS describes these below as requirements and has included them in the proposed IHA.

Visual Monitoring

Qualified, NMFS-approved PSOs must conduct monitoring in accordance with project's Marine Mammal Monitoring Plan. PSOs would be independent of the activity contractor (for example, employed by a subcontractor) and have no other assigned tasks during monitoring periods. At least one PSO would have prior experience performing the duties of a PSO during an activity pursuant to a NMFS-issued ITA. Other PSOs may substitute other relevant experience, education (degree in biological science or related field), or training for prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued ITA. PSOs would be present during all pile installation and removal activities, including vibratory, impact, and drilling methods, in accordance with the following:

- Observer training must be provided before the project starts and must include instruction on species identification (sufficient to distinguish the species in the

project area), description and categorization of observed behaviors, and interpretation of behaviors that may be construed as being reactions to the specified activity, proper completion of data forms, and other basic components of biological monitoring, including tracking of observed animals or groups of animals such that repeat sound exposures may be attributed to individuals (to the extent possible).

- All PSOs must have no other project-related tasks while conducting monitoring.
- PSOs shall be placed at the best vantage point(s) practicable to monitor for marine mammals and implement shutdown or delay procedures when applicable through communication with the equipment operator.
- Monitoring would be conducted 30 minutes before, during, and 30 minutes after drilling and pile driving/removal activities. In addition, observers shall record all incidents of marine mammal occurrence, regardless of distance from activity, and must document any behavioral reactions in concert with the distance from piles being driven or removed. Drilling and pile driving/removal activities- include the time to install or remove a single pile or series of piles- as long as the time elapsed between uses of the pile driving equipment is no more than 30 minutes.
- At least five PSOs would be on duty during all vibratory installation/removal, impact installation/removal, and drilling. PSOs would be stationed at locations that provide optimal visual coverage for shutdown and monitoring zones. One PSO would be stationed on land-based features (such as Pier 10 or CWTA) or a construction barge, and four PSOs would monitor from two boats for the larger monitoring zones. PSOs would monitor for marine mammals entering the Level B harassment zones; the position(s) may vary based on the construction activity and the location of piles or equipment. To maximize the visual coverage of shutdown and monitoring zones, observers would use elevated platforms at observation

points to the extent practicable. Observers would contact each other via two-way radio and a cellular phone used as backup communication.

- PSOs would scan the waters using binoculars and/or spotting scopes and/or the naked eye and a handheld range-finder device to verify the distance to each sighting from the project site.

Additionally, PSOs should meet the following qualifications:

- Have the 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 prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates and times when in-water construction activities were suspended to avoid potential incidental injury from construction sound of marine mammals observed 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.

Hydroacoustic Monitoring

The Navy proposes to implement in situ acoustic monitoring efforts to measure SPLs from in-water activities. The Navy would collect and evaluate sound levels during construction and demolition activities. Hydroacoustic monitoring would be successfully conducted for at least 10 percent or up to 10 of each different type of pile and each

method of installation. For the pile driving/extraction and rock socket drilling events acoustically measured, 100 percent of the data would be analyzed. The Navy would submit a detailed acoustic monitoring plan to NMFS no later than 60 days in advance of the start of in-water work for approval of proposed methodologies.

At a minimum, the methodology would include a stationary hydrophone system with the ability to measure SPLs placed in accordance with NMFS' most recent recommendations for the collection of source levels. Monitoring would occur at 33 feet (10 meters) from the noise; at a location within the Level A (AUD INJ onset) zones; and occasionally near the predicted harassment zones for Level B (Behavioral) harassment. The resulting data set would be analyzed to examine and confirm SPLs and rates of transmission loss for each separate in-water construction activity. With NMFS' concurrence, these metrics would be used to recalculate the limits of the shutdown, Level A (AUD INJ onset), and Level B (Behavioral) disturbance zones, and to make corresponding adjustments in marine mammal monitoring of these zones.

Environmental data would be collected, including but not limited to, the following: wind speed and direction, air temperature, humidity, surface water temperature, water depth, wave height, weather conditions, and other factors that could contribute to influencing the airborne and underwater sound levels (e.g., aircraft, boats, etc.). The chief inspector would supply the acoustics specialist with the substrate composition, hammer or drill model and size, hammer or drill energy settings and any changes to those settings during the piles being monitored, depth of the pile being driven or shaft excavated, and blows per foot for the piles monitored.

For acoustically monitored piles, data from the monitoring locations would be post-processed to obtain the following sound measures:

- Mean, median, minimum, and maximum RMS pressure level in [dB re 1 μ Pa];
- Mean, median, minimum, and maximum single strike SEL in [dB re μ Pa²s];

- Cumulative SEL as defined by the mean single strike SEL + $10 \cdot \log_{10}$ (number of hammer strikes) in [dB re $\mu\text{Pa}^2\text{s}$]; and
- A frequency spectrum (pressure spectral density) in dB re μPa^2 per Hz based on the average of up to eight successive strikes with similar sound. Spectral resolution would be 1 Hz, and the spectrum would cover nominal range from 7 Hz to 20 kHz.

Reporting

A draft marine mammal monitoring report would be submitted to NMFS within 90 days after the completion of drilling and pile driving and removal activities or 60 days before the requested date of issuance of any future IHAs for projects at the exact location, whichever comes first. The report would include an overall description of work completed, a narrative regarding marine mammal sightings, and associated PSO data sheets. Specifically, the report must include:

- Dates and times (beginning and end) of all marine mammal monitoring;
 - Construction activities occurring during each daily observation period, including the number and type of holes/piles driven or removed and by what method (*i.e.*, impact, vibratory, or drilling);
 - PSO locations during marine mammal monitoring; and
 - Environmental conditions during monitoring periods (at the beginning and end of a PSO shift and whenever conditions change significantly), including Beaufort sea state and any other relevant weather conditions, including cloud cover, fog, sun glare, and overall visibility to the horizon, and estimated observable distance.
- Upon observation of a marine mammal, the following information is required:

- The name of the PSO who sighted the animal(s), the PSO's location, and activity at the time of the sighting;
- The time of the sighting;

- Identification of the animal(s) (*e.g.*, genus/species, lowest possible taxonomic level, or unidentified), the PSO's confidence in identification, and the composition of the group if there is a mix of species;
- The distance and bearing of each marine mammal observed relative to the specified activity for each sighting (*e.g.*, if pile driving was occurring at the time of sighting);
- The estimated number of animals (min/max/best estimate);
- The estimated number of animals by cohort (adults, juveniles, neonates, group composition, sex class, *etc.*);
- The animal's closest point of approach and estimated time spent within the harassment zone;
- A description of any marine mammal behavioral observations (*e.g.*, observed behaviors such as feeding or traveling), including an assessment of behavioral responses thought to have resulted from the activity (*e.g.*, no response or changes in behavioral state such as ceasing feeding, changing direction, flushing, or breaching);
- The number of marine mammals detected within the harassment zones by species (differentiated by month as appropriate); and
- Detailed information about any implementation of any mitigation triggered (*e.g.*, shutdowns and delays), a description of specific actions that ensued, and the resulting changes in the behavior of the animal(s), if any.

Finally, The Navy must also submit all PSO datasheets and/or raw sighting data in an electronic tabular format with the draft report. If no comments are received from NMFS within 30 days, the draft report would constitute the final report. If comments are received, a final report addressing NMFS comments must be submitted within 30 days after receipt of comments.

Reporting Injured or Dead Marine Mammals

In the unanticipated event that the specified activity causes the take of a marine mammal in a manner prohibited by the IHA (if issued), such as an injury, serious injury, or mortality, The Navy must immediately cease the specified activities and report the incident to the NMFS Office of Protected Resources

(*PR.ITP.MonitoringReports@noaa.gov* and *ITP.hotchkin@noaa.gov*) and to the regional stranding coordinator as soon as feasible. The report must include the following information:

- Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
- Species identification (if known) or description of the animal(s) involved;
- Condition of the animal(s) (including carcass condition if the animal is dead);
- Observed behaviors of the animal(s), if alive;
- If available, photographs or video footage of the animal(s); and
- General circumstances under which the animal was discovered.

Activities would not resume until NMFS can review the circumstances surrounding the prohibited take. NMFS would work with the Navy to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. The Navy must not resume in-water construction activities until NMFS has notified them via letter, email, or telephone.

If the Navy discovers an injured or dead marine mammal, and the lead PSO determines that the cause of the injury or death is unknown and the death is relatively recent (*e.g.*, in less than a moderate state of decomposition as described in the next paragraph), then the Navy would immediately report the incident to the NMFS Office of Protected Resources (*PR.ITP.MonitoringReports@noaa.gov*) and to the regional stranding coordinator as soon as feasible. The report would include the same information

identified in the paragraph above. Activities would be able to continue while NMFS reviews the circumstances of the incident. NMFS would work with Navy to determine whether modifications in the activities are appropriate.

Finally, in the event that the Navy discovers an injured or dead marine mammal and the lead PSO determines that the injury or death is not associated with or related to the activities authorized in the IHA (*e.g.*, previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), the Navy would report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the NMFS Stranding Hotline and/or by email to the Regional Stranding Coordinator, within 24 hours of the discovery. The Navy would provide photographs, video footage (if available), or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be “taken” through harassment, NMFS considers other factors, such as the likely nature of any impacts or responses (*e.g.*, intensity, duration), the context of any impacts or responses (*e.g.*, critical reproductive time or location, foraging impacts affecting energetics), 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' 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 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).

To avoid repetition, the discussion of our analysis applies to all the species listed in table 11, given that the anticipated effects of this activity on these different marine mammal stocks are expected to be similar. There is little information about the nature or the severity of the impacts or the size, status, or structure of any of these species or stocks that would lead to a different analysis for this activity.

Pile driving, removal, and drilling activities associated with the project, as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take in the form of Level B harassment from underwater sounds generated from drilling and pile driving and removal. Potential takes could occur if individuals of these species are present in zones ensounded above the thresholds for Level A or Level B harassment identified above when these activities are underway.

Given the nature of the activity, NMFS does not anticipate serious injury or mortality due to the proposed project, even in the absence of required mitigation. The Level A harassment zones identified in table 10 are based upon an animal exposed to vibratory pile driving, impact pile driving, and drilling for periods ranging from up to a few minutes to several hours (not exceeding daylight hours). Exposures of this length are, however, unlikely for pile installation and removal scenarios, given marine mammal movement throughout the area.

As stated in the Proposed Mitigation section, the Navy would implement shutdown zones that equal or exceed many of the Level A harassment isopleths shown in

table 10. As noted previously, some subset of the individuals that are behaviorally harassed could also simultaneously incur some small degree of TTS for a short duration of time. Because of the small degree anticipated, any TTS potentially incurred here is not expected to adversely impact individual fitness, let alone annual rates of recruitment or survival.

For all species and stocks, take is expected to occur within a limited, confined area (adjacent to the project site) of the stock's range. The intensity and duration of take by Level B harassment would be minimized through the mitigation measures described herein. Further, the amount of take authorized is small compared to the stock abundance.

Behavioral responses of marine mammals to pile driving, pile removal, and drilling at the project site, if any, are expected to be mild, short-term, and temporary. Given that the specified activities that could result in take would occur over 10 months, any harassment would be temporary and intermittent. Effects on individuals that are taken by Level B harassment, based on reports in the literature as well as monitoring from other similar activities, would 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; Henningson, Durham, and Richardson, Inc. (HDR) 2012; ABR 2016). Most likely, for pile driving, individuals would move away from the sound source and be temporarily displaced from the areas of pile driving. However, this reaction has been observed primarily associated with impact pile driving. While vibratory driving associated with the proposed project may produce sound at distances of many kilometers from the project site, thus overlapping with some likely less-disturbed habitat, the project site itself is located in a busy harbor, and the majority of sound fields produced by the specified activities are close to the harbor. Animals disturbed by project sounds would be expected to avoid the area and use nearby higher-quality habitats.

The potential for harassment is minimized by implementing the proposed mitigation measures. During all impact driving, implementation of soft start procedures and monitoring of established shutdown zones shall be required, significantly reducing any possibility of injury. Given sufficient notice through soft start (for impact driving), marine mammals are expected to move away from an irritating sound source before it becomes potentially injurious.

Any effects on marine mammal prey during in-water construction would have a short-term impact on individual marine mammals' foraging and likely no effect on the populations of marine mammals. Indirect effects on marine mammal prey during the construction are expected to be minor, and these effects are unlikely to cause substantial effects on marine mammals at the individual level, with no expected impact on annual rates of recruitment or survival.

The area likely impacted by the project is relatively small compared to the available habitat in the surrounding waters, noise impacts do not overlap any known Biologically Important Areas (BIAs) for any of the species likely to occur (Van Parijs *et al.* 2015), and there is no marine mammal ESA-designated critical habitat in the project area. 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 any of the species or stocks through effects on annual rates of recruitment or survival:

- No serious injury or mortality is anticipated or proposed for authorization;
- No takes by Level A harassment are anticipated or proposed for authorization;
- The anticipated incidents of Level B harassment would consist of, at worst, temporary modifications in behavior that would not result in fitness impacts to individuals;

- The area affected by the specified activity is very small relative to the overall habitat ranges of all species, does not include any rookeries, does not include ESA-designated critical habitat, and does not include any known BIAs for any of the species for which take is proposed to be authorized;
- The project area is located in an industrialized and commercial portion of the river; and
- The proposed mitigation measures are expected to reduce the effects of the specified activity to the least practicable adverse impact level.

In combination, we believe that these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activities would have only minor, short-term effects on individuals. The specified activities are not expected to affect the reproduction or survival of any individual marine mammal and, therefore, would not affect the recruitment or survival rates for any species or stock.

Based on the analysis of the likely effects of the specified activity on marine mammals and their habitat and considering the implementation of the proposed monitoring and mitigation measures, NMFS preliminarily finds that the total number of marine mammals taken from the proposed activity would have a negligible impact on all affected species or stocks.

Small Numbers

As noted previously, only take of small numbers of marine mammals 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. When the predicted number of individuals to be taken is less than one-third of the species or stock abundance, the take is considered to be of small numbers. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

Table 11 demonstrates the number of animals that could be exposed to the received noise levels that could cause takes by harassment for the proposed work. Our analysis shows that less than one-third of each affected stock could be taken by harassment. The number of animals proposed to be taken for these stocks would be considered small relative to the relevant stock's abundances, even if each estimated taking occurred to a new individual—an extremely unlikely scenario.

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 would be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

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

Endangered Species Act

Section 7(a)(2) of the ESA of 1973 (16 U.S.C. 1531 *et seq.*) requires that each Federal agency ensure 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 issuing IHAs, NMFS consults internally whenever we propose to authorize take for endangered or threatened species. No incidental take of ESA-listed

species is proposed to be authorized or expected to result from this activity. Therefore, NMFS has determined that consultation under section 7 of the ESA is not required for this action.

Proposed Authorization

As a result of these preliminary determinations, NMFS proposes to issue an IHA to the applicant for conducting the proposed project between August 1, 2026, and July 31, 2027, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. A draft of the proposed IHA can be found at:

<https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities>.

Request for Public Comments

We request comments on our analyses, the proposed authorization, and any other aspect of this notice of proposed IHA for the proposed project. We also request comments on the potential renewal of this proposed IHA, as described in the paragraph below. Please include any supporting data or literature citations with your comments to help inform decisions on the request for this IHA or a subsequent renewal IHA.

On a case-by-case basis, NMFS may issue a one-time, 1-year renewal IHA following notice to the public providing an additional 15 days for public comments when (1) up to another year of identical or nearly identical activities as described in the **Description of Proposed Activity** section of this notice is planned, or (2) the activities as described in the **Description of Proposed Activity** section of this notice would not be completed by the time the IHA expires and 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 before the needed renewal IHA effective date (recognizing that the renewal IHA expiration date cannot extend beyond 1 year from the expiration of the initial IHA).

- The request for renewal must include the following:

(1) An explanation that the activities to be conducted under the requested renewal IHA 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).

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

Dated: February 23, 2026.

Kimberly Damon-Randall,

Director, Office of Protected Resources,

National Marine Fisheries Service.